

PHILADELPHIA ELECTRIC COMPANY - ELECTRIC OPERATIONS
COMPARISON OF MONTHLY BILLS

RATE : HI HIGH TENSION POWER VS EP-S
DEMAND = 50000.0 KW

HRS USAGE	BASE RATE BILL				TOTAL BILL				BASE RATE BILL (EXCL. ALL FUEL)			
	EXISTING RATE	PROPOSED RATE	CHANGE \$	% CHANGE	EXISTING RATE	PROPOSED RATE	CHANGE \$	% CHANGE	EXISTING RATE	PROPOSED RATE	CHANGE \$	% CHANGE
0	268780.	888958.	620238.	230.8	284763.	941051.	656288.	230.5	268720.	888958.	620238.	230.8
10	305670.	907708.	602038.	197.0	322660.	959641.	636981.	197.4	291294.	897084.	605790.	208.0
20	342650.	926458.	583838.	170.4	360588.	978231.	617674.	171.3	313867.	905210.	591363.	189.4
30	379570.	945208.	565638.	149.0	398455.	996822.	598366.	150.2	336441.	913336.	576895.	171.5
40	416520.	963958.	547438.	131.4	436353.	1015412.	579059.	132.7	359014.	921462.	562448.	156.7
50	453470.	982708.	529238.	114.7	474250.	1034002.	559752.	118.0	381588.	929588.	548000.	143.6
60	490420.	1001458.	511038.	104.2	512148.	1052592.	540445.	105.5	404161.	937714.	533553.	132.0
70	527370.	1020208.	492838.	93.5	550045.	1071183.	521138.	94.7	426735.	945840.	519105.	121.6
80	564320.	1038958.	474638.	84.1	587942.	1089773.	501831.	85.4	449308.	953966.	504658.	112.3
90	601270.	1057708.	456438.	75.9	625840.	1108363.	482323.	77.1	471882.	962092.	490210.	103.9
100	638220.	1076458.	438238.	68.7	663737.	1126953.	463216.	69.8	494455.	970218.	475763.	96.2
150	822970.	1170208.	347238.	42.2	853224.	1219905.	366680.	43.0	607323.	1010848.	403525.	66.4
200	961970.	1263958.	301988.	31.4	994230.	1318856.	318626.	32.0	674440.	1051478.	377038.	55.9
250	1100971.	1357708.	256738.	23.3	1135236.	1408807.	270871.	23.8	741558.	1092108.	350550.	47.3
300	1239971.	1451458.	211487.	17.1	1276242.	1498758.	222517.	17.4	808676.	1132738.	324062.	40.1
400	1427971.	1638958.	210987.	14.8	1462880.	1648663.	221781.	15.2	882911.	1213998.	361087.	42.3
500	1615971.	1826458.	210487.	13.0	1649959.	1878563.	221044.	13.4	897146.	1295258.	398112.	44.4
600	1803971.	2013958.	209987.	11.6	1836158.	2056466.	220308.	12.0	941381.	1376518.	435137.	46.2
700	1991971.	2201458.	209487.	10.5	2022796.	2242368.	219572.	10.9	986616.	1457778.	472162.	47.9
730	2048371.	2287708.	209337.	10.2	2078788.	2298139.	219351.	10.6	998886.	1488256.	483270.	48.4

- Q.1 Provide a cost study which allocates the total cost of service to each proposed tariff rate schedule. Tariff rate may be combined for this purpose provided that they are of a similar supply or end use nature. A statement describing which rates were combined and the reasons therefore should be submitted.

The rates of return for each tariff rate schedule as defined above should be determined at both the present and proposed rate levels. Base rate revenues should be used for this purpose unless there are good and sufficient reasons to include revenues derived from other sources. Should the latter be the case, an explanation of other revenue sources included and reasons, therefore, should accompany the cost allocation study.

The methods selected for use in allocating costs to rate classes should include cost analyses based on:

- (a) Peak responsibility;
- (b) Average and excess (on a non-coincident demand basis); and
- (c) Company preferred method if different from the above-referenced methods, with rationale behind the selection.

This study should include a statement of the source and age of the load data used in the determination of demand responsibilities, a description of any special studies used to prepare the cost study, and the most recent overall system line loss study.

The cost data used in the allocation study may be based on the test year.

- A.1. The Testimony of W. F. Sundermeir and Exhibit WFS-1 provide all of the requested data.

Q.2 Provide comparisons in either graphical or tabular form showing cost (as defined in the cost of service study) and proposed base rate revenues and usage for all residential and demand/energy rate schedules. Demand shall be for representative loads for each demand/energy rate schedule.

A.2. The Testimony of W. F. Sundermeir and Exhibit WFS-1 provide all of the requested data.

R-850152

ORIGINAL

RECEIVED

SEP 27 1985

SECRETARY'S OFFICE
Public Utility Commission

PHILADELPHIA ELECTRIC COMPANY

BEFORE

PENNSYLVANIA PUBLIC UTILITY COMMISSION

INFORMATION SUBMITTED PURSUANT TO

SECTION 53.51 et seq OF THE COMMISSION'S REGULATIONS

VOLUME V - PLANT AND DEPRECIATION DATA

VOLUME VI - UNADJUSTED COMPARATIVE BALANCE SHEETS
AND INCOME STATEMENTS

SUPPLEMENT NO. 15

TO

TARIFF ELECTRIC - PA. P.U.C. NO. 26

ISSUED SEPTEMBER 27, 1985

EFFECTIVE NOVEMBER 27, 1985

DOCKETED

SEP 27 1985

[Handwritten signature]

Q.1. Provide schedules supporting claimed amounts for Electric Plant in Service by function and by account if available.

A.1. Pages B-3 through B-6 of Exhibits TPH-1 and TPH-2 provide claimed amounts for Electric Plant and Common Plant in service by function and by account. Additionally, the "C" Section of Exhibits TPH-1 and TPH-2 support claimed amounts by function, account and station where required.

Q.2. Provide a comparison of calculated depreciation reserve v. book reserve at the end of the test year. Provide this comparison by functional group and by account if available.

A.2. Pursuant to the Commission Order at R-842590, the Company's rate claim is based on use of the book depreciation reserve and remaining life depreciation method. Since calculated depreciation is no longer claimed by the Company, it has not been developed and is not available.

Additional discussion of the Company's annual depreciation claim and associated depreciation reserve together with a detailed discussion of the remaining life methodology is contained in the Direct Testimony of A. Wroblewski.

- Q.3. Provide supporting schedules which indicate the procedures and calculations employed to develop the original cost plant and applicable reserves to the test year end as submitted in the current proceeding.
- A.3. The original cost plant and applicable reserves to the test year end is developed in Company Exhibit AW-2 for the historic test year and Exhibit AW-3 for the future test year.

The plant cost development begins with the actual balances recorded on the Company's books as of 6/30/85. The plant balances are updated to the end of the future test year using budgeted additions, retirements and adjustment by plant accounts as indicated in Schedule II of the Exhibits noted.

The recorded book depreciation reserve as of 6/30/85 is updated to the end of the future test year using budgeted depreciation accruals, plant retirements, salvage and removal costs as indicated in Schedule IV of Exhibit AW-3.

The Direct Testimony of W. H. Smith explains the detailed internal accounting procedures utilized by the Company to ensure that the original cost of utility plant is properly recorded in the books of account. The Direct Testimony of A. J. Solecki provides detail supporting the Company's budget process and the Testimony of A. Wroblewski supports the reserve for depreciation.

Q.4. Provide a schedule showing details of rate case adjustments.

A.4. Page A-3 of Exhibits TPH-1 and TPH-2, provides for the historic and future test years respectively, a schedule summarizing all of the Company's claimed depreciation adjustments which impact revenues, expenses and taxes and which are detailed in the "D" Section of these same exhibits. Page A-2 of Exhibits TPH-1 and TPH-2 provide a summary of the Company's rate base claim together with references to the appropriate pages in the "B" and "C" sections of these same exhibits.

Q.1. Provide a comparison of calculated depreciation accruals v. book accruals by function and by account if available.

A.1. Pursuant to the Commission's Order at R-842590, the Company's rate claim is based on book depreciation.

Pages C-4 through C-5f of Exhibits TPH-1 and TPH-2 provide a summary of the Company's electric operations annual book accruals by account, station and function for the test years ended June 30, 1985 and June 30, 1986, respectively. Similar data for the Company's common plant is provided on pages C-6 through C-6b of these same exhibits.

- Q.2. Supply a schedule by account or by depreciable group showing the survivor curve or interim survivor curve and annual accrual rate estimated to be appropriate:
- a. for the purpose of this filing, and
 - b. for the purposes of the most recent rate filing prior to the current proceeding, and
 - c. supply an explanation for any major change in annual accrual rate by account or by depreciable group, and
 - d. supply a comprehensive statement of major changes made in depreciation methods, procedures and techniques and the effect of such changes upon accumulated and annual depreciation, if any.
- A.2.
- a. The requested data, for both the historic and future test years, appears in exhibits TPH-1 and TPH-2 respectively on pages C-5a through C-5f for electric plant and pages C-6a and C-6b for common plant. The supporting detail for these schedules is provided in Exhibits AW-1, AW-2, and AW-3. Additional discussion and explanation of the Company's annual and accrued depreciation is provided in the Direct Testimony of A. Wroblewski.
 - b. Attachment V-B-2 provides the requested data.
 - c. The depreciation rate for Cromby 1 and Eddystone 1 and 2 decreased from approximately 18.3% and 9.6% in the prior filing to 5.7% and 4.3%, respectively, in the current filing due to a 15 year life extension for these coal fired units. Other changes in depreciation rates are the result of changes in life estimates noted in Exhibit AW-1, 1985 Depreciation Study or changes in the remaining life due to age progression between life studies.
 - d. Consistent with the Commission's Order at R-842590, the Company is using the remaining life method in developing annual and accrued depreciation in this filing. The Direct Testimony of A. Wroblewski provides a comprehensive description of the Company's annual and accrued depreciation claim.

PHILADELPHIA ELECTRIC COMPANY SCHEDULE IX
 ANNUAL PROVISION FOR DEPRECIATION
 CLASS OF SERVICE: ELECTRIC
 YEAR: 1964

SYSTEM 3, REMAINING LIFE
 Book Depn.
 R102590

Replaces Pgs. C-11 through
 C-14 of Exp. TPR-2

04/18/64

DEPRECIABLE PLANT

LOCATION ACCOUNT	BALANCE 1/1	ADDITIONS	RETIREMENTS	ADJUSTMENTS	BALANCE 12/31	WHOLE LIFE RESERVE 12/31	12/31 NET PLANT	PLANT - RESERVE	LIFE	REMAIN. LIFE
INTANGIBLE PLANT										
601	162934.121	0.0	0.0	0.0	162934.121	0.0	0.0	0.0	0.0	0.0
STATION TOTAL	162934.121	0.0	0.0	0.0	162934.121	0.0	0.0	0.0	0.0	0.0

STATION TOTAL	BALANCE 1/1	ADDITIONS	RETIREMENTS	ADJUSTMENTS	BALANCE 12/31	WHOLE LIFE RESERVE 12/31	12/31 NET PLANT	PLANT - RESERVE	LIFE	REMAIN. LIFE
1	295740.651	0.0	0.0	0.0	295740.651	0.0	295740.651	0.0	0.0	0.0
1	12269061.871	400232.001	90000.0	0.0	12567227.871	695750.691	5631514.501	13.415	759471.091	0.0
1	42051440.351	1341320.001	27000.0	0.0	44165796.351	20000005.901	16165790.371	13.541	2109065.321	0.0
1	10306607.351	275501.001	3000.0	0.0	10581268.351	4954844.991	3627203.361	13.507	492010.931	0.0
1	10091984.821	195052.001	3000.0	0.0	10284038.821	9429413.251	85742.971	13.567	116495.421	0.0
1	2174707.331	0.0	0.0	0.0	2174707.331	769649.491	425057.841	13.470	57208.371	0.0
STATION TOTAL	76991631.171	2220993.001	221000.001	0.0	79091624.171	52000092.401	27002731.771	13.521	3611131.931	0.0

STATION TOTAL	BALANCE 1/1	ADDITIONS	RETIREMENTS	ADJUSTMENTS	BALANCE 12/31	WHOLE LIFE RESERVE 12/31	12/31 NET PLANT	PLANT - RESERVE	LIFE	REMAIN. LIFE
6	2400255.541	0.0	0.0	0.0	2400255.541	0.0	2400255.541	0.0	0.0	0.0
6	62910542.731	1322227.001	0.0	0.0	64232769.731	2159100.041	42603468.691	9.534	4070276.141	0.0
6	100475902.161	13767667.001	0.0	0.0	101842669.161	74951631.691	827291337.471	9.674	12313652.131	0.0
6	42010164.501	700333.001	104000.0	0.0	43421297.501	27770790.591	15442507.221	9.715	151936.131	0.0
6	27007200.391	702100.001	0.0	0.0	27805300.391	10010644.101	17066602.221	9.451	1647193.001	0.0
6	2490521.641	404132.001	0.0	0.0	2497453.641	160095.621	1373698.821	9.551	131004.921	0.0
STATION TOTAL	326110674.961	16360777.001	104000.001	0.0	342335551.961	135009162.641	206476209.321	9.445	19682562.301	0.0

STATION TOTAL	BALANCE 1/1	ADDITIONS	RETIREMENTS	ADJUSTMENTS	BALANCE 12/31	WHOLE LIFE RESERVE 12/31	12/31 NET PLANT	PLANT - RESERVE	LIFE	REMAIN. LIFE
7	55349.541	0.0	0.0	0.0	55349.541	0.0	55349.541	0.0	0.0	0.0
7	36206423.531	5030175.001	0.0	0.0	41236598.531	12020000.741	29202509.791	10.191	5326769.731	0.0
7	73740443.031	4421491.001	20000.0	0.0	76133004.031	31710613.591	44423571.821	10.334	6511337.531	0.0
7	17030905.561	460050.001	12000.0	0.0	18251005.561	10067412.561	12666006.341	10.375	1035636.601	0.0
7	7025100.651	266170.001	3600.0	0.0	7288370.651	5287270.171	2001000.401	10.344	513030.651	0.0
7	120191.141	1031794.001	0.0	0.0	1331095.141	947335.391	406561.701	10.275	73933.131	0.0
STATION TOTAL	136900574.231	11010344.001	43000.001	0.0	147995910.231	63353992.231	84601926.091	10.207	15461515.721	0.0

STATION TOTAL	BALANCE 1/1	ADDITIONS	RETIREMENTS	ADJUSTMENTS	BALANCE 12/31	WHOLE LIFE RESERVE 12/31	12/31 NET PLANT	PLANT - RESERVE	LIFE	REMAIN. LIFE
8	0.061	0.0	0.0	0.0	0.061	0.0	0.061	0.0	0.0	0.0
8	3110	0.0	0.0	0.0	3110	0.0	3110	0.0	0.0	0.0
8	3120	0.0	0.0	0.0	3120	0.0	3120	0.0	0.0	0.0
8	3140	0.0	0.0	0.0	3140	0.0	3140	0.0	0.0	0.0
8	3150	0.0	0.0	0.0	3150	0.0	3150	0.0	0.0	0.0
8	3160	0.0	0.0	0.0	3160	0.0	3160	0.0	0.0	0.0
STATION TOTAL	0.001	0.0	0.0	0.0	0.001	0.0	0.001	0.0	0.0	0.0

STATION TOTAL	BALANCE 1/1	ADDITIONS	RETIREMENTS	ADJUSTMENTS	BALANCE 12/31	WHOLE LIFE RESERVE 12/31	12/31 NET PLANT	PLANT - RESERVE	LIFE	REMAIN. LIFE
9	1353562.041	0.0	0.0	0.0	1353562.041	0.0	1353562.041	0.0	0.0	0.0
9	1655926.421	599035.001	0.0	0.0	2254961.421	0.0	2254961.421	0.0	0.0	0.0
9	25902349.071	1529926.001	10000.0	0.0	27432275.071	819473.751	26622801.321	20.714	2574327.501	0.0
9	1104502.601	445757.001	10000.0	0.0	1547727.601	17672176.551	15909093.521	20.006	2064222.141	0.0
9	10044100.021	142790.001	0.0	0.0	10187090.021	3095930.901	2001195.521	20.662	491273.241	0.0
9	1639900.071	376607.001	2000.0	0.0	2015507.071	0105775.301	2001195.521	20.662	577506.041	0.0
STATION TOTAL	65551495.021	3094095.001	22000.001	0.0	68662590.021	43646037.931	26176752.091	20.770	7141631.931	0.0

PHILADELPHIA ELECTRIC COMPANY SCHEDULE II
 ANNUAL PROVISION FOR DEPRECIATION
 CLASS OF SERVICE: ELECTRIC
 YEAR: 1964

SYSTEM 3, REMAINING LIFE
 RIN2590

66/13/64

DEPRECIABLE PLANT

LOCATION ACCOUNT	BALANCE 1/1	ADDITIONS	RETIREMENTS	ADJUSTMENTS	BALANCE 12/31	INOLE LIFE 12/31	NET PLIN. LIFE	RESERVE 12/31	PLANT - RESRVD.	RATE	ACCUM. LIFE
STEAM PRODUCTION											
71	43337021.101	10622.001	0.1	4526043.161	45263132.161	10915050.031	3635293.071	19297667.201	65033032.971	4.261	1406912.921
71	041004109.251	266311.001	0.1	64330500.231	642173344.751	19297667.201	65033032.971	71289000.791	20263000.521	4.2271	2761410.211
71	27191942.311	396055.001	4000.1	27303997.311	27207969.011	4302030.401	176647919.361	535394.261	1909029.441	4.1351	856432.541
71	21939411.041	91394.001	0.1	22030807.841	21905109.041	4302030.401	176647919.361	535394.261	1909029.441	4.1351	745931.981
71	2515227.941	9194.001	0.1	2524423.941	2519029.941	4225700.061	139205303.501	4225700.061	139205303.501	4.2011	62244.431
STATION TOTAL	101000592.441	833506.001	4000.001	101350172.441	101273302.441	4225700.061	139205303.501	4225700.061	139205303.501	4.2011	5050932.001
STEAM PRODUCTION											
72	0.0	0.0	0.1	260000.1	260000.001	0.0	1922000.001	0.0	1922000.001	3.7021	72690.201
72	51044044.351	227313.001	0.1	1269000.1	52521135.351	9006192.931	42714962.421	3996029.421	12735454.751	3.9111	1670504.121
72	20000429.371	194055.001	2000.1	530000.1	21132404.371	20770454.871	3996029.421	1133642.291	1309370.601	3.9101	670236.731
72	2133424.951	91394.001	0.1	220000.1	2443020.951	34000.001	94000.001	34000.001	94000.001	3.0231	51201.371
72	0.0	0.0	0.1	120000.001	64000.001	0.0	0.0	0.0	0.0	0.0	3593.701
STATION TOTAL	73504090.671	514762.001	2000.001	4735000.001	70032660.671	15656664.041	63175995.031	15656664.041	63175995.031	3.9201	2476310.201
STEAM PRODUCTION											
305	10602326.231	-10602326.231	0.1	0.0	0.0	0.0	0.0	0.0	0.0	1.0251	0.0
305	36050704.501	-36050704.501	0.1	0.0	0.0	0.0	0.0	0.0	0.0	1.4761	0.0
305	4415677.091	-4415677.091	0.1	0.0	0.0	0.0	0.0	0.0	0.0	1.1011	0.0
STATION TOTAL	55060700.701	-55060700.701	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
STEAM PRODUCTION											
306	1904912.511	0.0	0.1	1904912.511	1904912.511	-3179059.971	5164772.401	-3179059.971	5164772.401	1.0251	52949.771
306	0.0	0.0	0.1	0.0	0.0	-0.001	0.001	-0.001	0.001	0.0	0.0
306	0.0	0.0	0.1	0.0	0.0	-0.001	0.001	-0.001	0.001	0.0	0.0
STATION TOTAL	1904912.511	0.0	0.0	1904912.511	1904912.511	-3179059.971	5164772.401	-3179059.971	5164772.401	1.0251	52949.771
STEAM PRODUCTION											
320	-0.001	0.0	0.1	-0.001	-0.001	0.0	0.0	0.0	0.0	0.0	0.0
320	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
320	-0.001	0.0	0.1	-0.001	-0.001	0.0	0.0	0.0	0.0	0.0	0.0
320	0.0	0.0	0.1	0.0	0.0	-0.001	0.001	-0.001	0.001	0.0	0.0
STATION TOTAL	-0.001	0.0	0.0	-0.001	-0.001	0.0	0.0	0.0	0.0	0.0	0.0
STEAM PRODUCTION											
369	-0.001	0.0	0.1	-0.001	-0.001	0.0	0.0	0.0	0.0	0.0	0.0
369	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
STATION TOTAL	-0.001	0.0	0.0	-0.001	-0.001	0.0	0.0	0.0	0.0	0.0	0.0
STEAM PRODUCTION											
372	990096.021	0.0	0.1	990096.021	990096.021	723542.321	267354.501	723542.321	267354.501	1.9551	5227.541
STATION TOTAL	990096.021	0.0	0.0	990096.021	990096.021	723542.321	267354.501	723542.321	267354.501	1.9551	5227.541
STEAM PRODUCTION											
501	-0.001	0.0	0.1	-0.001	-0.001	0.0	0.0	0.0	0.0	0.0	0.0
501	0.0	0.0	0.1	0.0	0.0	-0.001	0.001	-0.001	0.001	0.0	0.0
STATION TOTAL	-0.001	0.0	0.0	-0.001	-0.001	0.0	0.0	0.0	0.0	0.0	0.0
STEAM PRODUCTION											
503	11975379.261	0.0	0.1	11975379.261	11975379.261	5045931.141	612946.121	5045931.141	612946.121	20.6541	1756337.791
STATION TOTAL	11975379.261	0.0	0.0	11975379.261	11975379.261	5045931.141	612946.121	5045931.141	612946.121	20.6541	1756337.791

- ELECTRIC STEAM GENERATING STATIONS - EDDYSTONE 4

- ELECTRIC STEAM GENERATING STATIONS - ESSEX CHEMICAL

- ELECTRIC STEAM GENERATING STATIONS - ALLIED CHEMICAL

- ELECTRIC STEAM GENERATING STATIONS - NE COAL STORAGE

- ELECTRIC STEAM GENERATING STATIONS - INTERCONNECTION OFFICE

- ELECTRIC STEAM GENERATING STATIONS - TOOLS & WORK EQUIPMENT

- ELECTRIC STEAM GENERATING STATIONS - 107H + CHESTNUT

- ELECTRIC STEAM GENERATING STATIONS - SANC

1960 = TERMINAL YEAR

PHILADELPHIA ELECTRIC COMPANY SCHEDULE II
ANNUAL PROVISION FOR DEPRECIATION
CLASS OF SERVICE: ELECTRIC
YEAR: 1964

SYSTEM 3, REMAINING LIFE

R102596

06/13/64

DEPRECIABLE PLANT

LOCATION ACCOUNT	BALANCE 1/1	ADDITIONS	RETIREMENTS	ADJUSTMENTS	BALANCE 12/31	MAJOR LIFE RESERVE 12/31	NET PLANT RESERVE	LIFE	REMAINING LIFE
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STEAM PRODUCTION					TOTAL OF ALL STATIONS				
999	3100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
999	3102	7597706.00	0.00	0.00	7597706.00	0.00	7597706.00	0.00	0.00
999	3102	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
999	3110	223420720.70	0.00	0.00	223420720.70	0.00	223420720.70	0.00	0.00
999	3120	602401009.92	0.00	0.00	602401009.92	0.00	602401009.92	0.00	0.00
999	3140	174468556.13	0.00	0.00	174468556.13	0.00	174468556.13	0.00	0.00
999	3150	116659034.20	0.00	0.00	116659034.20	0.00	116659034.20	0.00	0.00
999	3160	12052312.06	0.00	0.00	12052312.06	0.00	12052312.06	0.00	0.00
FUNCTIONAL TOTAL					1136079059.73	0.00	1136079059.73	0.00	1136079059.73

NUCLEAR PRODUCTION					NUCLEAR POWER GENERATING STATIONS - SALEM 1					
61	3201	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
61	3210	50046895.10	443161.00	0.00	50488056.10	5301075.60	703085.02	0.00	0.00	
61	3220	13072921.66	364744.00	0.00	13437665.66	14025294.33	21965503.23	119791002.43	3.765	
61	3230	30000226.02	220290.00	0.00	30220516.02	39901976.06	57272275.70	3535951.04	3.766	
61	3240	51779059.43	123174.00	0.00	51902233.43	52394916.43	0311795.95	44600977.40	3.767	
61	3250	7200266.72	159702.00	0.00	7359968.72	8006017.72	1365451.69	7439917.03	3.679	
STATION TOTAL					207463569.73	13509921.00	29973490.73	4523092.45	254734520.20	3.750

NUCLEAR PRODUCTION					NUCLEAR POWER GENERATING STATIONS - SALEM 2					
62	3210	51451164.01	4152465.19	0.00	55603629.20	602336497.40	8009150.23	63212671.77	3.101	
62	3220	195721019.96	7337445.04	0.00	203058464.00	202177742.40	10543316.00	190095140.12	3.313	
62	3230	55516367.27	7083944.73	0.00	62600311.00	63336039.63	3629917.95	65922774.05	3.990	
62	3240	61292323.64	3196040.36	0.00	64482763.00	6435957.02	9469120.13	6150301.07	3.897	
62	3250	6160600.09	1597476.11	0.00	7758076.20	8277590.57	66544.43	8277590.57	3.216	
STATION TOTAL					370145399.57	24167579.43	423210974.00	34647657.62	308571316.30	3.805

NUCLEAR PRODUCTION					NUCLEAR POWER GENERATING STATIONS - SALEM CP				
63	3201	43406.56	0.00	0.00	43406.56	43406.56	0.00	0.00	0.00
63	3210	94224267.12	0.00	0.00	94224267.12	94224267.12	0.00	0.00	0.00
63	3220	39211437.66	0.00	0.00	39211437.66	39211437.66	0.00	0.00	0.00
63	3230	40821704.70	0.00	0.00	40821704.70	40821704.70	0.00	0.00	0.00
63	3240	28630075.70	0.00	0.00	28630075.70	28630075.70	0.00	0.00	0.00
63	3250	8402953.61	0.00	0.00	8402953.61	8402953.61	0.00	0.00	0.00
STATION TOTAL					203021025.43	203021025.43	0.00	0.00	0.00

NUCLEAR PRODUCTION					NUCLEAR POWER GENERATING STATIONS - PERCH BOTTOM 2				
66	3201	244070.92	0.00	0.00	244070.92	244070.92	0.00	0.00	0.00
66	3202	44043.62	0.00	0.00	44043.62	44043.62	0.00	0.00	0.00
66	3210	94916205.20	0.00	0.00	94916205.20	94916205.20	0.00	0.00	0.00
66	3220	200377204.71	22317507.00	0.00	222598911.71	222598911.71	0.00	0.00	0.00
66	3230	64900037.76	133004371.00	0.00	200004308.76	215566030.21	40500012.90	102113970.75	4.229
66	3240	37566970.09	524639.00	0.00	38091609.09	38091609.09	0.00	0.00	0.00
66	3250	16371404.94	751750.00	0.00	17123150.94	17123150.94	0.00	0.00	0.00
STATION TOTAL					414429394.24	505221330.00	0.00	0.00	0.00

NUCLEAR PRODUCTION					NUCLEAR POWER GENERATING STATIONS - TERMINAL YEAR				
66	3201	244070.92	0.00	0.00	244070.92	244070.92	0.00	0.00	0.00
66	3202	44043.62	0.00	0.00	44043.62	44043.62	0.00	0.00	0.00
66	3210	94916205.20	0.00	0.00	94916205.20	94916205.20	0.00	0.00	0.00
66	3220	200377204.71	22317507.00	0.00	222598911.71	222598911.71	0.00	0.00	0.00
66	3230	64900037.76	133004371.00	0.00	200004308.76	215566030.21	40500012.90	102113970.75	4.229
66	3240	37566970.09	524639.00	0.00	38091609.09	38091609.09	0.00	0.00	0.00
66	3250	16371404.94	751750.00	0.00	17123150.94	17123150.94	0.00	0.00	0.00
STATION TOTAL					414429394.24	505221330.00	0.00	0.00	0.00

NUCLEAR PRODUCTION					NUCLEAR POWER GENERATING STATIONS - TERMINAL YEAR				
365	3210	1511631.91	500000.00	0.00	2017631.91	1764631.91	203721.61	1013910.30	1.027
365	3250	51033.78	0.00	0.00	51033.78	51033.78	3016.99	40016.79	1.304
STATION TOTAL					1562665.69	500000.00	0.00	2067745.70	1053927.09

PHILADELPHIA ELECTRIC COMPANY
ANNUAL PROVISION FOR DEPRECIATION
CLASS OF SERVICE: ELECTRIC
YEAR: 1984

SCHEDULE IX
SYSTEM 3, REMAINING LIFE

R102590

06/13/84

DEPRECIABLE PLANT

LOCATION ACCOUNT	BALANCE 1/1	ADDITIONS	RETIREMENTS	ADJUSTMENTS	BALANCE 12/31	WHOLE LIFE RESERVE 12/31	NET PLANT - RESERVE	LIFE	REMAIN. LIFE	ACCRUAL	
STATION TOTAL	1563465.69	504000.00	0.0	0.0	2069465.69	206730.60	1862727.09	1.0351	19270.901		
NUCLEAR PRODUCTION											
3201	800285.401	0.0	0.1	0.1	800285.401	0.0	800285.401	0.0	0.0		
3202	44043.821	0.0	0.1	0.1	44043.821	0.0	44043.821	0.0	0.0		
3210	892969624.141	15940001.191	0.0	0.1	32084505.331	300307004.731	50025920.901	264970504.351	0.0	9655441.751	
3220	57403463.991	32702396.441	0.0	0.1	61232134.031	593170162.011	69304641.901	523016510.051	0.0	19707662.001	
3230	199727336.551	23390015.731	0.0	0.1	5757000.001	220075082.201	34503924.411	194371127.071	0.0	7204913.401	
3240	171276347.241	4951001.361	0.0	0.1	2939000.001	179167109.101	175221740.421	151354121.441	0.0	5540350.031	
3250	30203197.941	10711736.311	0.0	0.1	1200000.001	50202004.051	44243015.991	43442225.201	0.0	1649707.301	
FUNCTIONAL TOTAL	1276623449.661	87705530.431	0.0	0.0	39374000.001	1339470320.091	1335563464.061	217200373.001	1177494906.291	3.7641	43040000.641
- TOTAL OF ALL STATIONS											
3300	0.0	0.0	0.1	0.1	200205.401	200205.401	0.0	200205.401	0.0	0.0	
3301	0.0	0.0	0.1	0.1	44043.821	44043.821	0.0	44043.821	0.0	0.0	
3302	0.0	0.0	0.1	0.1	32084505.331	300307004.731	50025920.901	264970504.351	0.0	9655441.751	
3303	0.0	0.0	0.1	0.1	61232134.031	593170162.011	69304641.901	523016510.051	0.0	19707662.001	
3304	0.0	0.0	0.1	0.1	5757000.001	220075082.201	34503924.411	194371127.071	0.0	7204913.401	
3305	0.0	0.0	0.1	0.1	2939000.001	179167109.101	175221740.421	151354121.441	0.0	5540350.031	
3306	0.0	0.0	0.1	0.1	1200000.001	50202004.051	44243015.991	43442225.201	0.0	1649707.301	
STATION TOTAL	0.0	0.0	0.0	0.0	1339470320.091	1335563464.061	217200373.001	1177494906.291	3.7641	43040000.641	

STATION	HYDRAULIC PRODUCTION	ELECTRIC STEAM GENERATING STATIONS	NUDDY RUN	DELTA SERVICE BLDG	TERMINAL YEAR					
19	3300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	3301	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	3302	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	3303	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	3304	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	3305	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	3306	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	3310	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	3311	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	3312	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	3313	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	3320	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	3321	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	3323	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	3330	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	3340	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	3350	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	3351	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	3353	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	3360	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
STATION TOTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

STATION	HYDRAULIC PRODUCTION	REFUSED STORAGE GENERATING PLANT	DELTA SERVICE BLDG	TERMINAL YEAR						
999	3300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
999	3301	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
999	3302	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
999	3303	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
999	3304	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
999	3305	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
999	3306	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
999	3310	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
999	3311	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
999	3312	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
999	3313	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
999	3320	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
999	3321	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
999	3323	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
999	3330	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
999	3340	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
999	3350	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
999	3351	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
999	3353	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
999	3360	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
STATION TOTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

- TOTAL OF ALL STATIONS

- TOTAL

0 = TERMINAL YEAR

0 = TERMINAL YEAR

PHILADELPHIA ELECTRIC COMPANY
 ANNUAL PROVISION FOR DEPRECIATION
 CLASS OF SERVICE: ELECTRIC
 YEAR: 1984

SCHEDULE II
 SYSTEM 3, REMAINING LIFE
 R102596

06/13/86

DEPRECIABLE PLANT

LOCATION ACCOUNT	BALANCE 12/31	ADDITIONS	RETIREMENTS	ADJUSTMENTS	BALANCE 12/31	WHOLE LIFE RESERVE 12/31	NET PLANT - RESERVD. RATE	LIFE/REMARKS	ACCUAL	
STATION TOTAL	308470.43	0.0	0.0	0.0	308470.43	101593.40	126876.95	10.383	23247.72	
OTHER PRODUCTION										
100	1639.54	0.0	0.0	0.0	1639.54	0.0	0.0	0.0	0.0	
100	0.0	0.0	0.0	0.0	0.0	-0.00	0.00	0.0	0.0	
100	0.0	0.0	0.0	0.0	0.0	-0.00	0.00	0.0	0.0	
100	0.0	0.0	0.0	0.0	0.0	-0.00	0.00	0.0	0.0	
100	0.0	0.0	0.0	0.0	0.0	-0.00	0.00	0.0	0.0	
STATION TOTAL	1639.54	0.0	0.0	0.0	1639.54	-0.00	0.00	0.0	0.0	
OTHER PRODUCTION										
209	25726.23	0.0	0.0	0.0	25726.23	0.0	25726.23	0.0	0.0	
109	6949.66	0.0	0.0	0.0	6949.66	4590.73	2350.93	28.874	674.11	
109	244483.58	0.0	0.0	0.0	244483.58	142040.56	103563.02	20.711	29733.64	
109	23084.75	0.0	0.0	0.0	23084.75	14713.03	8371.72	20.712	2403.91	
109	1920.58	0.0	0.0	0.0	1920.58	1027.04	892.74	20.605	255.34	
STATION TOTAL	304004.00	0.0	0.0	0.0	304004.00	163100.16	148904.64	20.709	33866.00	
OTHER PRODUCTION										
3401	4765.16	0.0	0.0	0.0	4765.16	0.0	4765.16	0.0	0.0	
110	25850.69	0.0	0.0	0.0	25850.69	21304.36	4466.33	10.207	016.77	
110	253320.79	0.0	0.0	0.0	253320.79	152830.44	101882.35	10.325	18560.34	
110	54639.26	0.0	0.0	0.0	54639.26	35269.73	19369.53	10.327	3549.70	
110	1920.58	0.0	0.0	0.0	1920.58	980.05	939.73	10.217	171.19	
STATION TOTAL	340496.48	0.0	0.0	0.0	340496.48	289473.30	130823.10	10.323	23092.00	
OTHER PRODUCTION										
3401	676.77	0.0	0.0	0.0	676.77	0.0	676.77	0.0	0.0	
111	-0.00	0.0	0.0	0.0	-0.00	-0.00	0.00	0.0	0.0	
111	3450.00	0.0	0.0	0.0	3450.00	-0.00	0.00	0.0	0.0	
111	0.00	0.0	0.0	0.0	0.00	-0.00	0.00	0.0	0.0	
111	0.00	0.0	0.0	0.0	0.00	-0.00	0.00	0.0	0.0	
STATION TOTAL	676.77	0.0	0.0	0.0	676.77	-0.00	0.00	0.0	0.0	
OTHER PRODUCTION										
3401	2103.27	0.0	0.0	0.0	2103.27	0.0	2103.27	0.0	0.0	
112	3765.95	0.0	0.0	0.0	3765.95	1600.24	495.03	40.066	190.04	
112	85845.64	0.0	0.0	0.0	85845.64	2904.03	61.12	40.102	345.32	
112	30157.03	0.0	0.0	0.0	30157.03	105070.90	40.137	421.72	421.72	
112	1986.06	0.0	0.0	0.0	1986.06	9839.97	40.139	3949.61	3949.61	
STATION TOTAL	208679.55	0.0	0.0	0.0	208679.55	1070.02	820.04	40.033	331.00	
OTHER PRODUCTION										
3401	2103.27	0.0	0.0	0.0	2103.27	0.0	2103.27	0.0	0.0	
112	3765.95	0.0	0.0	0.0	3765.95	1600.24	495.03	40.066	190.04	
112	85845.64	0.0	0.0	0.0	85845.64	2904.03	61.12	40.102	345.32	
112	30157.03	0.0	0.0	0.0	30157.03	105070.90	40.137	421.72	421.72	
112	1986.06	0.0	0.0	0.0	1986.06	9839.97	40.139	3949.61	3949.61	
STATION TOTAL	208679.55	0.0	0.0	0.0	208679.55	117095.94	40.136	46997.66	46997.66	
OTHER PRODUCTION										
3401	3703.17	0.0	0.0	0.0	3703.17	0.0	3703.17	0.0	0.0	
113	253057.35	0.0	0.0	0.0	253057.35	3803.37	779.00	11.074	92.59	
113	31526.37	0.0	0.0	0.0	31526.37	145125.21	107935.14	11.915	12859.04	
113	1906.05	0.0	0.0	0.0	1906.05	19356.27	12170.10	11.916	1450.19	
STATION TOTAL	290273.74	0.0	0.0	0.0	290273.74	1013.68	893.17	11.004	105.42	
OTHER PRODUCTION										
3401	3703.17	0.0	0.0	0.0	3703.17	0.0	3703.17	0.0	0.0	
113	253057.35	0.0	0.0	0.0	253057.35	3803.37	779.00	11.074	92.59	
113	31526.37	0.0	0.0	0.0	31526.37	145125.21	107935.14	11.915	12859.04	
113	1906.05	0.0	0.0	0.0	1906.05	19356.27	12170.10	11.916	1450.19	
STATION TOTAL	290273.74	0.0	0.0	0.0	290273.74	1013.68	893.17	11.004	105.42	

PHILADELPHIA ELECTRIC COMPANY SCHEDULE II
 ANNUAL PROVISION FOR DEPRECIATION
 CLASS OF SERVICE: ELECTRIC
 YEAR: 1964

SYSTEM 3, REMAINING LIFE
 MID2596

04/13/84

DEPRECIABLE PLANT

LOCATION ACCOUNT	BALANCE 12/31	ADDITIONS	RETIREMENTS	ADJUSTMENTS	BALANCE 12/31	WHOLE LIFE RESERVE 12/31	NET PLANT - RESERVE	LIFE	REMAIN. LIFE	ACCUAL
OTHER PRODUCTION										
114 STATION TOTAL	0.0	0.0	0.0	0.0	0.0	2000	-0.00	0.00	0.0	0.0
- ELECTRIC INTERNAL COMBUSTION ENGS - PEACH BOTTOM										
OTHER PRODUCTION										
115 STATION TOTAL	0.0	0.0	0.0	0.0	0.0	-0.00	0.00	0.0	0.0	0.0
- ELECTRIC INTERNAL COMBUSTION ENGS - DELAWARE										
OTHER PRODUCTION										
115 STATION TOTAL	74933.72	0.0	0.0	0.0	74933.72	1994	74933.72	0.0	0.0	0.0
115 3401	2754.00	0.0	0.0	0.0	2754.00	0.0	4771.11	10.533	502.53	0.0
115 3420	102930.61	0.0	0.0	0.0	102930.61	22903.69	62452.20	10.629	639.21	0.0
115 3430	0.0	0.0	0.0	0.0	0.0	120470.41	0.00	0.0	0.0	0.0
115 3440	527272.22	0.0	0.0	0.0	527272.22	-0.00	2754054.72	10.466	29362.31	0.0
115 3450	1110964.37	0.0	0.0	0.0	1110964.37	573276.17	545600.20	10.466	80205.19	0.0
STATION TOTAL	6677305.72	0.0	0.0	0.0	6677305.72	3234605.57	3442700.15	10.465	359100.24	0.0
- ELECTRIC INTERNAL COMBUSTION ENGS - SCHUYLKILL										
OTHER PRODUCTION										
116 STATION TOTAL	1040.00	0.0	0.0	0.0	1040.00	1994	1040.00	0.0	0.0	0.0
116 3401	37120.73	0.0	0.0	0.0	37120.73	0.0	13009.97	10.532	142.00	0.0
116 3420	156096.30	0.0	0.0	0.0	156096.30	23230.76	59033.47	10.627	6350.21	0.0
116 3430	0.0	0.0	0.0	0.0	0.0	96262.03	0.00	0.0	0.0	0.0
116 3440	1394697.32	0.0	0.0	0.0	1394697.32	-0.00	647354.76	10.467	6902.91	0.0
116 3450	437073.53	0.0	0.0	0.0	437073.53	747342.26	216717.26	10.465	2312.61	0.0
STATION TOTAL	2026043.96	0.0	0.0	0.0	2026043.96	1000000.92	930043.54	10.462	99066.59	0.0
- ELECTRIC INTERNAL COMBUSTION ENGS - CHESTER										
OTHER PRODUCTION										
117 STATION TOTAL	6036.22	0.0	0.0	0.0	6036.22	1994	6036.22	0.0	0.0	0.0
117 3401	29522.70	0.0	0.0	0.0	29522.70	0.0	7703.31	10.531	011.20	0.0
117 3420	151704.65	0.0	0.0	0.0	151704.65	102071.11	49033.54	10.630	5275.93	0.0
117 3430	0.0	0.0	0.0	0.0	0.0	-0.00	0.00	0.0	0.0	0.0
117 3440	3010415.22	0.0	0.0	0.0	3010415.22	1976520.35	1033094.07	10.467	19510.26	0.0
117 3450	036752.61	0.0	0.0	0.0	036752.61	429241.47	407211.14	10.460	43472.69	0.0
STATION TOTAL	4034431.40	0.0	0.0	0.0	4034431.40	2529652.40	2304779.00	10.466	245170.36	0.0
- ELECTRIC INTERNAL COMBUSTION ENGS - KEYSSTONE WISSEL										
OTHER PRODUCTION										
110 STATION TOTAL	0079.67	0.0	0.0	0.0	0079.67	1994	0079.67	5.525	140.61	0.0
110 3430	0.0	0.0	0.0	0.0	0.0	6334.70	2544.09	0.0	0.0	0.0
110 3440	109359.11	0.0	0.0	0.0	109359.11	-0.00	0.00	0.0	0.0	0.0
110 3450	10073.17	0.0	0.0	0.0	10073.17	105310.12	0440.99	5.575	4085.34	0.0
STATION TOTAL	217111.95	0.0	0.0	0.0	217111.95	12545.67	6307.50	5.567	351.15	0.0
- ELECTRIC INTERNAL COMBUSTION ENGS - FALLS										
OTHER PRODUCTION										
119 STATION TOTAL	114270.19	0.0	0.0	0.0	114270.19	1995	114270.19	9.530	100.72	0.0
119 3420	231553.14	0.0	0.0	0.0	231553.14	113137.34	0213.20	9.625	7905.23	0.0
119 3440	4300425.61	0.0	0.0	0.0	4300425.61	149420.06	219564.17	9.662	212347.40	0.0
119 3450	714132.77	0.0	0.0	0.0	714132.77	2164661.44	353173.21	9.662	34141.31	0.0
STATION TOTAL	5440309.71	0.0	0.0	0.0	5440309.71	2007979.22	2632410.49	9.660	254302.06	0.0
- ELECTRIC INTERNAL COMBUSTION ENGS - MOSER										
OTHER PRODUCTION										
120 STATION TOTAL	1272.20	0.0	0.0	0.0	1272.20	1995	1272.20	9.661	6.0	0.0
120 3401	116026.10	0.0	0.0	0.0	116026.10	0.0	36030.06	9.530	3601.43	0.0
120 3420	150252.43	0.0	0.0	0.0	150252.43	70190.04	59086.97	9.625	5607.11	0.0
120 3440	4260912.49	0.0	0.0	0.0	4260912.49	2114271.00	2154640.69	9.662	200176.07	0.0

PHILADELPHIA ELECTRIC COMPANY SCHEDULE II
ANNUAL PROVISION FOR DEPRECIATION
CLASS OF SERVICE: ELECTRIC
YEAR: 1904

SYSTEM 3, REMAINING LIFE

R102590

06/13/06

DEPRECIABLE PLANT

LOCATION ACCOUNT	BALANCE 1/1	ADDITIONS	RETIREMENTS	ADJUSTMENTS	BALANCE 12/31	WHOLE LIFE RESERVE 12/31	12/31 NET PLANT	LIFE	REMAIN. LIFE	ACCUAL
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120	790441.27	0.0	0.0	0.0	790441.27	390090.55	400350.72	9.661	30670.46	
STATION TOTAL	535704.49	0.0	0.0	0.0	535704.49	2601723.05	2653900.64	9.659	25623.07	

OTHER PRODUCTION

121	190271.30	0.0	0.0	0.0	190271.30	94664.47	103606.91	4.014	4987.61	
121	5356.53	0.0	0.0	0.0	5356.53	2530.56	2017.97	4.015	135.67	
STATION TOTAL	203627.91	0.0	0.0	0.0	203627.91	97203.03	106424.00	4.014	5123.20	

OTHER PRODUCTION

122	1407.01	0.0	0.0	0.0	1407.01	0.00	1407.01	0.0	0.0	
122	0.0	0.0	0.0	0.0	0.0	-0.00	0.00	0.0	0.0	
122	0.0	0.0	0.0	0.0	0.0	-0.00	0.00	0.0	0.0	
122	0.0	0.0	0.0	0.0	0.0	-0.00	0.00	0.0	0.0	
STATION TOTAL	1407.01	0.0	0.0	0.0	1407.01	-0.00	1407.01	0.0	0.0	

OTHER PRODUCTION

123	100391.29	0.0	0.0	0.0	100391.29	0.0	300391.29	0.0	0.0	
123	602354.53	0.0	0.0	0.0	602354.53	390649.65	201064.66	9.529	14420.43	
123	979053.73	0.0	0.0	0.0	979053.73	564134.05	414919.60	9.632	39920.94	
123	17177551.34	0.0	0.0	0.0	17177551.34	8259659.41	8917091.93	9.649	66500.14	
123	3350296.17	0.0	0.0	0.0	3350296.17	1866995.69	2005306.53	9.650	20102.42	
123	45463.23	0.0	0.0	0.0	45463.23	21332.00	24330.63	9.565	2308.15	
STATION TOTAL	2225510.29	0.0	0.0	0.0	2225510.29	10510591.55	11744510.74	9.646	1123105.20	

OTHER PRODUCTION

124	3319.51	0.0	0.0	0.0	3319.51	0.0	3319.51	0.0	0.0	
124	105750.79	0.0	0.0	0.0	105750.79	109068.39	76662.50	100.000	76662.64	
124	244564.19	0.0	0.0	0.0	244564.19	169461.02	75103.17	100.000	75103.17	
124	0.0	0.0	0.0	0.0	0.0	-0.00	0.00	0.0	0.0	
124	322121.06	0.0	0.0	0.0	322121.06	168650.09	153470.97	100.000	153470.97	
124	197540.13	0.0	0.0	0.0	197540.13	150231.67	47300.66	100.000	47300.66	
124	14410.14	0.0	0.0	0.0	14410.14	7020.43	6509.71	100.000	6509.71	
STATION TOTAL	967705.02	0.0	0.0	0.0	967705.02	605231.60	362474.42	100.000	359154.91	

OTHER PRODUCTION

126	525.52	0.0	0.0	0.0	525.52	265.02	259.70	0.701	22.59	
126	259321.09	0.0	0.0	0.0	259321.09	140059.42	119262.47	0.795	10408.67	
126	0.0	0.0	0.0	0.0	0.0	-0.00	0.00	0.0	0.0	
126	1465777.99	0.0	0.0	0.0	1465777.99	735612.29	730065.70	0.030	64473.53	
126	464394.44	0.0	0.0	0.0	464394.44	237398.60	246987.64	0.030	21609.07	
126	61501.61	0.0	0.0	0.0	61501.61	26604.09	34977.52	0.742	3057.61	
STATION TOTAL	2251601.45	0.0	0.0	0.0	2251601.45	1119930.22	1131663.23	0.823	98052.27	

OTHER PRODUCTION

129	404194.53	0.0	0.0	0.0	404194.53	0.0	404194.53	0.0	0.0	
129	3125796.53	0.0	0.0	0.0	3125796.53	1418903.76	1710092.75	6.901	110071.11	
129	19602421.61	0.0	0.0	0.0	19602421.61	4001372.25	14746350.16	6.989	1030543.79	
129	37500980.07	0.0	0.0	0.0	37500980.07	11476055.44	26032925.43	7.016	1026391.75	
129	3571123.05	0.0	0.0	0.0	3571123.05	702532.20	2700591.65	7.021	195777.23	

OTHER PRODUCTION

129	404194.53	0.0	0.0	0.0	404194.53	0.0	404194.53	0.0	0.0	
129	3125796.53	0.0	0.0	0.0	3125796.53	1418903.76	1710092.75	6.901	110071.11	
129	19602421.61	0.0	0.0	0.0	19602421.61	4001372.25	14746350.16	6.989	1030543.79	
129	37500980.07	0.0	0.0	0.0	37500980.07	11476055.44	26032925.43	7.016	1026391.75	
129	3571123.05	0.0	0.0	0.0	3571123.05	702532.20	2700591.65	7.021	195777.23	

OTHER PRODUCTION

129	404194.53	0.0	0.0	0.0	404194.53	0.0	404194.53	0.0	0.0	
129	3125796.53	0.0	0.0	0.0	3125796.53	1418903.76	1710092.75	6.901	110071.11	
129	19602421.61	0.0	0.0	0.0	19602421.61	4001372.25	14746350.16	6.989	1030543.79	
129	37500980.07	0.0	0.0	0.0	37500980.07	11476055.44	26032925.43	7.016	1026391.75	
129	3571123.05	0.0	0.0	0.0	3571123.05	702532.20	2700591.65	7.021	195777.23	

OTHER PRODUCTION

129	404194.53	0.0	0.0	0.0	404194.53	0.0	404194.53	0.0	0.0	
129	3125796.53	0.0	0.0	0.0	3125796.53	1418903.76	1710092.75	6.901	110071.11	
129	19602421.61	0.0	0.0	0.0	19602421.61	4001372.25	14746350.16	6.989	1030543.79	
129	37500980.07	0.0	0.0	0.0	37500980.07	11476055.44	26032925.43	7.016	1026391.75	
129	3571123.05	0.0	0.0	0.0	3571123.05	702532.20	2700591.65	7.021	195777.23	

PHILADELPHIA ELECTRIC COMPANY SCHEDULE 11
 ANNUAL PROVISION FOR DEPRECIATION
 CLASS OF SERVICE: ELECTRIC
 YEAR: 1964

SYSTEM 3, REMAINING LIFE

06/13/64

R102590

DEPRECIABLE PLANT

LOCATION ACCOUNT	BALANCE 1/1	ADDITIONS	RETIREMENTS	ADJUSTMENTS	BALANCE 12/31	WHOLE LIFE RESERVE 12/31	12/31 NET PLANT - RESRVD.	LIFE RATE	REMAIN. LIFE ACCRUAL	
601 3710	275519.73	0.0	0.0	0.0	275519.73	105737.63	69702.26	3.406	3129.64	
601 3730	1369824.96	0.0	0.0	0.0	1369824.96	5778465.65	818049.91	9.666	795662.43	
601 3731	366673.69	459132.00	10000.0	0.0	821825.69	351115.62	476098.07	22.975	189545.93	
601 3732	823125.66	459132.00	186800.0	0.0	659457.66	1672466.00	4912191.66	4.905	358071.92	
601 3733	162612.15	6594.00	35000.0	0.0	167706.15	770344.20	898711.07	14.266	120211.77	
STATION TOTAL	1329519167.56	6544875.00	4412880.00	0.0	1388555912.56	1359037590.06	477286370.06	911349533.70	3.401	38264591.80
HERAL PLANT										
- MISCELLANEOUS										
601 3901	1735905.33	0.0	0.0	0.0	1735905.33	0.0	1735905.33	0.0	0.0	
601 3902	1375135.67	1902704.00	0.0	0.0	3277839.67	0.0	3277839.67	6.942	432766.30	
601 3911	42611.82	0.0	0.0	0.0	42611.82	855.49	48025.71	3.486	3444.23	
601 3912	24824.23	140405.00	0.0	0.0	165229.23	1636.04	30882.39	3.443	1312.33	
601 3910	400220.96	0.0	0.0	0.0	400220.96	176649.99	223570.97	10.140	22670.44	
601 3940	4349981.05	4237.00	0.0	0.0	4354218.05	1844376.50	2501762.27	3.207	60230.71	
601 3951	5105291.57	0.0	0.0	0.0	5105291.57	1669744.61	3535546.66	2.802	96872.54	
601 3952	674641.26	916681.00	39000.0	0.0	1080322.26	192930.59	1361311.67	2.070	39065.54	
601 3953	588885.90	0.0	0.0	0.0	588885.90	125193.37	383692.53	3.120	12003.00	
601 3970	669883.95	523082.00	11000.0	0.0	1192966.95	202941.65	1098044.30	3.403	37940.65	
601 3980	931237.35	0.0	0.0	0.0	931237.35	426657.69	310779.66	0.073	25089.90	
601 3990	-3436302.10	0.0	0.0	0.0	-3436302.10	0.0	-2995100.10	0.0	0.0	
601 3998	24945646.11	3497029.00	50000.00	641122.00	29953797.11	27009721.62	20123334.92	4.756	96031.00	
STATION TOTAL										

CLASS OF SERVICE	4531364374.1	19539466.1	5210000.1	3575012.2	4737290562.1	4644327460.1	1441095464.1	331595007.1	4.023	159094651.1
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DEPRECIABLE PLANT

81925-

LOCATION ACCOUNT GENERAL PLANT	BALANCE 12/1	ADDITIONS - MISCELLANEOUS	RETIREMENTS	ADJUSTMENTS	BALANCE 12/31	RESERVE 12/31	WHOLE LIFE		12/31 NET PLANT - RESERVE		LIFE REMAIN.	LIFE ACCUM.
							12/31	12/31	PLANT	RESERVE		
601 43010	677135.09	0.0	0.1	0.1	677135.09	0.0	0	TERMINAL YEAR	677135.09	0.0	0.0	0.0
601 43090	0.0	270001.00	0.1	0.1	270001.00	0.0	0	0.10	270001.00	0.0	0.0	0.0
601 43091	2340056.07	0.0	0.1	0.1	2340056.07	0.0	0	0.10	2340056.07	0.0	0.0	0.0
601 43092	1205.00	0.0	0.1	0.1	1205.00	0.0	0	0.10	1205.00	0.0	0.0	0.0
601 43098	80574936.99	4544200.00	0.1	0.1	85121136.99	0.0	0	0.10	85121136.99	0.0	0.0	0.0
601 43091	1764.00	0.0	0.1	0.1	1764.00	0.0	0	0.10	1764.00	0.0	0.0	0.0
601 43092	-0.00	0.0	0.1	0.1	-0.00	0.0	0	0.10	-0.00	0.0	0.0	0.0
601 43011	2742097.05	223236.00	0.1	0.1	2965333.05	0.0	0	0.10	2965333.05	0.0	0.0	0.0
601 43012	6775281.03	1000260.00	0.1	0.1	7775541.03	0.0	0	0.10	7775541.03	0.0	0.0	0.0
601 43013	10770790.33	0.0	0.1	0.1	10770790.33	0.0	0	0.10	10770790.33	0.0	0.0	0.0
601 43030	1770300.30	0.0	0.1	0.1	1770300.30	0.0	0	0.10	1770300.30	0.0	0.0	0.0
601 43041	269019.04	100440.00	0.1	0.1	279459.04	0.0	0	0.10	279459.04	0.0	0.0	0.0
601 43042	4074042.62	12276.00	0.1	0.1	4086318.62	0.0	0	0.10	4086318.62	0.0	0.0	0.0
601 43044	395540.71	0.0	0.1	0.1	395540.71	0.0	0	0.10	395540.71	0.0	0.0	0.0
601 43062	937.91	0.0	0.1	0.1	937.91	0.0	0	0.10	937.91	0.0	0.0	0.0
601 43063	50550.09	0.0	0.1	0.1	50550.09	0.0	0	0.10	50550.09	0.0	0.0	0.0
601 43064	0.0	0.0	0.1	0.1	0.0	0.0	0	0.10	0.0	0.0	0.0	0.0
601 43070	1049016.35	0.0	0.1	0.1	1049016.35	0.0	0	0.10	1049016.35	0.0	0.0	0.0
601 43081	407100.95	0.0	0.1	0.1	407100.95	0.0	0	0.10	407100.95	0.0	0.0	0.0
601 43082	1561640.04	0.0	0.1	0.1	1561640.04	0.0	0	0.10	1561640.04	0.0	0.0	0.0
601 43083	77049.36	0.0	0.1	0.1	77049.36	0.0	0	0.10	77049.36	0.0	0.0	0.0
601 43083	114457210.39	6440009.00	0.1	0.1	120897219.39	0.0	0	0.10	120897219.39	0.0	0.0	0.0
CLASS OF SERVICE	114457210.1	6440009.1	202000.1	0.1	120015119.1	117636114.69	30000994.1	01934125.1	6.1431	5013452.1		

PHILIPPA ELECTRIC COMPANY SCHEDULE II
 ANNUAL PROVISION FOR DEPRECIATION
 CLASS OF SERVICE: TRANSPORT
 YEAR: 1904

SYSTEM REMAINING LIFE

R102590

DEPRECIABLE PLANT

LOCATION ACCOUNT	BALANCE			ADDITIONS			RETIREMENTS			ADJUSTMENTS			BALANCE			WHOLE LIFE RESERVE 12/31	12/31 NET PAYM. - RESERVE	LIFE/PLANT - RESV/D. RATE	LIFE/REMAIN. LIFE/ACCRUAL
	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	12/31	12/31	12/31					
TRANSPORTATION																			
601	53920	10740149.72	0.0	0.0	215300.1	0.1	6591149.72	9467449.72	4520020.12	4070329.60	25.295	1029501.19							
601	53943	1306074.40	209572.00	0.1	1595446.40	0.1	1595446.40	1450060.40	262553.02	333093.46	4.076	56336.63							
601	53961	1512321.39	0.0	0.1	1512321.39	0.1	1512321.39	1512321.39	1097104.90	415216.99	34.001	144470.97							
STATION TOTAL		13562545.59	209572.00	215300.00	215300.00	0.0	11699117.59	12630031.59	5000670.04	5010639.55	21.112	1220414.79							
CLASS OF SERVICE		13562546.1	209572.1	215300.1	215300.1	0.1	11699210.1	12630032.1	5000470.1	5010640.1	21.112	1220415.1							

0 = TERMINAL YEAR

PHILADELPHIA ELECTRIC COMPANY
1984 DEPRECIATION STUDY
LIFE ESTIMATES BY PRIMARY ACCOUNT

ELECTRIC PLANT

<u>Plant Account</u>	<u>Life Span</u>		<u>Average Life Iowa Curve</u>
	<u>Interim Retirement Iowa Curve</u>	<u>Estimate Terminal Year</u>	
INTANGIBLE PLANT			
3020 Franchises and Consents	Nondepreciable		
PRODUCTION PLANT - STEAM			
3100 Land and Land Rights	Nondepreciable		
3110 Structures and Improvements	90R ₄	*	
3120 Boiler Plant Equipment	70R ₂	*	
312.21 Boiler Plant Equipment - Tools and Equipment			30S ₀
3140 Turbogenerator Units	75R ₂	*	
3150 Accessory Electric Equipment	75R ₂	*	
315.23 Accessory Electric Equipment - SAMAC	30R ₂	1988	
3160 Miscellaneous Power Plant Equipment	80R ₃	*	
PRODUCTION PLANT - NUCLEAR			
3200 Land and Land Rights	Nondepreciable		
3210 Structures and Improvements	90R ₄	*	
3220 Reactor Plant Equipment	70R ₂	*	
3230 Turbogenerator Units	75R ₂	*	
3240 Accessory Electric Equipment	75R ₂	*	
3250 Miscellaneous Power Plant Equipment	80R ₃	*	
PRODUCTION PLANT - HYDRAULIC			
3300 Land and Land Rights			Nondepreciable
3310 Structures and Improvements			87R ₁
3320 Reservoirs, Dams and Waterways			100R ₂
3330 Water Wheels, Turbines and Generators			40R ₂
3340 Accessory Electric Equipment			50R ₂
3350 Miscellaneous Power Plant Equipment			50R ₂
3360 Roads, Railroads and Bridges			60R ₂

* See pages 14-16 for the estimated terminal year for individual units. In conformance with prior Commission rulings, the Company uses a 35-year life span for nuclear production units instead of the listed Engineering Department estimate for ratemaking purposes.

PHILADELPHIA ELECTRIC COMPANY

1984 DEPRECIATION STUDY
LIFE ESTIMATES BY PRIMARY ACCOUNT, cont.

Plant Account	Life Span		Average Life Iowa Curve
	Interim Retirement Iowa Curve	Estimated Terminal Year	
PRODUCTION PLANT - OTHER			
3400 Land and Land Rights	Nondepreciable		
3410 Structure and Improvements	90R ₄	*	
3420 Fuel Holders, Producers and Accessories	90R ₂	*	
3440 Generators	75R ₂	*	
3450 Accessory Electric Equipment	75R ₂	*	
3460 Miscellaneous Power Plant Equipment	80R ₃	*	
TRANSMISSION PLANT			
3500 Land and Land Rights			Nondepreciable
3520 Structures and Improvements			50R ₅
3530 Station Equipment			40R ₃
3540 Towers and Fixtures			35S ₂
3550 Poles and Fixtures			25L ₂
3560 Overhead Conductors and Devices			45S ₁
3570 Underground Conduit			50R ₄
3580 Underground Conductors and Devices			40R ₄
3590 Roads and Trails			20R ₅
DISTRIBUTION PLANT			
3600 Land and land Rights			Nondepreciable
3610 Structures and Improvements			55R ₃
3620 Station Equipment			45R ₂
3640 Poles, Towers and Fixtures			40R ₁
3650 Overhead Conductors and Devices			40L ₁
3660 Underground Conduit			50R ₄
3670 Underground Conductors and Devices			55R _{1/2}
3680 Transformers			35L ₀
3690 Services			
.1 Aerial			27R ₃
.2 Underground			35R ₁
370 Meters			
.1 Meters			29S ₁
.2 Installations			52S ₆

* See pages 14-16.

PHILADELPHIA ELECTRIC COMPANY

1984 DEPRECIATION STUDY
LIFE ESTIMATES BY PRIMARY ACCOUNT, cont.

ELECTRIC PLANT, cont.

<u>Plant Account</u>		<u>Average Life Iowa Curve</u>
DISTRIBUTION PLANT, cont.		
3710	Installation on Customers' premises	300 ₃
3730	Street Lighting and Signal Systems	
.0	Luminaires	17R ₁
.1	Aerial Conductors	7L ₀
.2	Underground Conductors	26L _{1/2}
.3	Private Outdoor Lighting	12S _{1/2}
GENERAL PLANT		
3890	Land and Land Rights	Nondepreciable
3900	Structures and Improvements	30R ₄
391.1	Office Machines	30L ₀
391.2	Office Furniture and Equipment	30L ₀
3930	Stores Equipment	23L ₂
3940	Tools, Shop and Garage Equipment	45R ₂
3950	Laboratory Equipment	
.1	Testing Division	45L ₁
.2	Meter Division	40R ₂
.3	Chemical Laboratory	42R ₃
3970	Communication Equipment	35R ₃
3980	Miscellaneous Equipment	23 S ₁
3990	Other Intangible Property	Nondepreciable

PHILADELPHIA ELECTRIC COMPANY
1984 DEPRECIATION STUDY
LIFE ESTIMATES BY PRIMARY ACCOUNT, cont.

COMMON PLANT

<u>Plant Account</u>	<u>Average Life Iowa Curve</u>
INTANGIBLE PLANT	
43010 Organization	Nondepreciable
GENERAL PLANT	
43890 Land and Land Rights	Nondepreciable
43900 Structures and Improvements	30L ₁
43910 Office Furniture and Equipment	10L ₀
43920 Transportation Equipment	11L ₂
43930 Stores Equipment	35L ₂
43940 Tools, Shop and Garage Equipment	30S ₀
43960 Power Operated Equipment	10S ₁
43970 Communication Equipment	35L ₄
43980 Miscellaneous Equipment	20L ₂

PHILADELPHIA ELECTRIC COMPANY
GENERATING UNITS
RETIREMENT DATES FOR DEPRECIATION PURPOSES

<u>Station Name and Unit No.</u>	<u>(1) Unit Type</u>	<u>Summer Rating Mw</u>	<u>Installation Date</u>	<u>Estimated Retirement Year</u>	<u>Age</u>	
Chester	7	GT	13	1969	1994	25 (5)
	8	GT	13	1969	1994	25 (5)
	9	GT	13	1969	1994	25 (5)
Conemaugh	1	ST	176 (2)	1970	2005	35
	2	ST	176 (2)	1971	2006	35
	D	IC	2.3 (2)	1970	2006	36
Conowingo	1	HY	36	1928	2014	86 (3)
	2	HY	36	1928	2014	86 (3)
	3	HY	36	1928	2014	86 (3)
	4	HY	36	1928	2014	86 (3)
	5	HY	36	1928	2014	86 (3)
	6	HY	36	1928	2014	86 (3)
	7	HY	36	1928	2014	86 (3)
	8	HY	65	1964	2014	50 (3)
	9	HY	65	1964	2014	50 (3)
	10	HY	65	1964	2014	50 (3)
	11	HY	65	1964	2014	50 (3)
Cromby	1	ST	146	1954	1989	35 (5)
	2	ST	201	1955	1990	35
	D	IC	2.7	1967	1990	23 (5)
Croydon	11	GT	49	1974	1999	25 (5)
	12	GT	49	1974	1999	25 (5)
	21	GT	49	1974	1999	25 (5)
	22	GT	49	1974	1999	25 (5)
	31	GT	49	1974	1999	25 (5)
	32	GT	49	1974	1999	25 (5)
	41	GT	49	1974	1999	25 (5)
	42	GT	49	1974	1999	25 (5)
Delaware	7	ST	126	1953	1988	35
	8	ST	124	1953	1988	35
	9	GT	15	1970	1995	25 (5)
	10	GT	13	1969	1994	25 (5)
	11	GT	13	1969	1994	25 (5)
	12	GT	13	1969	1994	25 (5)
	D	IC	2.7	1967	1988	21
Eddystone	1	ST	301	1960	1995	35 (5)
	2	ST	334	1960	1995	35 (5)
	3	ST	380	1974	2009	35
	4	ST	380	1976	2011	35
	10	GT	13	1967	1992	25 (5)
	20	GT	13	1967	1992	25 (5)
	30	GT	15	1970	1995	25 (5)
	40	GT	15	1970	1995	25 (5)

<u>Station Name and Unit No.</u>		<u>(1) Unit Type</u>	<u>Summer Rating Mw</u>	<u>Installation Date</u>	<u>Estimated Retirement Year</u>	<u>Age</u>
Falls	1	GT	15	1970	1995	25 (5)
	2	GT	15	1970	1995	25 (5)
	3	GT	15	1970	1995	25 (5)
Keystone	1	ST	178(2)	1967	2002	35
	2	ST	179(2)	1968	2003	35
	D	IC	2.3(2)	1968	2003	35
Limerick	1	NB	1055	1985	2025	40(4)
	2	NB	1055	1990	2030	40(4)
Moser	1	GT	15	1970	1995	25 (5)
	2	GT	15	1970	1995	25 (5)
	3	GT	15	1970	1995	25 (5)
Muddy Run	1	PS	110	1967	2014	47(3)
	2	PS	110	1967	2014	47(3)
	3	PS	110	1967	2014	47(3)
	4	PS	110	1967	2014	47(3)
	5	PS	110	1967	2014	47(3)
	6	PS	110	1967	2014	47(3)
	7	PS	110	1968	2014	46(3)
	8	PS	110	1968	2014	46(3)
Peach Bottom	2	NB	447(2)	1974	2008	34(4)
	3	NB	439(2)	1974	2008	34(4)
Plymouth Meeting	9	GT	29	1971	1985	14
	15	GT	29	1971	1985	14
Richmond	9	ST	166	1950	1985	35
	21	GT	30	1971	1985	14
	22	GT	30	1971	1985	14
	31	GT	30	1971	1985	14
	32	GT	30	1971	1985	14
	41	GT	20	1971	1985	14
	42	GT	20	1971	1985	14
	43	GT	20	1971	1985	14
	44	GT	20	1971	1985	14
	51	GT	30	1971	1985	14
	52	GT	30	1971	1985	14
	61	GT	30	1971	1985	14
	62	GT	30	1971	1985	14
	71	GT	20	1971	1985	14
	72	GT	20	1971	1985	14
	73	GT	20	1971	1985	14
	74	GT	20	1971	1985	14
	81	GT	48	1973	1998	25(5)
	91	GT	48	1973	1998	25(5)
92	GT	48	1973	1998	25(5)	
D	IC	2.7	1967	1990	23(5)	

<u>Station Name and Unit No.</u>	<u>(1) Unit Type</u>	<u>Summer Rating Mw</u>	<u>Installation Date</u>	<u>Estimated Retirement</u>		
				<u>Year</u>	<u>Age</u>	
Salem	1	NP	459(2)	1977	2008	31(4)
	2	NP	471(2)	1981	2008	27(4)
	3	GT	16(2)	1971	1996	25
Schuylkill	1	ST	166	1958	1993	35
	3	ST	15	1938	1988	50
	10	GT	13	1969	1994	25(5)
	11	GT	15	1971	1996	25(5)
	D	IC	2.8	1967	1993	26
Southwark	1	ST	178	1947	1985	38
	2	ST	178	1948	1985	37
	3	GT	13	1967	1992	25(5)
	4	GT	13	1967	1992	25(5)
	5	GT	13	1967	1992	25(5)
	6	GT	13	1968	1993	25(5)
	D	IC	2.7	1967	1985	18

FOOT NOTES:

1. Unit Types

- GT = Combustion Turbines
- ST = Fossil Steam
- IC = Diesel
- HY = Hydro
- NB = Nuclear BWR
- NP = Nuclear PWR
- PS = Pumped Storage Hydro

2. PECO share of jointly owned units

3. Expiration of FERC license

4. Expiration of NRC license

5. These units are currently being considered for life extension at additional capital cost.

- Q.1. Where the retirement rate actuarial method of mortality analysis is utilized, set forth representative examples including charts depicting the observed and estimated survivor curves and a tabular presentative of the observed and estimated life tables plotted on the chart. Other analysis results shall be subject to request.
- A.1. The information requested is included in Exhibit AW-1, the 1985 Plant Life Study for Electric and Common Plant. The charts depicting the claimed and estimated survivor curves and a tabular presentation of the observed life tables plotted on the charts is included in Appendices A and B respectively of this Exhibit.

Q.1. Provide the surviving original cost plant at the appropriate test year date or dates by account or functional property group and include claimed depreciation reserves. Provide annual depreciation accruals where appropriate. These calculations should be provided for plant in service as well as other categories of plant, including but not limited to, contribution in aid of construction, customers' advances for construction, and anticipated retirements associated with any construction work in progress claims (if applicable).

A.1. Pages C-1 through C-2g of Exhibits TPH-1 and TPH-2 provide a summary of the Company's original cost of electric plant in service and associated depreciation reserve by account, station and function for the test years ended June 30, 1985 and June 30, 1986 respectively. Similar data for the Company's common plant is provided on pages C-3 through C-3b of these same exhibits.

Pages C-4 through C-5f of Exhibits TPH-1 and TPH-2 provide a summary of the Company's electric operations annual book accruals by account, station and function for the test years ended June 30, 1985 and June 30, 1986, respectively. Similar data for the Company's common plant is provided on pages C-6 through C-6b of these same exhibits.

Contributions in aid of construction and customers advances for construction are credited to the plant accounts and are not depreciated.

As shown on page C-8 of Exhibit TPH-2, the Company's non-revenue producing construction work in progress claim is net of associated retirements.

- Q.2. Provide representative examples of detail calculations by vintage at account or at a more detailed level, as performed for these purposes. Other vintage detail calculations shall be subject to request.
- A.2. Pursuant to the Commission's order at R-842590, the Company's depreciation claim is based on book depreciation reserves and accruals calculated by the remaining life methodology. Under this methodology depreciation accruals and reserves are not available by vintages.

Detailed calculations of the Company's depreciation accruals are provided in Exhibits AW-2 and AW-3 for the June 30, 1985 and June 30, 1986 test years respectively.

A description of the depreciation methods utilized in calculating annual depreciation amounts is provided on page 1 of Exhibit AW-1. The Direct Testimony of A. Wroblewski provides additional discussion of the Company's book depreciation methodology.

Q.1. Provide a description of the depreciation methods utilized in calculating annual depreciation amounts and depreciation reserves, together with a discussion of the significant factors which were considered in arriving at estimates of service life and forecast retirements by facilities, accounts or sub-accounts, as applicable.

A.1. A description of the depreciation methods utilized in calculating annual depreciation amounts is provided on page 1 of Exhibit AW-1. The depreciation reserves are based on the amounts recorded on the Company's books, adjusted to a ratemaking basis as authorized by the Commission in its order at R-842590. The annual and accrued depreciation calculations are developed in Exhibit AW-2 and AW-3 and are summarized in Section C of Exhibit TPH-1 and TPH-2 for the historic and future test years respectively. Additional discussion of the Company's depreciation methodology is provided in the Direct Testimony of A. Wroblewski.

Q.1. Provide the following unadjusted detailed schedules by function and by FERC account for the claimed test year and for each of the three preceding comparable years:

Balance sheet (in the form available).

A.1. The Balance Sheets for the twelve months ended June 30, 1985 and June 30, 1986 are shown on pages B-1 and B-2 of Exhibits TPH-1 and TPH-2 respectively. Attachment VI-A-1 provides the Balance Sheet for the twelve month periods ending June 30, 1983 and 1984.

PHILADELPHIA ELECTRIC COMPANY
BALANCE SHEET
ASSETS AND OTHER DEBITS

	<u>June 30, 1984</u>	<u>June 30, 1983</u>
Utility Plant		
Plant at Original Cost -----	\$9,070,775,694	\$8,104,187,574
Accumulated Provision for Depreciation -----	(1,624,305,275)	(1,479,728,465)
	<u>7,446,470,419</u>	<u>6,624,459,109</u>
Nuclear Fuel -----	204,747,372	128,957,056
Property Under Capital Leases incl. Nuclear Fuel --	<u>370,921,076</u>	<u>-</u>
Total -----	<u>8,022,138,867</u>	<u>6,753,416,165</u>
Other Property and Investments		
Non-Utility Property -----	16,150,305	17,415,792
Accumulated Provision for Depreciation -----	(1,614,050)	(1,853,990)
Investments in Associated Companies -----	128,681,798	121,796,261
Other Investments -----	1,112,195	1,225,126
Decommissioning & Spent Nuclear Fuel Escrow Funds -	<u>50,535,906</u>	<u>20,488,043</u>
Total -----	<u>194,866,154</u>	<u>159,071,232</u>
Current and Accrued Assets		
Cash -----	46,702,309	38,859,509
Special Documents -----	2,902,858	620,127
Working Funds -----	6,785,711	6,660,532
Temporary Cash -----	-	167,920
Notes Receivable -----	305,905	247,964
Accounts Receivable -----	317,466,561	259,715,432
Receivable from Associated Companies -----	6,291,670	2,373,272
Materials & Supplies -----	145,215,679	132,634,143
Prepayments -----	84,499,007	74,584,266
Deferred Fuel Expense -----	151,338,425	(52,138,229)
Compensated Absences -----	<u>36,184,418</u>	<u>-</u>
Total -----	<u>797,692,543</u>	<u>463,724,936</u>
Deferred Debits		
Unamortized Debt Expense -----	8,722,634	5,745,753
Unamortized Loss on Reacquired Debt -----	12,757	13,963
Clearing Accounts -----	3,471,559	(1,839,386)
Miscellaneous Deferred Debit -----	50,303,257	37,358,040
Extraordinary Property Losses -----	11,542,512	8,790,411
Research & Development Expenditures -----	721,943	954,196
Accumulated Deferred Income Taxes -----	<u>36,473,563</u>	<u>69,691,622</u>
Total -----	<u>111,248,225</u>	<u>120,714,599</u>
TOTAL ASSETS AND OTHER DEBITS -----	<u>\$9,125,945,789</u>	<u>\$7,496,926,932</u>

PHILADELPHIA ELECTRIC COMPANY
BALANCE SHEET
LIABILITIES AND OTHER CREDITS

Attachment VI-A-1

	<u>June 30, 1984</u>	<u>June 30, 1983</u>
Proprietary Capital		
Common Stock Issued -----	\$2,216,959,440	\$1,950,044,918
Preferred Stock -----	849,577,000	733,546,000
Premium on Preferred Stock -----	1,213,910	1,213,910
Common Stock Subscribed -----	-	-
Other Paid in Capital -----	5,207,956	4,369,223
	<u>3,072,958,306</u>	<u>2,689,174,051</u>
Unappropriated Retained Earnings	465,866,881	404,185,964
Undistributed Subsidiary Earnings	25,785,957	25,283,669
Total	<u>3,564,611,144</u>	<u>3,118,643,684</u>
Long-Term Debt		
Bonds -----	2,766,230,000	2,674,541,000
Pollution Control Notes -----	265,585,000	226,915,000
Other Long-Term Debt -----	651,235,624	254,760,423
Unamortized Premium on Long-Term Debt -----	565,961	633,635
Unamortized Discount on Long-Term Debt -----	(19,422,761)	(18,502,626)
Total	<u>3,664,193,824</u>	<u>3,138,347,432</u>
Current and Accrued Liabilities		
Short-Term Debt		
Bank Loans (Pending Permanent Financing) -----	61,000,000	75,000,000
Commercial Paper -----	40,000,000	32,500,000
Current Maturities of Long-Term Debt -----	50,000,000	20,000,000
Obligations Under Capital Leases - Current -----	58,014,959	-
Accounts Payable -----	165,574,233	126,596,730
Payable to Associated Companies -----	3,748,727	1,805,957
Customer Deposits -----	6,861,395	6,052,811
Taxes Accrued -----	28,702,787	21,880,896
Interest Accrued -----	105,753,554	100,154,547
Dividends Declared -----	105,686,731	87,775,196
Tax Collections Payable -----	6,429,682	6,303,941
Miscellaneous Current and Accrued Liabilities -----	82,932,523	28,809,563
Deferred Income Taxes on Deferred Fuel -----	85,070,160	10,502,699
Compensated Absences Payable -----	36,184,418	-
Total	<u>835,959,169</u>	<u>517,382,340</u>
Deferred Credits		
Customer Advances for Construction -----	639,644	464,579
Accumulated Deferred Investment Tax Credits -----	297,906,738	301,069,194
Other Deferred Credits -----	47,419,822	24,265,384
Unamortized Gain on Reacquired Debt -----	12,484,494	10,966,391
Accumulated Deferred Income Taxes		
Accelerated Amortization Property -----	4,258,313	13,446,857
Other Property -----	370,000,755	321,489,315
Other -----	15,565,769	7,823,655
Obligations Under Capital Lease -----	312,906,117	-
Total	<u>1,061,181,652</u>	<u>679,525,375</u>
Operating Reserves -----	-	43,028,101
TOTAL LIABILITIES AND OTHER CREDITS -----	<u>\$9,125,945,789</u>	<u>\$7,496,926,932</u>

Q.1. Provide the following unadjusted detailed schedules by function and by FERC account for the claimed test year and for each of the three preceding comparable years:

Statement of income;

A.1. Page B-8 of Exhibit TPH-2 provides the requested data for the claimed test year. Attachment VI-B-1 provides the requested data for the three preceding comparable years.

Philadelphia Electric Company

INCOME STATEMENT
12 MONTHS ENDED JUNE 30, 1985

	<u>Total</u>	<u>Electric</u>	<u>Gas</u>	<u>Steam</u>
OPERATING REVENUE	2,977,922,919	2,455,964,119	447,468,558	74,490,242
OPERATING EXPENSES				
Operation & Maintenance	1,918,465,318	1,515,648,173	336,195,473	66,621,672
Depreciation	176,938,487	161,743,551	13,294,217	1,900,719
Amortization of Other Electric Plant	177,100	(643,900)	821,000	-
Amortization of Property Losses	(295,230)	(295,230)	-	-
TAXES				
PA Corporated Net Income Tax	35,083,440	29,253,134	5,141,828	688,478
Federal Corporate Income Tax	101,619,324	75,400,618	22,764,192	3,454,514
Other State & Local Income Taxes	1,481,135	1,481,135	-	-
Other Than Income				
Pennsylvania Gross Receipts Tax	124,819,147	105,213,021	19,606,126	-
Pennsylvania Capital Stock Tax	12,432,349	12,739,975	616,191	76,180
Pennsylvania Real Estate Tax	51,342,288	50,917,391	325,164	99,731
All Other	24,437,099	21,392,365	2,709,371	335,363
Provision for Deferred Income Taxes	76,351,762	74,712,053	3,348,852	(1,709,143)
Income Taxes Deferred In Prior Years	(38,996,520)	(38,756,307)	(227,534)	(12,679)
Investment Tax Credit Adjustments NET	52,510,359	50,803,306	1,721,501	(14,448)
Total Taxes	442,080,383	383,156,691	56,005,694	2,917,998
Gain/(Loss) on Disposition of Utility Property	(153,154)	(153,154)	-	-
Total Operating Expenses	2,537,212,904	2,059,456,131	406,316,384	71,440,389
Operating Income	<u>440,710,015</u>	<u>396,507,988</u>	<u>41,152,174</u>	<u>3,049,853</u>
OTHER INCOME				
Allowance for Other Funds Used				
During Construction	152,826,863			
Other Income and Deductions - Net	<u>131,344,830</u>			
Total Other Income	<u>284,171,693</u>			
Income Before Interest Charges	<u>724,881,708</u>			
INTEREST CHARGES				
Long-Term Debt	420,583,687			
Amortization of Debt Discount, Premium and Expense	1,359,139			
Interest on Short-Term Debt	14,087,187			
Other Interest Expense	12,367,469			
Allowance for Borrowed Funds Used				
During Construction	<u>242,940,801</u>			
Total Interest Charges	205,456,681			
Net Income	<u>519,425,027</u>			

PHILADELPHIA ELECTRIC COMPANY
 INCOME STATEMENT
 12 MONTHS ENDED JUNE, 1984

	Total	Electric	Gas	Steam
OPERATING REVENUE -----	\$2,807,426,124	\$2,267,403,114	\$455,898,830	\$84,124,180
OPERATING EXPENSES				
Operation and Maintenance -----	1,769,996,517	1,328,609,761	367,944,486	73,442,270
Depreciation -----	173,111,743	159,053,733	12,244,373	1,813,617
Amortization of Other Electric Plant -----	(641,122)	(641,122)	-	-
Amortization of Property Losses -----	4,012,278	3,191,278	821,000	-
<u>Taxes</u>				
Pennsylvania Corporate Net Income Tax -----	15,773,187	9,533,156	5,038,444	1,201,587
Federal Corporate Income Tax -----	71,840,232	46,292,336	20,219,694	5,328,202
Other State and Local Income Taxes -----	980,614	980,614	-	-
Other Than Income				
Pennsylvania Gross Receipts Tax -----	114,852,125	94,594,097	20,258,028	-
Pennsylvania Capital Stock Tax -----	19,560,645	18,402,154	1,025,059	133,432
Pennsylvania Real Estate Tax -----	34,445,125	34,150,155	223,480	71,490
All Other -----	23,539,606	20,547,522	2,617,568	374,516
Provision for Deferred Income Taxes -----	157,994,067	166,628,238	(5,970,607)	(2,663,564)
Income Taxes Deferred in Prior Years -----	(4,303,506)	(4,093,387)	(212,557)	2,438
Investment Tax Credit Adjustments-Net -----	(4,076,735)	(5,444,725)	1,382,434	(14,444)
<u>Total Taxes</u> -----	430,605,360	381,590,160	44,581,543	4,433,657
Loss on Disposition of Utility Plant -----	(225,766)	(225,766)	-	-
Total Operating Expenses -----	2,376,859,010	1,871,578,064	425,591,402	79,689,544
Operating Income -----	\$ 430,567,114	\$ 395,825,050	\$ 30,307,428	\$ 4,434,636
<u>OTHER INCOME</u>				
Allowance for Other Funds Used During Construction -----	123,089,789			
Other Income and Deductions - Net -----	103,894,838			
Total Other Income -----	226,984,627			
Income Before Interest Charges -----	657,551,741			
<u>INTEREST CHARGES</u>				
Long-Term Debt -----	360,552,488			
Amortization of Debt Discount, Premium & Expense -----	1,325,865			
Interest on Short Term Debt -----	20,232,386			
Other Interest Expense -----	15,652,336			
Allowance for Borrowed Funds Used During Construction -----	(192,243,809)			
Total Interest Charges -----	205,519,266			
Net Income -----	\$452,032,475			

Attachment 1 D-8-1

PHILADELPHIA ELECTRIC COMPANY
INCOME STATEMENT
12 MONTHS ENDED JUNE 30, 1983

	Total	Electric	Gas	Steam
OPERATING REVENUE -----	<u>\$2,576,310,948</u>	<u>\$2,098,322,687</u>	<u>\$410,463,969</u>	<u>\$67,524,292</u>
OPERATING EXPENSES				
Operation and Maintenance -----	1,673,796,997	1,277,745,189	330,671,407	65,380,401
Depreciation -----	142,577,104	129,382,485	11,480,196	1,714,423
Amortization of Other Electric Plant -----	(641,122)	(641,122)	-	-
Amortization of Property Losses -----	3,602,000	2,781,000	821,000	-
Taxes				
Pennsylvania Corporate Net Income Tax -----	29,939,874	28,316,612	1,523,665	99,597
Federal Corporate Income Tax -----	66,664,522	60,060,607	6,097,726	506,189
Other State and Local Income Taxes -----	1,324,374	1,324,374	-	-
Other Than Income				
Pennsylvania Gross Receipts Tax -----	105,920,779	87,727,945	18,192,834	-
Pennsylvania Capital Stock Tax -----	17,685,276	16,599,326	943,433	142,517
Pennsylvania Real Estate Tax -----	28,094,982	27,863,434	172,259	59,289
All Other -----	18,428,715	15,995,876	2,099,783	333,056
Provision for Deferred Income Taxes -----	58,599,166	49,324,909	10,461,150	(1,186,893)
Income Taxes Deferred in Prior Years -----	(3,682,648)	(3,494,061)	(187,859)	(728)
Investment Tax Credit Adjustments -----	48,717,749	48,862,467	(128,815)	(15,903)
Total Taxes -----	371,692,789	332,581,489	39,581,489	(62,876)
Loss on Disposition of Utility Plant -----	81,934	81,934	-	-
Total Operating Expenses -----	<u>2,191,109,722</u>	<u>1,741,930,995</u>	<u>382,146,779</u>	<u>67,031,948</u>
Operating Income -----	<u>\$ 385,201,226</u>	<u>\$ 356,391,692</u>	<u>\$ 28,317,190</u>	<u>\$ 492,344</u>
OTHER INCOME				
Allowance for Other Funds Used During				
Construction -----	88,016,568			
Other Income and Deductions - Net -----	83,759,376			
Total Other Income -----	<u>171,775,944</u>			
Income Before Interest Charges -----	<u>556,977,170</u>			
INTEREST CHARGES				
Long-Term Debt -----	317,567,601			
Amortization of Debt Discount, Premium				
& Expense -----	1,285,697			
Amortization of Gain or Loss on Recquired Debt				
- Other Interest Expense -----	29,818,488			
Allowance for Borrowed Funds Used During				
Construction -----	(153,772,454)			
Total Interest Charges -----	<u>194,899,332</u>			
Net Income -----	<u>\$362,077,838</u>			

- Q.1. Provide the following unadjusted detailed schedules by function and by FERC account for the claimed test year and for each of the three preceding comparable years:

Plant in service.

- A.1. Pages B-3 to B-6 of Exhibits TPH-1 and TPH-2 provide the requested Electric and Common Plant in Service data for the test years ending 6/30/85 and 6/30/86. Attachment VI-C-1 provides the requested Electric and Common Plant in Service data for the fiscal years ending 6/30/83 and 6/30/84.

Philadelphia Electric Company - Electric Operations
Electric Plant
Asset Balances as of June 30, 1983
and June 30, 1984
(Thousand \$)

	<u>June 30,</u> 1983	<u>June 30,</u> 1984
<u>Electric Plant In Service</u>		
<u>Intangible Plant</u>		
302. Franchises and Consents -----	\$163	\$163
<u>Production Plant</u>		
<u>Steam Production Plant</u>		
310. Land and Land Rights -----	7,598	7,598
311. Structures and Improvements -----	227,941	229,023
312. Boiler Plant Equipment -----	621,839	616,509
314. Turbogenerator Units -----	178,771	179,504
315. Accessory Electric Equipment -----	120,962	116,683
316. Miscellaneous Power Plant Equipment -----	11,885	12,833
Total Steam Production Plant -----	\$1,168,996	\$1,162,150
<u>Nuclear Production</u>		
320. Land and Land Rights -----	332	332
321. Structures and Improvements -----	283,829	295,085
322. Reactor Plant Equipment -----	559,770	577,629
323. Turbogenerator Units -----	199,332	203,192
324. Accessory Electric Equipment -----	167,752	173,058
325. Miscellaneous Power Plant Equipment -----	36,248	41,081
Total Nuclear Production Plant -----	\$1,247,263	\$1,290,377
<u>Hydraulic Production</u>		
330. Land and Land Rights -----	1,421	1,421
331. Structures and Improvements -----	14,474	14,484
332. Reservoirs, Dams and Waterways -----	34,292	34,292
333. Water Wheels, Turbines and Generators -----	21,891	21,971
334. Accessory Electric Equipment -----	7,994	8,644
335. Miscellaneous Power Plant Equipment -----	2,777	2,036
336. Roads, Railroads and Bridges -----	998	998
Total Hydraulic Production Plant -----	\$83,847	\$83,846
<u>Other Production Plant</u>		
340. Land and Land Rights -----	855	849
341. Structures and Improvements -----	4,466	4,406
342. Fuel Holders, Producers and Accessories -----	25,308	22,448
343. Prime Movers -----	-	-
344. Generators -----	90,175	90,903
345. Accessory Electric Equipment -----	13,339	13,064
346. Miscellaneous Power Plant Equipment -----	2,272	2,277
Total Other Production Plant -----	\$136,415	\$133,947
<u>Total Production Plant</u> -----	<u>\$2,636,521</u>	<u>\$2,670,320</u>

Philadelphia Electric Company - Electric Operations
Electric Plant
Asset Balances as of June 30, 1983
and June 30, 1984
(Thousand \$)

<u>Electric Plant In Service (Continued)</u>	<u>June 31, 1983</u>	<u>June 31, 1984</u>
<u>Transmission Plant</u>		
350. Land and Land Rights -----	48,471	46,355
352. Structures and Improvements -----	14,061	15,075
353. Station Equipment -----	205,897	220,347
354. Towers and Fixtures -----	152,908	171,360
355. Poles and Fixtures -----	414	444
356. Overhead Conductors and Devices -----	73,605	77,200
357. Underground Conduit -----	2,521	2,521
358. Underground Conductors and Devices -----	33,596	33,825
359. Roads and Trails -----	1,555	1,730
Total Transmission Plant -----	\$533,028	\$568,857
<u>Distribution Plant</u>		
360. Land and Land Rights -----	19,763	20,230
361. Structures and Improvements -----	36,429	36,721
362. Station Equipment -----	267,527	279,672
364. Poles, Towers and Fixtures -----	117,654	123,670
365. Overhead Conductors and Devices -----	181,992	189,069
366. Underground Conduit -----	134,776	137,865
367. Underground Conductors and Devices -----	223,296	237,739
368. Line Transformers -----	138,350	144,930
369. Services -----	82,534	89,145
370. Meters -----	79,189	83,869
371. Installations on Customers' Premises -----	276	276
373. Street Lighting and Signal Systems -----	23,351	24,896
Total Distribution Plant -----	\$1,305,137	\$1,368,082
<u>General Plant</u>		
389. Land and Land Rights -----	1,861	1,716
390. Structures and Improvements -----	13,737	13,910
391. Office Furniture & Equipment -----	27	799
393. Stores Equipment -----	400	406
394. Tools, Shop and Garage Equipment -----	4,324	4,510
395. Laboratory Equipment -----	5,875	6,518
397. Communication Equipment -----	809	863
398. Miscellaneous Equipment -----	930	926
Sub-Total	\$27,963	\$29,648
399. Other Tangible Property Anti-trust Price Adjustment -----	(3,957)	(3,316)
Total General Plant -----	\$24,007	\$26,332
Total Electric Plant In Service (carried forward) -----	\$4,498,855	\$4,633,754

Philadelphia Electric Company - Electric Operations

Common Plant
 Asset Balances as of June 30, 1983
 and June 30, 1984
 (Thousand \$)

	<u>June 30,</u> <u>1983</u>	<u>June 30,</u> <u>1984</u>
<u>Common Plant In Service</u>		
<u>Intangible Plant</u>		
301 Organization -----	\$677	\$677
<u>General Plant</u>		
389 Land & Land Rights -----	2,338	2,377
390 Structures and Improvements -----	79,728	81,784
391 Office Furniture and Equipment -----	19,775	18,623
392 Transportation Equipment -----	12,183	10,328
393 Stores Equipment -----	1,754	1,762
394 Tools, Shop and Garage Equipment -----	5,870	6,395
396 Power Operated Equipment -----	1,739	1,564
397 Communication Equipment -----	1,961	1,850
398 Miscellaneous Equipment -----	<u>2,061</u>	<u>2,169</u>
Total General Plant -----	\$127,409	\$126,852
Total Common Plant -----	\$128,086	\$127,529

Q.1. Provide the following unadjusted detailed schedules by function and by FERC account for the claimed test year and for each of the three preceding comparable years:

Accumulated depreciation.

A.1. Effective with the Commission Order at Docket R-842590 (January 25, 1985), the Company began to maintain book depreciation reserve information by plant accounts for electric and common plant. Pages C-2 through C-3b of Exhibits TPH-1 and TPH-2 provide the requested data for the test years ending 6/30/85 and 6/30/86 respectively. Attachment VI-D-1 provides an estimate of the requested data for the fiscal years ending 6/30/83 and 6/30/84.

Philadelphia Electric Company - Electric Operations
Electric Plant
Estimated Reserve Balances as of June 30, 1983
and June 30, 1984
(Thousand \$)

	<u>June 30,</u> 1983	<u>June 30,</u> 1984
<u>Electric Plant In Service</u>		
<u>Intangible Plant</u>		
302. Franchises and Consents -----	-	-
<u>Production Plant</u>		
<u>Steam Production Plant</u>		
310. Land and Land Rights -----	-	-
311. Structures and Improvements -----	\$87,246	\$94,973
312. Boiler Plant Equipment -----	217,297	243,314
314. Turbogenerator Units -----	90,872	96,462
315. Accessory Electric Equipment -----	59,136	62,535
316. Miscellaneous Power Plant Equipment -----	<u>7,004</u>	<u>7,383</u>
Total Steam Production Plant -----	\$461,555	\$504,667
<u>Nuclear Production</u>		
320. Land and Land Rights -----	-	-
321. Structures and Improvements -----	\$47,182	\$55,682
322. Reactor Plant Equipment -----	65,804	83,470
323. Turbogenerator Units -----	28,226	32,158
324. Accessory Electric Equipment -----	21,280	26,480
325. Miscellaneous Power Plant Equipment -----	<u>5,148</u>	<u>6,243</u>
Total Nuclear Production Plant -----	\$167,640	\$204,033
<u>Hydraulic Production</u>		
330. Land and Land Rights -----	-	-
331. Structures and Improvements -----	\$3,540	\$3,704
332. Reservoirs, Dams and Waterways -----	5,380	5,724
333. Water Wheels, Turbines and Generators -----	4,410	4,856
334. Accessory Electric Equipment -----	2,205	2,367
335. Miscellaneous Power Plant Equipment -----	662	724
336. Roads, Railroads and Bridges -----	<u>491</u>	<u>507</u>
Total Hydraulic Production Plant -----	\$16,688	\$17,882
<u>Other Production Plant</u>		
340. Land and Land Rights -----	-	-
341. Structures and Improvements -----	\$2,424	\$2,580
342. Fuel Holders, Producers and Accessories -----	3,749	7,134
343. Prime Movers -----	-	-
344. Generators -----	38,550	38,902
345. Accessory Electric Equipment -----	4,506	4,973
346. Miscellaneous Power Plant Equipment -----	<u>448</u>	<u>543</u>
Total Other Production Plant -----	\$49,677	\$54,132
<u>Total Production Plant</u> -----	\$695,560	\$780,714

Philadelphia Electric Company - Electric Operations
Electric Plant
Estimated Reserve Balances as of June 30, 1983
and June 30, 1984
(Thousand \$)

<u>Electric Plant In Service (Continued)</u>	<u>June 30,</u> <u>1983</u>	<u>June 30,</u> <u>1984</u>
<u>Transmission Plant</u>		
350. Land and Land Rights -----	-	-
352. Structures and Improvements -----	4,080	4,321
353. Station Equipment -----	72,949	77,128
354. Towers and Fixtures -----	35,517	40,249
355. Poles and Fixtures -----	212	231
356. Overhead Conductors and Devices -----	22,139	23,562
357. Underground Conduit -----	1,537	1,588
358. Underground Conductors and Devices -----	20,503	21,380
359. Roads and Trails -----	485	579
Total Transmission Plant -----	\$157,422	\$169,038
<u>Distribution Plant</u>		
360. Land and Land Rights -----	-	-
361. Structures and Improvements -----	11,343	14,139
362. Station Equipment -----	125,325	134,695
364. Poles, Towers and Fixtures -----	43,968	46,009
365. Overhead Conductors and Devices -----	69,984	74,165
366. Underground Conduit -----	41,475	44,002
367. Underground Conductors and Devices -----	69,088	71,983
368. Line Transformers -----	44,396	47,923
369. Services -----	23,868	26,334
370. Meters -----	20,012	20,326
371. Installations on Customers' Premises -----	181	185
373. Street Lighting and Signal Systems -----	7,047	7,852
Total Distribution Plant -----	\$456,687	\$487,613
<u>General Plant</u>		
389. Land and Land Rights -----	-	-
390. Structures and Improvements -----	\$4,882	\$4,893
391. Office Furniture & Equipment -----	-	6
393. Stores Equipment -----	147	166
394. Tools, Shop and Garage Equipment -----	1,746	1,828
395. Laboratory Equipment -----	2,032	2,009
397. Communication Equipment -----	439	288
398. Miscellaneous Equipment -----	621	606
Sub-Total -----	\$9,867	\$9,796
399. Other Tangible Property Anti-trust Price Adjustment -----	-	-
Total General Plant -----	\$9,867	\$9,796
Total Electric Estimated Reserve Balance -----	\$1,319,536	\$1,447,161

Philadelphia Electric Company - Electric Operations

Common Plant
 Estimated Reserve Balances as of June 30, 1983
 and June 30, 1984
 (Thousand \$)

	<u>June 30,</u> <u>1983</u>	<u>June 30,</u> <u>1984</u>
<u>Common Plant In Service</u>		
<u>Intangible Plant</u>		
301 Organization -----	-	-
<u>General Plant</u>		
389 Land & Land Rights -----	-	-
390 Structures and Improvements -----	25,021	27,516
391 Office Furniture and Equipment -----	2,596	4,774
392 Transportation Equipment -----	7,939	6,726
393 Stores Equipment -----	397	474
394 Tools, Shop and Garage Equipment -----	2,358	2,537
396 Power Operated Equipment -----	1,212	1,201
397 Communication Equipment -----	215	367
398 Miscellaneous Equipment -----	<u>1,518</u>	<u>1,625</u>
Total General Plant -----	\$41,256	\$45,220
Total Common Estimated Reserve Balance---	\$41,256	\$45,220

ORIGINAL

PECO EXHIBIT NO. 2

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SEP 27 1985

SECRETARY'S OFFICE

Public Utility Commission

PENNSYLVANIA PUBLIC UTILITY COMMISSION

v.

PHILADELPHIA ELECTRIC COMPANY,
DOCKET NO. R-850152

LIMERICK 1 AND COMMON PLANT
EXPLANATION OF REASONS FOR COST AND
SCHEDULE GROWTH, INCLUDING DATA
ON THE EFFECT OF NEW AND REVISED
REGULATORY REQUIREMENTS

September 27, 1985

DOCKETED
R-850152

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I. INTRODUCTION

This Exhibit has been prepared to explain the reasons for cost and schedule growth of Limerick 1 and Common Plant. The cost analyses supporting Section II were developed jointly by TB&A and PECO. TB&A, however, provided overall direction for this analysis. The analysis presented in Section III was prepared by PECO. Both analyses and the specific contributions made by the individual organizations identified are described in the testimony of PECO witnesses Love, Kemper, Clarey, Helwig, and Sproat.

As demonstrated in Section II of this Exhibit, a primary cause of cost and schedule growth of Limerick 1 and Common Plant was the issuance of new and revised NRC regulatory requirements in the form of new regulations, regulatory guides, standard review plans, generic letters, NUREG documents and I&E bulletins and information notices, etc. The extent and timing of these new NRC requirements and the manner of their application to Limerick is described in the testimony of Dr. Roger J. Mattson, a former senior NRC official.

Section III provides additional data with respect to the impact of these new requirements upon the Project. Section III also presents an analysis of the dates upon which a number of specific, new NRC requirements were imposed on the project and the time periods necessary for completion of the required engineering and construction. Additionally, data is presented with respect to specific plant additions necessary for compliance with these requirements and the relationship of commodity and manhour growth to changes in regulatory requirements. The data presented in Section III is further discussed in the testimony of witnesses Boyer, Clarey, Helwig, and Sproat.

1 In addition to regulatory impacts, further causes of cost and schedule
2 growth are shown to be funding constraints upon the project, labor unavailability,
3 and less than anticipated labor effectiveness. Data relative to these causes are
4 also set forth in both Section II and Section III of the Exhibit and are discussed in
5 the testimony of witnesses Boyer, Kemper, Paquette, Clarey, and Love.
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12 **II. EXPLANATION OF REASONS FOR COST GROWTH**
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14
15 **A. Introduction**
16

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18 This explanation is presented by dividing cost growth into the
19 following categories:
20

- 21
22
23 • Cost Impact of Regulatory and Other Externally-Imposed
24 Conditions
25
26 • Cost Impact of Design Changes to Facilitate Plant Operability
27 and Reliability
28
29 • Cost Increases Due to Estimate Refinements and Other Causes
30
31 • Cost Impact of Unanticipated Escalation
32

33 A summary of the costs determined to be associated with each
34 category is presented in Schedule 1.
35
36

37
38 **B. Cost Impact of Regulatory and Other Externally-**
39 **Imposed Changes**
40

- 41
42 1. **TMI-2 ANALYSES AND DESIGN CHANGES** \$57.5 Million
43
44

45 The Three Mile Island, Unit 2 (TMI-2) incident had a significant
46 impact on light water reactor (LWR) construction and operations cost. Following
47 TMI-2, various panels within the NRC, such as the Lessons Learned Task Force
48
49
50

LIMERICK UNIT 1 & COMMON
COST GROWTH RECONCILIATION

(\$ in Millions)

Original PECO Capital Authorization
Unit 1 and Common, Direct Costs

\$344.1

Regulatory and other Externally - Imposed
Conditions

- TMI-2 Analyses and Design Changes	57.5
- Plant Staffing, Startup and Training	181.6
- Seismicity	119.6
- Impact of Mark II	136.1
- Fire Protection & Electrical Separation	65.8
- Equipment Qualification	38.6
- Anticipated Transients Without Scram	20.9
- ALARA & OSHA	39.6
- ASME Code Requirements	20.9
- Security Requirements	43.5
- Intergranular Stress Corrosion Cracking	10.2
- Licensing Costs	62.9
- Miscellaneous Other NRC Regulations	116.3
- Non-NRC Requirements	63.8
- Cost Impact of Schedule Delays Due to Licensing Delays and Other Factors	<u>385.1</u>

1362.4

Design Changes To Facilitate
Operability and Reliability

111.9

Estimate Refinements and Other
Causes

208.6

Unanticipated Escalation

322.1

DIRECT COST RECONCILIATION TOTAL

\$2349.1

1 and Emergency Preparedness Task Force, reviewed the incident and issued
2 findings and recommendations in the form of NUREG reports. These requirements
3 were for the most part detailed in NUREGs -0578, -0654, -0660, -0696, -0700,
4 -0737, revisions to Regulatory Guide 1.97, amendment of 10CFR50 Appendix E,
5 and Supplement 1 to NUREG -0737 which were issued during the period July 1979
6 to May 1983.
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13 Examples of Limerick design changes as a result of these
14 requirements are as follows:
15

- 16 • Post-Accident Sampling System (PASS) added in accordance
17 with NUREG-0737, Item II.B.3;
- 18 • Accident monitoring equipment upgraded and new equipment
19 added per NUREG-0737, Item II.F.1 and Regulatory Guide 1.97,
20 Rev. 2;
- 21 • Automatic closing of drywell purge isolation valves on a high
22 radiation signal added in response to NUREG-0737, Item
23 II.E.4.2(7);
- 24 • A control room design review (CRDR) was performed and
25 resultant changes implemented as per NUREG-0737, Item
26 I.D.1, as further clarified by Supplement 1 to NUREG-0737;
- 27 • Technical Support Center (TSC) added in accordance with
28 NUREG-0737, Item III.A.1.2;
- 29 • Computer and software for offsite dose assessment added in
30 compliance with NUREG-0737, Item III.A.2.2, clarified by
31 NUREG-0737, Supplement 1;
- 32 • Added emergency microwave telecommunications system
33 between PECO main office, plant, and Emergency Operations
34 Facility (EOF) in accordance with NUREG-0654, Item E.1;
- 35 • Relocation of vent radiation monitoring equipment to provide
36 post-accident access per NUREG-0737, Items II.F.1 and II.B.1;
- 37 • System leakage study performed and modifications
38 implemented as per NUREG-0737, Item III.D.1.1;
- 39 • Emergency Response Facility Data System (ERFDS) added in
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1 compliance with NUREG-0737, Item I.D.2 to provide safety
2 parameter display system (SPDS), clarified by Supplement 1 to
3 NUREG-0737;
4

- 5 • Modifications to the high pressure coolant injection system and
6 reactor core isolation cooling system (HPCI/RCIC) in
7 accordance with NUREG-0737, Items II.K.3.15 and II.K.3.22;
8
- 9 • Emergency public notification system added per 10CFR50,
10 Appendix E;
11
- 12 • Modifications to the Automatic Depressurization System (ADS)
13 logic per NUREG-0737, Item II.K.3.18;
14
- 15 • Added Seismic Class I air supply system to the ADS valves per
16 NUREG-0737, Item II.K.3.28;
17
- 18 • Purchase and installation of a Safety Relief Valve Position
19 Indication System per NUREG-0737, Item II.D.3;
20
- 21 • Isolation signal reset interlocks added to safety feature
22 systems per NUREG-0737, Item II.E.4.2;
23
- 24 • Operations Support Center added per NUREG-0737, Item
25 III.A.1.2;
26
- 27 • Development and implementation of emergency procedures per
28 NUREG-0737, Item I.C.1, as further clarified by Supplement 1
29 to NUREG-0737.
30

31
32 The effects of the TMI-2 incident upon project cost and schedule
33 exceed actual hardware and engineering analyses accounted for in this
34 subsection. Substantial cost additions set forth in Subsection 2 of this testimony,
35 reflecting increases in plant staffing, startup and training, are also attributable to
36 new requirements or revised interpretations of existing requirements adopted
37 because of TMI-2. Further, one of the most significant indirect impacts of TMI-2
38 was a heightened level of regulatory awareness and scrutiny, which significantly
39 impacted project cost.
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1 2. PLANT STAFFING, STARTUP, AND TRAINING \$181.6 Million
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4 Project costs increased substantially relative to the original
5
6 December 1970 estimate due to increased requirements in the areas of staffing,
7
8 startup, and training. For instance, startup test procedure preparation and review
9
10 process requirements are far more extensive than those in effect at the time of
11
12 the original cost estimate. Hence, manpower requirements were considerably
13
14 greater than originally estimated. Additionally, requirements for operations
15
16 personnel, operating procedures, and operator training have greatly expanded
17
18 since the TMI-2 incident.
19

20 The following are examples of changes in staffing, startup, and
21
22 training due to increased requirements:
23

- 24 • Expanded startup and power ascension testing programs
25 required in accordance with Regulatory Guide 1.68, Revision 2,
26 Revision of Standard Review Plan Section 14 and Regulatory
27 Guide 1.108;
- 28 • Independent Safety Engineering Group required per NUREG-
29 0737, Item I.B.1.2;
- 30 • Fire Protection assistant added to the plant operations staff in
31 response to SRP Section 9.5.1 and BTP CMEB 9.5-1;
- 32 • Shift Technical Advisors added per NUREG-0737, Item I.A.1.1;
- 33 • Reactor operator training and qualifications upgraded per
34 NUREG-0737, Item I.A.2.1;
- 35 • Shift staffing, overtime, and turnover practices revised per
36 NUREG-0737, Items I.A.1.3. and I.C.2;
- 37 • Operations Experience Assessment Committee established in
38 response to NUREG-0737, Item I.C.5;
- 39 • Increased training for the mitigation of core damage events
40 provided per NUREG-0737, Item II.B.4;
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- Staffing increases needed to handle expanded NRC requirements for documentation and reporting.
- Increased size of administration complex based on additional staffing requirements.
- Increased number of procedures required due to NRC expansion of the scope of plant Technical Specifications.

3. SEISMICITY \$119.6 Million

Major requirements for seismic design classification impacting Limerick are detailed in Regulatory Guide 1.29. This guide, adopted in June 1972 and revised as late as 1978, describes an acceptable method of identifying and classifying those features which should be designed to allow the plant to be safely shutdown in the event of an earthquake. Compliance with Regulatory Guide 1.29 was extremely costly in that numerous supports for piping, electrical equipment, and HVAC were impacted in terms of requirements for additional engineering analysis, and labor manhours required for the installation and modification of supports and hangers.

The AEC/NRC dictated several significant changes to the Limerick seismic design basis after the Preliminary Safety Analysis Report (PSAR) was docketed in February of 1970. Many of these changes were due to NRC and ACRS concerns about the ability of nuclear power plants to withstand seismic events, concurrent with keeping safety-related systems and components functional. These changes, all of which defined more conservative seismic loads to be used for the design of Limerick, included:

- Vertical direction seismic analysis for all safety-related structures;

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- Twenty-five (25) percent increase in maximum ground acceleration for the design basis earthquake;
 - Three earthquake component combinations for design of piping systems per requirements of Regulatory Guide 1.92.

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These criteria changes resulted in structural design changes, while the increase in seismic response had a major impact in terms of costs on plant systems, components and equipment which necessitated increases in strength, number and size of components and supports.

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Examples of design analyses and field changes made at Limerick in response to the seismic design requirement changes include:

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- Upgrading of HVAC ductwork (relative to Peach Bottom) to Seismic Class I in the reactor enclosure and control structure per PSAR commitment and Regulatory Guide 1.29;
 - Increases in structural steel in the reactor enclosure to satisfy seismic criteria;
 - Increased metal conduit and cable tray installation cost to allow for Seismic Class I supports due to increased seismic response spectra and ground acceleration value;
 - Increased installation manhours for all conduit, instrument tray, piping and tubing supports due to increased congestion and complexity;
 - Control room ceilings upgraded from Seismic Class II to Special Class IIA in compliance with Regulatory Guide 1.29;
 - Hanger and snubber quantity increases resulting from decreased hanger spacing due to revised seismic loads;
 - Changes in unit cost and fabrication of large pipe and hanger material due to reassessment of dynamic loads.

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These new or revised seismic design requirements were imposed during the period June 1972 to September 1978.

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4. IMPACT OF MARK II

\$136.1 Million

A new category of load phenomena associated with BWR Mark II containments was identified in 1975. This was comprised of the hydrodynamic loading conditions during a safety relief valve (SRV) discharge or loss-of-coolant accident (LOCA). These hydrodynamic SRV and LOCA loads have come to be known simply as Mark II loads.

Various requirements have been issued by the NRC concerning acceptable means of addressing these loads by owners of BWR Mark IIs. These include NUREGs -0487, -0763, -0783, -0802, and -0808. As a result of these requirements, a number of analyses and design changes were made at Limerick.

Examples of these include:

- Engineering to evaluate the suppression pool swell phenomenon, perform containment analysis, provide technical support to the BWR Mark II Owner's Group, and conduct plant unique analysis and support design. These analyses included:
 - fatigue evaluation of downcomer and SRV lines;
 - analysis of wetwell and drywell vacuum breakers;
 - analysis of shroud support legs;
 - asymmetric SRV acceleration time histories and response spectra analysis.
- Modifications to seismic structures adjacent to the containment to account for hydrodynamic loadings;
- Field modifications and installation costs associated with the re-evaluation of design loading requirements for pipe supports and piping systems, including the addition of hangers and other materials such as snubbers and struts.

These Mark II-related NRC requirements were issued during the period 1978 to 1982.

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5. FIRE PROTECTION AND
ELECTRICAL SEPARATION

\$65.8 Million

Following the Browns Ferry Nuclear Power Plant fire in 1975, the NRC made a comprehensive evaluation of the design criteria for fire protection at nuclear power plants. The major regulatory requirement that resulted from this review was 10CFR50.48. Appendix R to 10CFR50, although not directly applicable to Limerick by regulation, was the basis for Standard Review Plan Section 9.5.1 and Branch Technical Position (BTP) CMEB 9.5-1, against which the Limerick design was reviewed. The requirements contained in this document are intended to ensure that, in the event of a fire, personnel and plant equipment would be adequate to safely shutdown the reactor, and to maintain the plant in a safe shutdown condition.

Electrical separation requirements in the form of Regulatory Guide 1.75 also impacted the Limerick design by requiring the redesign and rework of raceway and control systems to achieve physical independence of safety-related circuits and electrical equipment.

The following are examples of the regulatory impacts stemming from BTP CMEB 9.5-1 (fire protection), and Regulatory Guide 1.75 (electrical separation):

BTP CMEB 9.5-1

- Fire protection changes and modifications pertaining to the separation of safe shutdown circuits, namely: fireproofing of cable tray, added cable tray supports, additional sprinkler systems, modifications to existing fire protection systems, increased structural steel fireproofing, penetration sealing and fire protection of wall gaps, and relocation of equipment from hazardous areas;
- Addition of automatically initiated, permanently installed Halon 1301 fire suppression system on the PGCC.

- Qualification and/or modification, replacement, or relocation of equipment to meet environmental conditions in compliance with NUREG-0588 and 10CFR50.49;
- Plant design changes associated with replacement or relocation of equipment due to qualification;
- Evaluations to determine reactor building environmental conditions under various conditions;
- Qualification and/or modification, replacement or relocation of equipment to meet dynamic conditions in compliance with Regulatory Guide 1.100 including analyses of equipment for Mark II dynamic loads and seismic qualification (SQRT) reviews.

These requirements were imposed, during the period 1980 to 1983.

7. ANTICIPATED TRANSIENTS WITHOUT SCRAM \$20.9 Million

An Anticipated Transient Without Scram (ATWS) occurs when the control rods fail to insert as a result of an undefined common mode failure when a reactor scram signal is initiated.

In December 1978, Volume 3 of NUREG-0460, "Anticipated Transients Without Scram for Light-Water Reactors" was issued describing the proposed plant modifications the NRC staff considered necessary to reduce the risk from ATWS to an acceptable level. In response to the NRC's concern with the ATWS issue, the following features were included in the Limerick design:

- Lower main steam line isolation valve isolation setpoint;
- High pressure coolant injection system flow split;
- Redundant reactivity control system for:
 - (1) Alternate rod insertion
 - (2) Recirculation pump trip
 - (3) Automatic initiation of standby liquid control with improved injection flow path;
- Additional uninterruptible power supply.

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8. AS LOW AS REASONABLY
ACHIEVABLE (ALARA) AND OSHA

\$39.6 Million

The NRC requires that all nuclear power plants be designed so that radiation protection measures are taken to ensure that internal and external dosages to plant personnel and contractors as a result of plant conditions, will be within the limits established by 10CFR20. This regulation addresses and details the requirements for:

- Determination of accumulated doses;
- Individual exposures to concentrations of radioactive materials in the air in restricted areas;
- Radioactivity in effluents to unrestricted areas;
- Surveys of radiation hazards;
- Personnel monitoring;
- Caution signs, labels, signals, and controls;
- Waste disposal;
- Records, reports, and notification;
- Enforcement.

Regulatory Guide 8.8 provides more detailed guidance relevant to attaining goals and objectives for planning, designing, constructing, operating, and decommissioning a light-water reactor nuclear power plant. The goals of both Regulatory Guide 8.8 and 10CFR20 are to keep the annual integrated (collective) dose to station personnel as low as is reasonably achievable (ALARA).

Modifications to the Limerick Station design as a result of these requirements include:

- Reviews, identification, purchase, and installation of radiation shielding associated with potential radiological exposure areas;

- 1 • Modifications to the breathing air system to prevent
2 radioactive contamination;
3
4 • Special coatings in radiation areas to facilitate
5 decontamination and cleanup;
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7 • Relocation of instruments to low radiation areas.
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10 Compliance with OSHA requirements for worker safety also impacted
11 station costs. Examples of required compliance measures include:
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- 13 • Eye protection for craftsmen;
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15 • Increased lighting fixture quantities;
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17 • Added room signs, identification signs, directional and
18 elevation signs;
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20 • Additional personnel access platforms.
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24 9. ASME CODE REQUIREMENTS \$20.9 Million
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27 ASME Code requirements increased substantially during the design,
28 procurement, and construction of the Limerick project. At the time of initial
29 project design and cost estimates, the ASME Code Sections pertaining to Nuclear
30 Power Plant Components were in the developmental stage and thus, their full
31 impact could not be accurately anticipated. Examples of areas where the
32 evolution of applicable ASME code requirements increased project costs are as
33 follows:
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41 • Preparation of nuclear piping design specifications;
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43 • Additional weld preparation for non-destructive examination;
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45 • Additional non-destructive examination;
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47 • Additional stress analyses of piping and hangers;
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49 • Preservice inspection.
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1 the plant is operational. Subsequent regulatory requirements for dealing with this
2 problem contained in NUREG-0313 and NUREG-1061, were satisfied by this
3 action.
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8 12. LICENSING COSTS \$62.9 Million
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10 Changes and additional evaluations which were required during the
11 Limerick licensing process contributed towards additional project cost increases.
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13 Examples of these necessitated changes are:
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- 15 • Use of a new format and context requirement for preparation
16 of the FSAR;
- 17 • Additional geological investigations;
- 18 • Completion of a control systems interaction study in response
19 to questions regarding USI A-49;
- 20 • Preparation and defense of a Probabilistic Risk Analysis (PRA);
- 21 • Completion of an Independent Design Verification Program
22 (IDVP);
- 23 • Hardening of the reactor enclosure to withstand aircraft
24 impact;
- 25 • Missile protection of the refueling floor;
- 26 • Increased cost of snubber exercising per I&E Bulletin 81-01.

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28 13. MISCELLANEOUS OTHER NRC REQUIREMENTS \$116.3 Million
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30 A large number of plant design changes were required due to changes
31 in NRC requirements which do not have a central theme or purpose, such as those
32 itemized in separate sections above. Examples of such changes are indicated
33 below:
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- 35 • Increased monitoring of effluents per 10CFR50, Appendix I;

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- Modifications to facilitate containment leak testing per 10CFR50, Appendix J;
- Addition of an ultimate heat sink complying with Regulatory Guide 1.27;
- Expanded interpretation of quality assurance program requirements per 10CFR50, Appendix B;
- Concrete anchor bolt test program per I&E Bulletin 79-02;
- Additional diesel generators provided per Regulatory Guide 1.81;
- Addition of an MSIV leakage collection system per Regulatory Guide 1.96;
- Inclusion of an augmented offgas system per 10CFR50.34a;
- Improvement of leakage detection capability per Regulatory Guide 1.45;
- Use of high density spent fuel storage racks (because reprocessing is unavailable);
- Masonry wall modifications per I&E Bulletin 80-11;
- Addition of a loose parts monitoring system in compliance with Regulatory Guide 1.133;
- Analysis of high and moderate energy line breaks and subsequent plant changes per BTP ASB 3-1, and BTP MEB 3-1;
- Design changes for control room habitability per Regulatory Guide 1.78;
- Addition of radwaste solidification equipment per 10CFR61.

14. NON-NRC REQUIREMENTS \$63.8 Million

Requirements imposed by entities other than the NRC caused increases in project costs. Revised or new requirements from the EPA, PaDER, and ANI in areas such as effluent limitations, erosion control, flood plain management, and worker safety all contributed to project cost increases. In

1 addition, various unanticipated increases in taxes and other items were imposed
2 upon the project.
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6 15. COST IMPACT OF SCHEDULE EXTENSIONS
7 DUE TO LICENSING DELAYS AND
8 OTHER FACTORS \$385.1 Million
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10 Delays in the construction and operating schedules resulted in time
11 related direct cost increases due to the prolonged period of equipment
12 maintenance and project staffing. Schedule extensions were experienced as a
13 result of:
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- 18 • Delays in receipt of a Construction Permit from the NRC;
 - 19 • Cash flow and financing constraints;
 - 20 • Limited availability of craft manpower;
 - 21 • Delays in receipt of the low power operating license from the
22 NRC;
 - 23 • The cumulative effects of regulatory change on project
24 engineering and construction;
 - 25 • Delays in receipt of the full power operating license from the
26 NRC.
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35 C. Cost Impact Of Design Changes To
36 Facilitate Operability And Reliability \$111.9 Million
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38 The three basic sources of non-regulatory-imposed design and work
39 scope changes on the Limerick Project were those initiated by the architect/
40 engineer/constructor, vendors, and PECO. Many changes in this cost causation
41 category were identified as being the result of operating experiences derived from
42 PECO's Peach Bottom BWR Units in addition to general industry operating
43 experience. The objective in making these changes was to enhance plant safety,
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1 reliability, and operability. Examples of such design and work scope changes are:

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- 3 • Change from hydraulic to mechanical snubbers;
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- 5 • Design modifications to small pipe vents and drains;
- 6
- 7 • Revised turbine drain design to prevent water induction into
- 8 the turbine based on a GE recommendation as a result of
- 9 industry operating experience;
- 10
- 11 • Addition of protective coating for the entire suppression pool;
- 12
- 13 • Rerouting of plant heating pipe, addition of steam traps and
- 14 condensate return units;
- 15
- 16 • Modifications to reactor feed pump seals, main condenser
- 17 internals, loop seals, vents and drains, HVAC systems and
- 18 turbine drains;
- 19
- 20 • Addition of an equipment vibration monitoring system;
- 21
- 22 • Utilization of three additional safety relief valves in lieu of
- 23 safety valves.
- 24

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26 D. Cost Increases Due To Estimate \$208.6 Million

27 Refinement And Other Causes

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30 Costs included in this section represent estimate adjustments and

31 re-evaluations, pricing changes, and other subcontract changes not wholly

32 attributable to specific causation factors. Certain of these cost changes resulted,

33 albeit indirectly, from changing regulatory requirements and other uncontrollable

34 factors described elsewhere.

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39 Examples of cost changes associated with this category are:

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- 41 • Addition of stainless steel liner for reactor well due to
- 42 estimate omission;
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- 44 • Re-evaluation of the concrete batch plant support operations,
- 45 including additional requirements for concrete trucks;
- 46
- 47 • Reduced weather protection costs based on fewer winter
- 48 placements;
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- Credit for pre-commercial power generation;
- Estimate adjustments based on actual contract awards.

E. Cost Impact Of Unanticipated Escalation \$322.1 Million

Costs included within this category are changes in the determination of escalation due to unanticipated inflation made throughout the project, unanticipated escalation associated with schedule extensions, and unanticipated changes in labor rates.

III. EFFECT OF NEW OR CHANGED NRC REQUIREMENTS UPON THE PROJECT

A. Summary of Analysis

An analysis was performed by PECO to evaluate the time durations necessary to identify, design and construct specific plant additions and modifications required by new or revised NRC requirements. The specific NRC requirements addressed in this analysis are those concerning anticipated transients without scram (ATWS); control room panel modifications; Mark II modifications; equipment qualification; TMI-2 additions and modifications such as a) emergency response facilities, b) safety parameter display system, c) radiological meteorological monitoring system, d) post-accident sampling system and e) SRV position indication; seismicity, fire protection; high and moderate energy line breaks; security; "as-built" pipe and pipe hanger reviews; masonry walls; and ASME Section III requirements.

The analysis identifies when major regulatory requirements affecting the project were imposed by the NRC, and when engineering and construction activities required as a result of these regulatory changes were completed in

1 relation to the overall project schedule. The results of this analysis are shown in
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3 Schedule 2.
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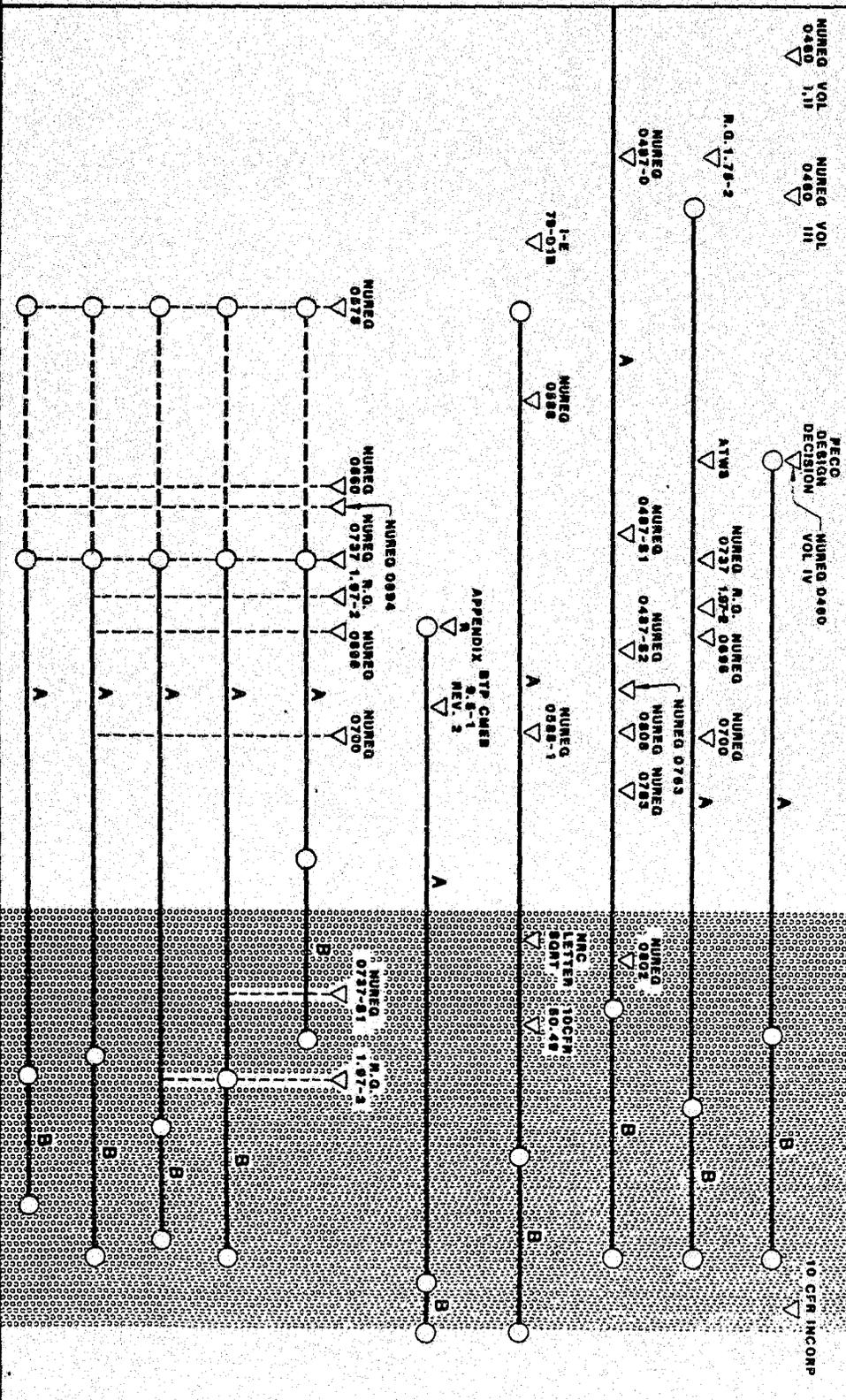
5 The information necessary for the completion of this analysis was
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7 obtained from a variety of sources. Information regarding the timing of specific
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9 regulatory requirements was obtained through reviews of project documentation
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11 and discussions with the cognizant PECO engineers. Durations for engineering
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13 activities were obtained through review of applicable engineering schedules
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15 supplemented by discussions with cognizant project personnel. Finally,
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17 construction activity durations were developed from a review of construction
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19 schedules and dialogues with cognizant site personnel. Time periods required for
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21 engineering are illustrated on Schedule 2 by line "A", while the durations
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23 necessary for procurement and construction are designated as line "B".
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25 The analysis demonstrates the impact of the volatile regulatory
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27 environment on the completion of project construction and startup activities. As
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29 such, it demonstrates that a large number of regulatory changes occurred between
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31 1979 and 1984, necessitating that engineering and construction activities extend
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33 well into the startup and preoperational test period. Because of the timing of
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35 these mandated changes, engineering manhours were frequently expended for the
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37 redesign of systems and equipment as well as for the design of new systems not
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39 originally anticipated. Hence, to minimize the impact on overall project
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41 completion, a "fast track" approach was required, i.e. construction activities were
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43 initiated as soon as a sufficient portion of the design was complete. This resulted
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45 in the removal and modification of previously installed items, the installation of
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47 additional materials and equipment in already congested plant areas due to the
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49 advanced stage of construction, and delays in overall construction completion and
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SCHEDULE 2

SCHEDULE EFFECT OF REGULATORY CHANGES

		ENERGIZE ▽				RPV HYDRO ▽				FUEL LOAD ▽					
		'78		'79		'80		'81		'82		'83		'84	
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- A. EMERGENCY RESPONSE FACILITY
- B. SPDS
- C. RMMS
- D. PASS
- E. MSRV POSITION INDICATION

LEGEND:

- - DESIGN PERIOD
- - MAT'L DEL. A COMPT
- - COMPLETION PERIOD
- ▽ - PRELIM. ENGR. CONTROL
- ▽ - STARTUP TESTING
- ▽ - ISSUE DATE

DESCRIPTION	REV	PLAN	SCHED	APPN	DATE	PROJECT:	TITLE:	SHEET
EXHIBIT 2 - SCHEDULE 2	0					LIMERICK 1	SCHEDULE EFFECT OF REGULATORY CHANGES	1 OF 12

1 turnover of systems to the startup group. The cumulative level of effort required
2 for the resolution of these items prohibited acceleration of construction
3 completion and startup testing activities much beyond that which was achieved.
4 Further, the late imposition of many of these regulatory mandated activities
5 caused less than optimal construction sequencing which adversely affected unit
6 rates.
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14 B. Details of Analysis
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17 This subsection provides additional data with respect to the effect
18 upon Limerick 1 and Common Plant of the new or revised regulatory requirements
19 identified on Schedule 2. These specific requirements and systems are discussed
20 in detail to provide explanations of their impact on the project.
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25 1. Analysis of Effects of Specific TMI Regulatory Requirements
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28 Following the incident at TMI-2, the activities of various NRC task
29 forces resulted in rapidly changing requirements in a number of different plant
30 areas. For example, on September 13, 1979, the NRC Staff issued
31 recommendations concerning shift technical advisors, shift supervisor
32 responsibilities, operating procedures, reactor coolant system vents, plant
33 shielding, post-accident surveys, relief and safety valve testing and position
34 indication, auxiliary feedwater system control and instrumentation, power for
35 pressurizer heaters, hydrogen recombiner penetrations, accident monitoring
36 instrumentation, instrumentation for the detection of inadequate core cooling,
37 emergency support facilities, and in-plant radiation monitoring.
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48 The various task force recommendations were codified in May 1980 as
49 NUREG-0660, "TMI-2 Action Plan". The stated objective of the Action Plan was
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1 to provide a comprehensive and integrated plan for the actions judged necessary
2 by the NRC Staff to resolve safety concerns raised by the TMI-2 incident. Some
3 of these requirements were imposed in June 1980, in NUREG-0694, "TMI-Related
4 Requirements for New Operating Licenses." Following NRC review of these
5 matters, NUREG-0737, "Clarification of TMI Action Plan Requirements" was
6 issued on October 31, 1980. NUREG-0737 incorporated some of the Staff
7 recommendations contained in NUREG-0660 and 0694. It effectively superseded
8 NUREG-0694 and was the vehicle for implementing the licensing requirements
9 contained in NUREG-0660. In addition, the NRC Staff was reorganized to add a
10 new division of human factors safety, and an emergency preparedness program
11 office was established in the Office of Inspection and Enforcement with related
12 licensing responsibilities transferred to that group.
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25 NUREG-0737 is applicable to both operating plants and plants under
26 construction and includes information about schedules, applicability, methods of
27 implementation review, submittal dates and clarification of technical positions.
28 While a large number of other NRC documents provide guidelines, clarifications,
29 and implementation details for post-TMI requirements, NUREG-0737 provides the
30 basic action items. Nevertheless, compliance with these basic action items
31 required that the applicant or licensee review the guidelines of the many
32 additional NRC documents.
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41 The NRC's objective in requiring these changes was to reduce the
42 frequency of events which might present challenges to plant safety systems and to
43 ensure proper operator reactions to such challenges when they do occur. Since the
44 TMI incident was complicated by shortcomings in operator performance, the NRC
45 sought to minimize the potential for human error by improving emergency
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1 procedures, training, staffing and the ability of plant operators to understand and
2
3 diagnose plant conditions.
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5 The first supplement to NUREG-0737 was issued in a generic letter
6 dated December 17, 1982, entitled "Requirements for Emergency Response
7 Capability". NUREG-0737, Supplement 1 proposed requirements for additional
8 instrumentation, communication equipment, design reviews and emergency
9 operating procedure improvements. Supplement 1 also proposed new requirements
10 for the Safety Parameter Display System and Emergency Response Facilities.
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16 Additional requirements were imposed through revisions of
17 Regulatory Guide 1.97, "Instrumentation for Light-Water-Cooled Nuclear Power
18 Plants to Assess Plant and Environs Conditions During and Following an Accident"
19 (Revision 2, December 1980). Regulatory Guide 1.97 required that qualified
20 instrumentation be provided for monitoring numerous selected plant conditions
21 (i.e., pressure, temperature, radiation) and required the installation of accident
22 monitoring instrumentation that was supplied with Class 1E power,
23 environmentally and seismic qualified, and completely separate from those
24 instruments used under normal operating conditions.
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35 The following is a brief description of the major design changes
36 resulting from TMI-related requirements and their impact on the Limerick
37 Project.
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41 (a) Emergency Response Facilities. The incident at TMI led to
42 studies which identified the need for improvements in the response of operations
43 management to accidents at nuclear power plants including, in particular, the
44 upgrade and/or establishment of dedicated emergency response facilities.
45 NUREG-0737, NUREG-0696 and 10CFR50 Appendix E, as amended, specify the
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1 requirements for these emergency facilities.

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3 Numerous design upgrades and plant modifications were implemented
4 as a result of these requirements including installation of an operational support
5 center near the control room from which plant personnel can be assigned to
6 support emergency operations, and construction of a dedicated, fully-equipped
7 Technical Support Center (TSC) to further improve accident management. Due to
8 space limitations in the plant, establishing a TSC required construction of a new
9 facility. NRC requirements also specified that other permanent plant equipment
10 be located in the TSC building, such as the related Emergency Response Facility
11 Data System (ERFDS) and Radiation and Meteorological Monitoring System
12 (RMMS), as well as an inverter to power these systems.
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22 (b) Emergency Response Facility Data System (ERFDS). ERFDS is a
23 computer-based system which provides the Safety Parameter Display System
24 (SPDS) in the Control Room required by NUREG-0737, Supplement 1. Its function
25 is to collect, transmit and display all of the Regulatory Guide 1.97 parameters in
26 the Control Room, TSC and EOF per NUREG-0696. Additionally, it collects and
27 records transient data from process systems and piping system startup tests as
28 required by Regulatory Guide 1.68.
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36 The implementation of ERFDS required the installation of two
37 additional data acquisition computers in the TSC, two CRT's in the Control Room
38 and one CRT in both the TSC and the EOF, plus electrical equipment for gathering
39 data from over 700 locations in the plant. The system required approximately
40 3000 feet of raceway to run the approximately 90,000 feet of electrical and fiber
41 optic cables to transmit data from the data collection points to the computers and
42 CRT's. Fifty control room panel modifications involving a large number of wiring
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1 changes were required to connect to other systems.

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3 (c) Radiation and Meteorological Monitoring System (RMMS). The
4 RMMS is a computer-based dose assessment system which provides the capability
5 for near real-time estimates of atmospheric dispersion and offsite dose
6 consequences resulting from airborne radioactive releases from the station under
7 emergency conditions. The requirements for this system were imposed by
8 NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency
9 Response Plans and Preparedness in Support of Nuclear Power Plants," NUREG-
10 0737, and Regulatory Guide 1.97.
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18 The RMMS consists of a computer in the TSC which gathers data from
19 the station radiation monitoring system and meteorological monitoring equipment
20 installed on Weather Towers 1 and 2. Using this data, the computer plots travel
21 patterns of airborne radioactivity releases on the CRTs in the Control Room, TSC
22 and EOF and calculates resulting offsite doses. Implementation of this system
23 required approximately 38,000 feet of cable to be installed. This system was
24 turned over for startup testing in March 1984 and would not have supported an
25 earlier startup schedule because of the time required for development and testing
26 of the system.
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36 (d) Post-Accident Sampling System (PASS). Due to concerns
37 pertaining to the ability to obtain and analyze representative liquid and gaseous
38 samples following an accident, requirements for a post-accident sampling system
39 were set forth in NUREG-0737, Item II.B.3 and a number of subsequent NRC
40 clarifications.
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46 In response to these requirements and concerns PECO organized a
47 number of utilities operating BWR's to develop a generic, cost-effective approach
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1 to post-accident sampling. The generic design concept developed by the owners
2 group called for a sampling and analysis system that would provide all necessary
3 post-accident information while minimizing equipment complexity, total installed
4 cost, space and maintenance requirements. A "system level" design specification
5 was prepared and presented to the NRC Staff by General Electric and PECO to
6 obtain early Staff concurrence with the design approach. Following NRC Staff
7 acceptance, the PASS design was completed and a prototype was fabricated and
8 tested within a period of five months. Each utility participating in the owners'
9 group subsequently contracted with GE for equipment fabrication.
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18 The PASS system at Limerick consists of numerous sampling taps into
19 existing process pipelines in the Reactor Enclosure and routing of sample lines to
20 a collection station in the Control Enclosure. Installation of this system required
21 over 1400 feet of tubing and 700 feet of cable. The PASS system was completed
22 and turned over to the startup organization in March 1984.
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29 (e) Safety Relief Valve Position Indication. The position indication
30 for the Main Safety Relief Valves (MSRV) was another design change required
31 after the incident at TMI and was imposed in NUREG-0737. This design change
32 involved the installation of acoustical monitors downstream of the MSRV's to
33 detect flow and provide reliable indication of valve position. The acoustical
34 monitors are part of an instrument loop which transmits valve position to
35 indicators in the Control Room. This modification required installation of over
36 6000 feet of cable and approximately 500 feet of conduit.
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1 on plants then under construction. As a result, more rigorous requirements had to
2 be implemented at Limerick, especially in the areas of fire brigade training and
3 administrative controls, safe shutdown capability (i.e. fire protection of safe
4 shutdown components) and cable penetration seal qualification. Engineering for
5 these changes was not complete until mid-1984 while construction of additions and
6 modifications was not complete until September 1984.
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13 The following major changes were made at Limerick in the early
14 1980s in response to the new or revised NRC fire protection requirements.
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16 (a) Raceway Encapsulation. To meet the safe shutdown requirements
17 of Appendix R, over 1200 feet of raceway and over 1500 feet of conduit had to be
18 encapsulated with a fire barrier material. Also, because of the added weight of
19 the fire barrier, all the supports of the encapsulated raceway had to be re-
20 analyzed, which required a significant engineering effort. In some cases, the
21 supports had to be strengthened, thus requiring additional cost.
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29 Another impact of these installations was the effect on asbestos
30 worker availability. Raceway encapsulation was installed from November 1983 to
31 September 1984, during the same period when other major activities, such as pipe
32 insulation and penetration sealing, also required significant numbers of asbestos
33 workers. The demand for asbestos workers from these activities applied
34 tremendous pressure on the local union to supply manpower. The union was
35 required to recruit workers from other union locals, as well as supply temporary
36 work cards to non-asbestos workers. This necessitated increased supervisory and
37 manual labor costs and resulted in higher unit installation rates.
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47 (b) Sprinkler Additions. Additional sprinkler systems required at
48 Limerick included four water curtains and seven sprinkler systems. Each of these
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1 systems was necessary to comply with requirements to separate safe shutdown
2 area fire zones. The additional sprinkler systems were comprised of piping,
3 seismically qualified hangers, spray heads, control valves, detection and alarm
4 systems, conduit and wiring. The difficulties associated with the addition of these
5 sprinkler systems included: 1) all other commodities were previously installed
6 causing these systems to be fabricated at the site to avoid interferences; 2)
7 installation of the new systems required the erection of large scaffolding
8 structures, core drilling, and penetration sealing in conflict with the facility
9 turnover schedule, special coating activities, and clean-up effort; and 3)
10 functional testing of these systems had to be coordinated with the fire protection
11 startup testing schedule which was already compressed due to other design
12 changes and plant priorities.
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25 (c) Structural Steel Coating. Another requirement was the
26 determination that all structural steel forming or supporting safe shutdown fire
27 barriers must have protection equivalent to that required of the barrier (this is
28 generally interpreted as 3-hours). PECO initiated an extensive program to
29 identify those steel members that actually required fire protection. This included
30 a modeling and calculational program that was developed to reduce the amount of
31 protection modifications which had to be performed. This latter program, which
32 was the first of its kind to receive NRC approval, ultimately resulted in the
33 installation of additional sprinklers and fireproofing of a reduced number of steel
34 members.
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45 The steel members identified as requiring fire protection by the
46 modeling and calculational analysis had to be further evaluated to determine the
47 best method for providing fire protection. Coating of structural steel with a fire-
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1 proofing material was the most widely used method, and required in many
2 instances a labor-intensive method of application, namely hand-troweling.
3 Troweling the fire-proofing material onto the steel was required due to the
4 congested environment that existed this late in the construction schedule. The
5 coating effort also involved the erection of large scaffolding structures to gain
6 access to the overhead steel requiring coating. The use of scaffold was in conflict
7 with the facility turnover schedule and associated clean-up effort, and thus had a
8 delaying effect on these programs.
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17 Additionally, three sprinkler systems were added to protect structural
18 steel in those areas where coating was determined to be impractical. These
19 additions required the installation of sprinkler piping, new detection systems,
20 spray heads, control valves, remote control panels, alarm systems and related
21 conduit and wire for each fire zone. The installation of conduit and pipe also
22 required core boring walls and sealing the penetrations once the commodities were
23 installed. The difficulties associated with the addition of these sprinkler systems
24 included installation problems due to area congestion and tight clearances, and
25 correct spray head placement. The installations and functional testing of these
26 systems occurred during the startup phase of the project, and required additional
27 coordination and integration with the overall startup program.
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39 (d) Penetration Sealing Program. Much of this program was the
40 result of fire protection requirements. All penetrations through barriers
41 separating the various fire zones had to be sealed. Internal conduit in fire barriers
42 required a 3-hour rated fire seal rather than the smoke and hot gas seal originally
43 planned. As a result, approximately 8,000 seals had to be upgraded. Additionally,
44 certain safe shutdown areas had to be reviewed for the potential of flooding and
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1 their seals upgraded for water integrity. This program required that pipe
2 movement evaluations be performed which caused the costly and time consuming
3 addition of link seals and boots to some piping and sleeves. Difficulty was
4 encountered in the installation of seal materials due to the close proximity of pipe
5 supports to the penetrations. The design of the penetration seals was further
6 complicated by ALARA, HELB, and MELB design requirements.
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13 (e) Halon Fire Suppression System. The auxiliary equipment room
14 contains pre-fabricated raised floor sections with mounted relay panels (i.e. floor
15 modules), termination cabinets at the north and south ends of the floor modules,
16 and a site-fabricated raised floor to the north, south and west of the termination
17 cabinets with additional floor modules installed on the west side area. Since GE
18 had conducted tests which showed that a fire in the floor modules would self-
19 extinguish due to oxygen starvation, the original project design called for only
20 Class B heat and smoke detectors in the floor modules. However, in 1978, the
21 NRC required that a Halon fire suppression system also be installed in their
22 evaluation of NEDO-10466, Rev. 2, "Power Generation Control Complex Design
23 Criteria and Safety Evaluation." As a result of fire protection requirements for
24 safe shutdown capability, the remote shutdown panels had to be separated from
25 the remainder of the auxiliary equipment room by 3-hour rated fire walls. This
26 necessitated a redesign of both the fire detection and Halon systems to create a
27 separate zone for the new room.
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43 Further, during the late 1970s, GE and the NRC continued
44 development of a general licensing document for the auxiliary equipment room
45 floor module and termination cabinet fire detection systems. The final document,
46 NEDO-10466A, required a Class A detection system in the floor modules and
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1 termination cabinets. The NRC required Limerick to upgrade its system to the
2 final document. GE issued the design for the addition of smoke detectors to each
3 termination cabinet and to upgrade the detection system in November 1983. This
4 and the above described additional work required modification of the systems
5 which had previously been installed and required partial removal of the floor
6 module walking surface, thus disrupting various preoperational tests in progress at
7 the relay panels and restricting access of startup testing personnel. The combined
8 effect of these changes was to delay Halon system preoperational testing until
9 late summer 1984.
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19 3. Control Room Panel Modifications

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22 The control room and auxiliary equipment room contain numerous
23 control panels which provide information on the status of plant systems and
24 permit operators to manually control those systems. The control room is the
25 nerve center of the plant, both during operations and startup testing, with the
26 auxiliary equipment room containing the control logic for all plant systems.
27 Beginning in late 1978, the NRC Staff issued a number of publications which
28 required modifications to either the information displays or the control
29 instruments on these panels. The number of requirements increased substantially
30 following the TMI-2 incident. Major regulatory changes requiring panel
31 modifications include: 1) Regulatory Guide 1.75, "Physical Independence of
32 Electric Systems", Rev. 2, issued in September 1978; 2) ATWS requirements
33 described later; 3) the human factors review of control rooms required by
34 NUREG-0737; 4) Regulatory Guide 1.97, "Instrumentation for Light-Water-Cooled
35 Nuclear Power Plants to Assess Plant and Environs Conditions During and
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1 Following an Accident", Rev. 2, issued in December 1980; 5) NUREG-0696,
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3 "Functional Criteria for Emergency Response Facilities", issued July 1980; and 6)
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5 Supplement 1 to NUREG-0737 issued December 1982. The required modifications
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7 included the addition of new switches, indicators, lights, relays and associated
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9 wiring, and the physical separation of wiring and components of different
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11 electrical divisions.
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13 Due to the timing of these new requirements evaluation and design of
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15 the necessary changes continued through mid-1983, with installation at the site
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17 continuing through April 1984 as shown on Schedule 2. Installation of these
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19 modifications significantly disrupted the construction sequence and delayed
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21 startup testing. Indeed, in a number of instances, modifications had to be made to
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23 previously tested panels, thus requiring retesting and greater administrative
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25 control of the modifications.
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28 4. Mark II Modifications 29 30

31 With the identification of previously undefined Mark II hydrodynamic
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33 loads in 1975, an extensive industry-wide effort was initiated to resolve concerns
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35 raised over this issue. PECO took a lead role in this effort through the use of
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37 consultants and participation in industry groups. Due to the complexity of the
38
39 problem, the engineering design process required approximately seven years
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41 before final load criteria became available. These final criteria were the most
42
43 precise and least conservative design criteria which would resolve the Mark II
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45 concerns.
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47 During the engineering design process, a number of publications were
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49 issued by the NRC which reflected the evolutionary process of the Mark II
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1 problem resolution. In October 1978, bounding load design criteria for LOCA
2 related loads was issued in NUREG-0487, "Mark II Containment Lead Plant
3 Program - Load Evaluation and Acceptance Criteria, Generic Technical Activity
4 A-8". These criteria were revised and finalized through a supplement to NUREG-
5 0487 in August 1980. Long-term program criteria related to LOCA loads were
6 published in August 1981 in NUREG-0808, "Mark II Containment Program Load
7 Evaluation and Acceptance Criteria (A-8)", in November 1981 in NUREG-0783,
8 "Suppression Pool Temperature Limits for BWR Containments (A-39)", and in
9 October 1982 in NUREG-0802, "Safety Relief Valve Quencher Loads: Evaluation
10 for BWR Mark II and III Containments (A-39)". Mark II modifications added
11 approximately 750 new hangers and over 1400 modifications to existing hangers.
12 The construction effort was increased due to requirements for additional
13 scaffolding, remobilization of crafts, additional manual manhours required for the
14 new and revised hangers, and increased non-manual manhours required for
15 additional layout, work packages, and inspections. In the suppression pool,
16 structural modifications were required for the downcomer bracing system to
17 accommodate the Mark II loads.
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34 35 36 5. Equipment Qualification 37

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39 Equipment qualification refers to the process of demonstrating, either
40 through testing or by analysis, that equipment will operate satisfactorily in the
41 plant environment to which it may be exposed after a design basis earthquake or
42 postulated accident such as a loss of coolant accident. The primary licensing
43 requirements for equipment qualification in nuclear facilities are contained in
44 General Design Criterion (GDC) 4 of Appendix A to 10 CFR Part 50, adopted in
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1 1971. For many years, utilizing equipment of the highest industrial quality
2 analyzed for anticipated service conditions was considered to satisfy GDC 4.
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4 Since the mid-1970s, however, licensing requirements for equipment qualification
5 have changed and expanded considerably to require more vigorous analysis and/or
6 testing of all safety-related equipment. PECO was actively involved with the
7 generation of the industry qualification standards in the late 1960s and 1970s, and
8 recognized the need to impose qualification requirements on Limerick purchase
9 orders early in the project.
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17 In 1977, NRC research program test results cast doubt on the validity
18 of the methods being relied upon by the nuclear industry to establish the
19 environmental qualification of electrical equipment. In response to this discovery,
20 the NRC Staff began to develop extensive, detailed requirements in the area of
21 equipment qualification. This resulted in the issuance of NUREG-0588, "Interim
22 Staff Position on Environmental Qualification of Safety-Related Electrical
23 Equipment", in late 1979. On May 23, 1980, the NRC issued a Memorandum and
24 Order which expressed dissatisfaction with the industry's efforts in the
25 environmental qualification area, and ordered its Staff to use NUREG-0588 in
26 licensing reviews of plants. The Commission also at this time initiated a
27 rulemaking on environmental qualification of safety-grade electrical equipment.
28 This rulemaking eventually resulted in the issuance of 10CFR50.49 in January
29 1983 and the revision of Regulatory Guide 1.89, "Environmental Qualification of
30 Certain Electrical Equipment Important to Safety for Nuclear Power Plants" (Rev.
31 1) in June 1984. In a parallel effort, the NRC also issued Regulatory Guide 1.100,
32 "Seismic Qualification of Electric Equipment for Nuclear Power Plants," Rev. 1,
33 in August 1977, which provided revised criteria for the determination of
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1 acceptable seismic qualifications.

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3 The overall trend of these changing NRC requirements has been to
4 require equipment qualification by testing rather than by analysis wherever
5 possible, to require more conservative definitions of possible post-accident
6 environmental conditions, to exactly prescribe testing sequences and
7 methodologies to be used, and to insist on extremely detailed and thorough record-
8 keeping.
9

10 PECO instituted a program to review all existing environmental
11 qualification documentation and identified all deficiencies against the new
12 criteria. When deficiencies were found, programs for their correction and
13 resolution were formulated and carried out. PECO also participated in an industry
14 effort, headed by the Electric Power Research Institute (EPRI), to develop a data
15 base of equipment that had been qualified by various utilities and testing
16 companies. Using this information, PECO could determine whether a specific
17 piece of equipment had previously been qualified by others, thereby minimizing
18 the cost and time needed to qualify the particular piece of equipment. As a result
19 of the evolving regulatory requirements, the number of items to be qualified, and
20 the evolving state-of-the-art, engineering for equipment qualification
21 requirements was not completed until September 1983 as shown on Schedule 2.
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39 The major field impact of environmental qualification requirements
40 was equipment replacements and modifications. Environmentally qualified
41 replacements included over 75 instruments associated with various valves, heaters
42 and panels for standby gas treatment filters, diaphragm replacements on numerous
43 valves, and various HPCI and RCIC electrical components. The dynamic
44 qualification modifications associated with Regulatory Guide 1.100 included the
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1 addition of structural bracing on HVAC systems serving areas containing safety-
2 related equipment, filter units, and equipment in the standby gas treatment
3 system, control room emergency fresh air intake, reactor building recirculation
4 filters, drywell coolers, reactor building fan cabinets and in-duct radiation
5 monitors. Modifications were also required to stiffen and brace individual pieces
6 of equipment such as the HPCI and RCIC turbines, suppression pool suction
7 strainers, spent fuel pool gates, air accumulator tanks, instrumentation support
8 racks, electrical motor control centers, etc. Also, in the case of the primary
9 containment vacuum relief valves and MSRV discharge line vacuum relief valves,
10 internal parts had to be replaced with new parts.
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21 In addition to the cost impact of these modifications and
22 replacements, the changes were required during the system turnover period when
23 administrative controls made work more difficult. For example, because testing
24 was underway, detailed reviews for safety blocks and equipment tagging were
25 necessary to ensure the safety of the installation crews. Stringent cleanliness
26 precautions were also instituted, and tighter controls over modifications and
27 replacements were employed to ensure that appropriate retesting was performed
28 and previous testing was not invalidated. These safety and quality restrictions led
29 to added non-manual manhours in addition to the added manual manhours (i.e.
30 increased unit rates) because labor effectiveness was lower due to plant
31 congestion.
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44 6. Anticipated Transients Without Scram (ATWS)

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46 An ATWS occurs when the control rods, i.e., rods which absorb the
47 neutrons which produce the nuclear chain reaction and are used to terminate that
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1 reaction, fail to insert into the reactor. In 1978, after a lengthy evaluation, the
2 NRC Staff issued NUREG-0460, Volumes I, II and III. This publication outlined
3 alternative hardware systems and operating procedures which could be employed
4 to prevent or mitigate the consequences of an ATWS. At this time, however, the
5 NRC Staff did not select a particular alternative as its preferred approach.
6 Rather, the debate over the proper equipment systems and/or procedures to be
7 employed to resolve the ATWS concern continued through the first quarter of 1980
8 when the NRC Staff issued NUREG-0460, Volume IV. In that publication, the
9 Staff adopted a series of both hardware changes and operating procedures as its
10 preferred approach in resolving ATWS. The NRC ultimately confirmed the
11 requirements applicable to Limerick in a final, generic rulemaking on ATWS in
12 June 1984.
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25 Throughout the period of its evaluation by the NRC, PECO remained
26 informed of the nature of the ATWS concern and of the alternative solutions being
27 proposed to mitigate that concern. In March 1980, PECO initiated the design
28 effort to resolve ATWS concerns at Limerick. This program involved monthly
29 multi-discipline design and schedule control meetings with both GE and Bechtel.
30 Detailed design was performed by GE and Bechtel, with the participation of PECO
31 engineers. All related activities remained under direct PECO control. By late
32 1981, the conceptual design of the needed systems was complete and by early
33 1983, as shown in Schedule 2, all detailed design drawings were finished. The
34 system fully complied with the requirements imposed by the NRC in NUREG-
35 0460, Volume IV.
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47 The system developed for Limerick to respond to the NRC's ATWS
48 concern is called the Redundant Reactivity Control System (RRCS). The RRCS
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1 includes instrumentation which monitors reactor vessel pressure and water level,
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3 neutron flux and other parameters. This data is fed to microprocessors located in
4
5 the auxiliary equipment room. If the instrumentation shows that a situation exists
6
7 where the reactor should be shutdown, but the neutron flux is still high, the RRCS
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9 logic will cause the control rods to be inserted. At the same time, a timer is
10
11 started which will automatically initiate the Standby Liquid Control System which
12
13 injects boron into the reactor if the control rods have not been inserted. This
14
15 system also initiates a reduction of feedwater flow, isolates Reactor Water
16
17 Cleanup and trips the Recirculation Pumps.

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19 Construction of this system required the installation of over 35,000
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21 feet of cable and approximately 5000 feet of conduit as well as numerous control
22
23 panel modifications to connect the RRCS to other systems. Two additional sets of
24
25 4 KV switchgear were also installed in the Reactor Enclosure and a third pump and
26
27 associated piping were added to increase the capacity and reliability of the
28
29 Standby Liquid Control System. The necessity to make the control panel
30
31 modifications, in particular, delayed turnover for startup testing of the reactor
32
33 water cleanup and the standby liquid control systems. This out-of-sequence
34
35 installation activity disrupted and increased the cost of startup testing while also
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37 adversely affecting the unit rates for cable and conduit installation.

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39 Installation of the RRCS, as shown in Schedule 2, was completed in
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41 April 1984, and, given the timing of the imposed NRC requirements and equipment
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43 delivery times, could not have been completed to support a significantly earlier
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45 fuel load date than that actually achieved.
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1 quantity of reinforcing steel in Seismic Category I structures was approximately
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3 350 pounds per cubic yard versus 250 pounds per cubic yard budgeted in the
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5 original project cost estimate (a 38% increase). This reinforcing resulted in
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7 increased complexity of reinforcing steel erection and cadweld splicing, form tie
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9 installation, embedment placement, preplacement cleanup, and concrete
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11 placement, all of which adversely affected unit rates.
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13 In addition, Regulatory Guide 1.29, adopted in June 1972, was revised
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15 three times as new requirements were issued with the last revision occurring in
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17 September 1978. It required that all non-safety-related equipment and
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19 commodities whose failure could affect safety-related equipment be installed to
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21 seismic standards. Seismic installations require not only additional supports but
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23 also larger, stiffer and more complicated supports than normal non-seismic
24
25 installations. In general, seismic supports are items fabricated from structural
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27 steel shapes (i.e. structural tubing, wide flange, angles, plate and bar stock) which
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29 require extensive cutting, fitting and welding in the field. Non-seismic pipe
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31 hangers are usually assembled by threading and bolting standard hanger
32
33 components purchased from a vendor. Seismic supports for large pipe required 2.6
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35 times more labor hours than for non-seismic supports, while seismic small pipe
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37 installations required 2.7 times more labor hours than non-seismic installations,
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39 adversely affecting both total labor manhours and unit rates. Unit rates for other
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41 commodities (i.e. light fixtures, conduit, etc.) were similarly impacted.
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43 Regulatory Guide 1.29 also imposed additional Quality Assurance
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45 requirements which increased Field Engineering and Quality Control inspections.
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47 As a result of these requirements, increased costs were experienced in identifying
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49 the increased scope, maintaining the scope as the design was evolving, preparation
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1 of an inspection program, inspections, maintenance and collation of the inspection
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3 date.
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6 8. High Energy Line Break (HELB)/Moderate Energy Line Break
7 (MELB).
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10 HELB's and MELB's are postulated accidents used in the design and
11 safety reviews of nuclear power plants. The piping in a nuclear power plant is
12 classified as high or moderate energy piping, based on the temperature and
13 pressure of the fluid contained in the piping. A failure of high energy piping would
14 result in the release of high temperature or pressure water or steam, and
15 depending on the way the piping is assumed to fail, might also possibly result in
16 violent motion of the pipe (i.e., pipe whip) and the generation of missiles. In
17 reality the probability of a break occurring in nuclear power plant piping is quite
18 small because of the conservative design practices, the high quality of fabrication
19 and materials used, and the frequent inspection of such piping carried out during
20 the plant's operating life.
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32 General Design Criterion 4 in Appendix A to 10 CFR 50, adopted in
33 1971, provided the initial design requirements for the protection against the
34 effects of HELB's and MELB's. In November 1975, the NRC issued Standard
35 Review Plan (SRP) Sections 3.6.1, "Plant Design for Protection Against Postulated
36 Piping Failures in Fluid Systems Outside Containment," and 3.6.2, "Determination
37 of Break Locations and Dynamic Effects Associated with the Postulated Rupture
38 of Piping" to provide a basis for HELB/MELB design.
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46 Following a postulated pipe break, a high energy line is predicted to
47 whip about violently like a fire hose due to the force of the escaping fluid. Pipe
48 whip restraints are large structural steel components that limit the movement of
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1 the pipe and protect safe shutdown components. The design effort for such pipe
2 whip restraints is significant, involving calculations of whip force, structural
3 loads, and evaluation of as-built configurations. Construction of the restraints
4 requires significant effort since the restraints must be large to withstand the
5 predicted loads. Additionally, since the piping cannot be held rigidly due to
6 normal expansion and contraction during operation, the gaps between the piping
7 and the restraints must be small to reduce the whip forces to manageable levels.
8 A high degree of accuracy and thus additional time (i.e. increased unit rates) are
9 required for installation.
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19 Jet impingement loads are also predicted to occur as a result of the
20 high velocity fluid escaping from the HELB. Protection against jet impingement
21 is provided by specific shields designed to withstand the jet force or by locating
22 vulnerable components away from the postulated water or steam jets.
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27 These HELB/MELB requirements resulted in the addition of 400 tons
28 of pipe whip restraint throughout the primary containment building, reactor
29 building and turbine building. This required additional embeds in concrete walls,
30 heavier building steel and modifications to previously installed steel to
31 accommodate the loads on the restraints. This program also required steel plate
32 shims and energy absorbing components to be installed between the pipes and the
33 restraints to provide the proper spacing to absorb the pipe whip loads for the
34 postulated break. The shimming process required extensive measurements and
35 templating of the affected areas, machining of the steel shims and installation of
36 the shims to rigorous tolerances. These latter steps were new and extensive and
37 added considerable manual and non-manual manhours to the project.
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49 HELB/MELB considerations also necessitated the inclusion of steam
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1 release paths to the atmosphere to prevent compartment overpressurization in the
2 event of a break. This required additional concrete walls, penetration seals and
3 blowout panels.
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8 9. As-Built Piping Reconciliation - I&E Bulletin 79-14.
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11 In 1979, the NRC Staff identified a number of operating plants with
12 installations of piping and supports which did not agree with design drawings. The
13 NRC Office of Inspection and Enforcement issued I&E Bulletin 79-14 "Seismic
14 Analysis For As-Built Safety-Related Piping Systems" on July 18, 1979. This
15 Bulletin required that licensees inspect their facilities to ensure that the actual
16 piping system configurations conformed to design drawings. Plans for an "as-
17 built" reconciliation program were in existence at Limerick at the time, but had
18 to be substantially modified and strengthened to comply with I&E Bulletin 79-14.
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27 The initial project plans included inspections by field engineers,
28 inspection and acceptance by quality control personnel, and a final walkdown by
29 the stress engineers who designed the piping systems. The final program, which
30 reflected the requirements of I&E Bulletin 79-14, was far more extensive,
31 including the inspection of individual hanger components by field engineers and
32 quality control engineers, and the assembly of installation drawings which
33 corresponded to an engineering calculation. Designers then performed additional
34 stress analyses for the as-installed configuration and issued Stress Reconciliation
35 Notices (SRN) to the field including revised installation drawings incorporating the
36 field changes on which the stress reanalysis was based. Final field verification
37 was required before the SRN was completed. The as-built process was required
38 prior to hydrostatic testing and resulted in delays in system turnovers to startup.
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1 These efforts also resulted in significant increases in required engineering and
2 non-manual manhours.
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6 10. Security Requirements.
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9 The security system originally designed for Limerick consisted of
10 fencing around the site and standard access controls. However, in February 1977,
11 the NRC issued 10 CFR 73.55, "Requirement for Physical Protection of Licensed
12 Activities in Nuclear Power Reactors Against Radiological Sabotage", which
13 substantially increased the security requirements at nuclear power plants.
14 Engineering for these security changes was completed in early 1983 and the final
15 system was completely installed by mid-1984.
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23 The security system at Limerick consists of approximately 50
24 microwave zones, 50 closed circuit TV (CCTV) cameras, 250 door monitors with
25 the majority being controlled, and numerous barriers monitored with breakwires
26 and shaker sensors. The monitoring and control information is fed through seven
27 multiplexers to a redundant computer system located in the Secondary Alarm
28 Station (SAS). The system is monitored in the Central Alarm Station (CAS) and in
29 the SAS. The guard force in the CAS and SAS also monitor the TV cameras. A
30 total of approximately 56,000 feet of embedded conduit, 20,000 feet of exposed
31 conduit, 1300 feet of wireway, 150 feet of cable tray, and 350,000 feet of cable
32 were required to connect the monitoring and control elements to the computers.
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43 Two guard stations were also required in the Technical Support
44 Center and Administration Building for personnel access. The guard stations
45 include explosive and metal detectors, X-ray machines, and bullet-proof glass-
46 enclosed badging facilities. A double fence around the plant boundary as well as
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1 numerous interim barriers were required to prevent unauthorized access to the
2 plant.
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5 11. NRC I&E Bulletin No. 80-11 (Masonry Walls).
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8 Concrete masonry walls are constructed using precast concrete blocks
9 which are mortared together to form an integral structural unit. They use hollow
10 or solid blocks and may be designed and constructed as reinforced walls, wherein
11 steel reinforcing bars are used. Masonry walls are used extensively in nuclear
12 power plants where offices, laboratories, washrooms, kitchen facilities, etc., are
13 provided and also in safety-related structures. Concrete masonry walls are used
14 in Category I structures only where the strength of reinforced concrete is not
15 required (i.e., interior walls for radiation shielding, fire protection or ventilation
16 boundary requirements for partitions, etc.). Safety-related conduit, junction
17 boxes, instrumentation sensing lines, etc. may be attached to these walls and
18 safety-related equipment, piping, cable trays, ventilation ducts, etc. may be
19 installed near them.
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32 In May 1980, the NRC Office of Inspection and Enforcement issued
33 I&E Bulletin 80-11 which identified NRC concerns with the structural integrity of
34 concrete masonry walls with Seismic Category I piping attached to them. I&E
35 Bulletin 80-11 required utilities to identify all masonry walls in their facilities
36 where failure might affect safety-related systems, re-evaluate the design and
37 construction practices employed in building such walls, justify the acceptance
38 criteria used in the re-evaluation, and perform a confirmatory masonry wall test
39 program, if necessary, to justify the re-evaluation acceptance criteria. In July
40 1981, the NRC Staff published a Branch Technical Position, "SEB Interim Criteria
41 for Safety-Related Masonry Wall Evaluation", Revision 1, which required that all
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1 previously constructed unreinforced masonry walls be re-evaluated to determine
2 the need for reinforcement modifications and that all new walls be built using
3 reinforced concrete or reinforced concrete masonry.
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6 Pursuant to I&E Bulletin 80-11, engineering identified approximately
7 130 concrete-masonry walls at Limerick requiring reevaluation. As-built drawings
8 were used to confirm safety and non-safety related attachments on the walls. The
9 concrete walls were placed into groups based on similar characteristics and one
10 wall representative of each group was analyzed. Results of these analyses
11 indicated that only one wall required modification.
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19 In addition to these reanalyses, it was necessary to develop a program
20 which would ensure that future attachment of safety and non-safety related items
21 would meet the requirements set forth in the Bulletin. This program was
22 continued through project completion and became a restraint on installation of
23 field-run commodities in late 1980 and 1981, adding substantially more time and
24 non-manual manhours than had been anticipated for field installed commodities
25 routed on masonry walls.
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34 12. ASME Section III Requirements

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37 The NRC's regulations in 10CFR50.55a, issued in June 1971 require
38 the use of ASME Section III criteria for the design and analysis of piping and pipe
39 supports in nuclear plants. Under Section III, a "Design by Analysis" approach is
40 imposed under which every detail of the piping system design must be supported
41 by documented calculations. This approach requires much more rigorous testing
42 and documentation to prove compliance with the Code than was used for the
43 design of piping and pipe supports in earlier vintage nuclear power plants.
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1 Field installation, examination, and testing requirements for ASME
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3 Section III are also more restrictive. Much reduced installation tolerances are
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5 utilized and additional piping must be examined with techniques such as
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7 radiography, liquid penetrant and magnetic particle testing. These techniques
8
9 require that the surface condition of the finished weld be smoothed to eliminate
10
11 the potential masking of subsurface defects. Additionally, Section III piping is
12
13 subject to baseline and periodic inservice inspection per Section XI. In order to
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15 perform the required ultrasonic examinations, weld surfaces had to be ground to
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17 an almost mirror-like finish, a process which is highly manhour intensive.
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20 C. Conclusions
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23 Based on the preceding information in Section III, it is concluded that:
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26 • There were a large number of new regulatory requirements
27 late in the project which resulted in significant increases in
28 commodities, manual and non-manual manhours, and unit
29 installation rates.
30
- 31 • The late imposition of these regulatory changes necessitated
32 the adoption of a "fast track" approach for the implementation
33 of the required changes into the already congested plant. This
34 approach necessitated that installation occur as the design was
35 being finalized.
36
- 37 • These late changes had a significant adverse impact on system
38 completion and preoperational testing activities.
39
- 40 • The substantial level of intervention in the Limerick licensing
41 process and the resultant intensity of the NRC review
42 necessitated the resolution of essentially all of these
43 regulatory items prior to issuance of the low power license.
44
- 45 • Two particular NRC-mandated design changes (ATWS and
46 RMMS) could not have been completed to support an earlier
47 fuel load date because of the time required for design,
48 procurement and installation of the necessary equipment.
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ORIGINAL

PECO EXHIBIT NO. 3

PHILADELPHIA ELECTRIC COMPANY - ELECTRIC OPERATIONS

RECEIVED

STATEMENT OF REASONS

SEP 27 1985

Philadelphia Electric Company ("PECO" or "Company") is filing herewith Supplement No. 15 to its Tariff Electric - Pa. P.U.C. No. 26, to become effective November 27, 1985. As explained below, Supplement No. 15 is designed to produce an increase in the Company's annual electric revenue of approximately \$670.7 million, or 28.2% of test year revenue, based on budgeted sales for a future test year ending June 30, 1986.

SECRETARY'S OFFICE
Public Utility Commission

The principal reason for this rate filing is to reflect the increased capital and operating costs, and decreased energy production costs associated with the Limerick Nuclear Generating Station Unit 1 and 100% of Common Plant. The \$670.7 million requested increase reflects \$878.2 million in higher costs of service offset by the Company's \$207.5 million estimate of the average annual energy cost savings anticipated from the operation of Limerick 1 during the first two years rates established in this proceeding will be in effect. This energy cost reduction is reflected in this filing through a 7.505 mills/kwh reduction in the cost of fuel included in base

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rates. This "roll-out", however, will not alter the normal operation of the Company's Energy Cost Rate.

Limerick 1 is expected to begin commercial operation in the first quarter of 1986. At that time, the Company will cease AFUDC accruals on its investment in this unit and will begin to incur depreciation and operating and maintenance expenses for Limerick 1. As a result, the Company's earnings would be reduced by approximately \$361 million a year without rate relief. This is approximately 88% of the Company's actual achieved earnings for the 12 months ended December 31, 1984. To avoid this financial exposure while this rate proceeding is pending, the Commission approved a Declaratory Order on September 28, 1984 at Docket No. P-840514, which permits deferral of capital and operating costs, and energy cost savings associated with Limerick 1 until the unit is reflected in rates.

The Company has taken several steps to ameliorate the impact of the proposed increase on customers and the economy in the Company's service territory. The rate increase is based upon a 15.75% rate of return on common equity, which is significantly less than the 16.75% return granted by the Commission in the Company's last rate proceeding at Docket No. R-842590, and substantially less

than the Company's current cost to attract common equity capital. The Company also has reduced its current revenue requirement by extending the lives of its Eddystone and Cromby coal-fired generating units, thereby substantially reducing depreciation expense.

In addition, the Company is proposing to "phase-in" the requested 28.2% increase over a three-year period. Each step of the increase will be 9.4% or approximately \$224 million so that the total increase of 28.2% or \$670.7 million will not be billed until the beginning of the third year after the increase is granted, i.e., June 1988. The amount of revenue unrecovered during the first two years will be collected over a three-year period beginning with the fourth year after the increase is granted (i.e., June 1989). The Company is not seeking to recover any carrying charges associated with this unrecovered revenue.

Implementation of the phase-in proposal depends in part upon the amount of the final increase granted by the Commission and is fully explained in the testimony of Raymond C. Williams (Statement 17). Accounting issues arising out of the phase-in proposal are addressed in the testimony of David J. Farling (Statement 16), who is a Certified Public Accountant, Partner and Chairman of the Electric and Gas Utilities Industry Specialization Program in the public accounting firm of Coopers and Lybrand.

Finally, the Company intends not to file a further electric base rate increase which would be effective, after full investigation and suspension by the Commission under 66 Pa.C.S. §1308(d) before June 1988, unless, in the Company's judgment, failure to do so would jeopardize the Company's financial viability. This "stay-out" proposal is set forth in the testimony of Joseph F. Paquette, Jr. (Statement 3).

Reasons for Requesting the Increase

The Supplement No. 15 proposed rate increase is necessary to permit recovery of the capital and operating costs associated with Limerick 1, offset by energy production cost savings realized through operation of that unit. On a more detailed basis, the increase includes approximately \$742 million associated with Limerick 1 and Common Plant net of anticipated energy savings, approximately \$30.5 million associated with the net effect of other rate base additions, and approximately \$9.5 million associated with increased wages and benefits and other operating and maintenance expenses. These increases are offset by a \$24.9 million decrease in the net cost of capital associated with the Company's reduction of its common equity claim, a \$75.3 million reduction from life extension of coal-fired generating units and increased sales of electricity, and \$11.1 million in revenue from

anticipated growth in sales above budgeted future test year levels. See Appendix A to this Statement.

The Company's present rates were established by Commission Order entered January 25, 1985, based upon investment and operating cost data for the 12 months ended December 31, 1984. In that Order, the Commission found that the Company should be permitted a fair opportunity to achieve a return upon its investment capital of 13.27%. As shown in Exhibit TPH-2, p. A-1, the Company's existing rates will produce a return upon investment of only approximately 6.39% for the annualized future test year period ending June 30, 1986. This rate application seeks to adjust rate levels to permit the Company an opportunity to earn a fair return of 12.7% upon its investment to provide service to the public.

Financial and Accounting Data

In support of Supplement No. 15, the Company is filing financial and accounting data depicting the results of its operations during an historic test year ended June 30, 1985 (Exhibit TPH-1), and as projected for a future test year ending June 30, 1986 (Exhibit TPH-2). The Company is also providing in three volumes the data requested by the Commission in its Tariff Regulations, and the Statements and Exhibits which it will introduce into the record as its direct case in this proceeding.

The Company's rate base claim of \$6.96 billion has been developed on a basis generally consistent with past rate filings. Plant levels for the test year ending June 30, 1986 have been developed from the Company's plant accounts and 1985 and 1986 Budgets as explained by Albert J. Solecki (Statement 19) and Warren H. Smith (Statement 25). Mr. Smith is Manager of the Company's Plant Accounting Division.

The major plant addition since the Company's last proceeding is Limerick Unit 1. A detailed summary of the evidence presented by the Company in support of rate base inclusion of this unit is set forth below. The Company's claim includes 100% of Limerick "common plant". This claim recognizes that: (1) the use of common plant at Limerick was a prudent and reasonable decision designed to produce substantial cost savings to ratepayers as compared to the construction of totally separate units; (2) the construction and completion of common plant was required either for the actual operation of Limerick 1 or for the efficient and cost effective completion of the plant; and (3) the inclusion of all common plant in rate base with Unit 1 will reduce the total cost of Limerick. Support for the Company's claim is set forth in the testimony of Vincent S. Boyer (Statement 1).

Also included in the Company's claimed measure of value are the standard additions for non-revenue producing

construction work in progress, land held for future use, non-fuel materials and supplies and cash working capital, as explained in the testimony of Richard W. Wright (Statement 20), and fuel inventories as explained in the testimony of John J. Carroll (Statement 22). The standard deductions for deferred taxes, customer deposits and customer advances are also included, as explained in the testimony of Thomas P. Hill, Jr. (Statement 18). In addition, the Company's rate base claim includes its \$82.25 million average investment in nuclear fuel assemblies in the reactor at Limerick 1. This investment is required to operate Limerick 1, is in accordance with prior Commission practice, and is explained in detail in Mr. Hill's testimony (Statement 18).

Accounting data for the future test year have been taken from the Company's 1985 and 1986 Budgets. Revenues have been adjusted to include growth in numbers and usage of customers, and to properly account for revenues collected under the Energy Cost Rate and State Tax Adjustment Clause. Appropriate adjustments also have been made to increase revenues from wholesale interstate customers to the level required to produce the rate of return claimed by the Company in this proceeding, and to reflect revenue lost from the termination of service to the Borough of Lansdale as of July 1985. These adjustments are explained in the testimony of Mr. Hill (Statement 18) and Mr. Wright (Statement 20).

Expenses have been adjusted to place them upon a normalized test year end basis to reflect the prospective nature of ratemaking. The adjustments include annualized operating and maintenance expenses associated with Limerick Unit 1; annualized wages and benefits to reflect a general wage increase granted by the Company on August 1, 1985; changes in Social Security tax expense and production plant operation and maintenance expense; a normalized level of outage expense for the Company's generating units; the retirement of Southwark 1 and 2, Richmond 9 and miscellaneous combustion turbines; the Company's share of costs associated with the Salem Management Evaluation Program amortized over two years; regulatory expenses incurred in connection with the Commission's investigation of Limerick 2 amortized over five years and with the Company's ECR No. 9 normalized over 2 years; the cost of engineering studies for the cancelled Heaton-Byberry transmission line project; and various other expense amortizations approved in prior Commission proceedings. These adjustments are set forth in Exhibit TPH-2 and are explained in the testimonies of John B. Cotton (Statement 26), Mr. Carroll (Statement 22), and Mr. Hill (Statement 18). Mr. Cotton is the Limerick Plant Staff Maintenance Engineer in the Company's Electric Production Department.

Claimed depreciation expense is based upon the book reserve remaining life method as approved by the Commission in the Company's last rate proceeding at Docket No. R-842590. Depreciation for Limerick 1 is based upon a 39-year life, which reflects the 40-year operating license for Limerick less one year for pre-commercial testing. Depreciation expense has been adjusted to reflect the life extensions of Eddystone 1 and 2 and Cromby 1, and the retirement of Southwark. Detailed support for the Company's depreciation claim is set forth in the testimony of Alfred Wroblewski (Statement 21) and Exhibits AW-1 to AW-3.

Claimed tax expense has been developed in accordance with procedures employed in prior Commission rate proceedings. No claim has been made to normalize state deferred taxes, and the Company has amortized additional Investment Tax Credit to reflect year-end plant in service in accordance with prior Commission Orders. Tax issues are addressed in the testimony of Guy A. Sileo (Statement 23).

Decommissioning and spent fuel claims are identical in concept to those approved in prior Company rate proceedings, and are explained by Mr. Wright (Statement 20) and Mr. Carroll (Statement 22). In addition, the Company's decommissioning claim is based upon a new study (Exhibit NBM-1) which provides for the first time a site specific

study of the cost of decommissioning the Company's nuclear units. This study is explained in the testimony of N. Barrie McLeod (Statement 27). Mr. McLeod supervised the preparation of the Company's decommissioning study while he was Vice-President of Major Projects at NUS Corporation, and currently holds the position of Vice-President of E. R. Johnson Associates, Inc., a consulting firm whose specialties include the determination of nuclear decommissioning and waste disposal costs.

The Company's claimed overall rate of return is 12.70%, which consists of a 10.84% embedded cost of long-term debt, 10.54% embedded cost of preferred stock, and an equity cost opportunity rate of 15.75%. The Company's claimed capital structure ratios are 50.7% long-term debt, 10.8% preferred stock, and 38.5% common equity, and are the ratios projected at June 30, 1986. Detailed support for this claim is set forth in the testimony of Joseph F. Brennan (Statement 28), and Exhibit JFB-1.

Limerick Project Management

A substantial addition to the Company's claimed measure of value is the \$3.82 billion of original cost for Limerick 1 and 100% of Common Plant. Recognizing the magnitude of this addition, the Company has submitted extensive evidence demonstrating that these costs were reasonably and prudently incurred.

Several comparisons have been made of Limerick cost and schedule duration with data for other nuclear facilities. A comparison of Limerick with other plants of similar design, i.e. Boiling Water Reactors, which were constructed during the same time period is presented in the testimony of James J. Clarey (Statement 4). In addition, broader comparisons with data for all nuclear facilities of the same vintage as Limerick adjusted to eliminate the effects of major differences between plants are contained in the testimony of Dr. Lewis J. Perl of National Economic Research Associates, Inc. (Statement 11) and Dr. William H. Hieronymus of Putnam, Hayes and Bartlett, Inc. (Statement 15). These analyses demonstrate that Limerick's cost and schedule are about average for the industry and, therefore, are indicative of reasonable and prudent management.

During the construction of Limerick, a number of significant and unforeseeable problems were encountered, including NRC-mandated design changes, cash constraints and labor shortages. The Company's only course of action was to respond to these problems as effectively as possible by actively participating in project management and implementing a comprehensive management system to control cost and schedule. These problems and the management organizations and controls established in each functional area of the project, i.e. engineering, procurement,

construction, startup, regulatory relations and quality assurance, are described by John S. Kemper (Statement 2). Mr. Kemper is Vice-President of the Company's Engineering and Research Department and is the senior Company official responsible for managing the Limerick project. Based on his detailed knowledge of the project and experience with power plant construction, Mr. Kemper concludes that the Company's management of Limerick was reasonable and prudent. This judgment is further confirmed by NRC assessments of the Company's management during the project, as explained by Mr. Kemper (Statement 2). Additional specific detail regarding the management of construction activities and the problems facing project management is presented by Mr. Clarey (Statement 4) and Charles K. Soppet (Statement 7). Mr. Clarey is the Company's Construction Manager at Limerick and Mr. Soppet is the Limerick Project Manager for Bechtel Power Corporation, the architect/engineer for the project.

An independent assessment of Limerick project management has been developed by Theodore Barry and Associates ("TB&A") and is presented in the joint testimony of James O. Love and Basil P. Kononetz (Statement 8). TB&A is a management consulting firm with extensive experience in the review and development of management systems for nuclear plant construction. It has been retained by the Commission to perform similar evaluations. Its assessment is based

upon a review of extensive documentation and interviews with numerous management personnel involved with Limerick, and encompasses all functional areas of project management and major decisions made during project development and construction. TB&A confirms the Company's view that the management organizations and control processes employed at Limerick were reasonable and prudent.

Joseph F. Paquette, Jr., Vice-President of the Company's Finance and Accounting Department (Statement 3), discusses the Company's financial management in support of the Limerick project. As he explains, the Company in 1974, 1976 and 1978 was faced with financial constraints which forced it to reduce capital outlays at the project. In addition, the Company's analyses at the time indicated that early completion would result in significant short-term costs to ratepayers. As the Company's load forecasts during this period indicated that Limerick was not needed on the accelerated schedule, Mr. Paquette explains that it would have been imprudent to have risked financial catastrophe and unnecessarily burdened ratepayers by rushing to completion of the project. Moreover, as Mr. Paquette explains, the Company could not have raised the capital to complete the project on the accelerated schedule in any event.

Vincent S. Boyer, Senior Vice-President, Nuclear Power (Statement 1), provides further data as respects management's response to these financial constraints. As he explains, the Company carefully managed and conserved its cash resources to obtain the earliest project completion consistent with the Company's financial capabilities. William A. Abrams, Vice-President of Duff & Phelps, Inc. (Statement 10) and who during this period evaluated the Company's financial condition in order to assign ratings to its securities, explains that failure to defer Limerick could have seriously impacted the Company's ability to raise the capital to complete the project. Further, Dr. Perl (Statement 11) confirms that the economic considerations known or knowable by the Company at the time of its 1976 and 1978 decisions to reduce Limerick construction expenditures did not suggest that such decisions would have a significant adverse effect upon ratepayers. Indeed, Dr. Perl finds that the data available in the 1976 to 1978 time period indicates that ratepayers would not be injured by project deferral. Finally, Theodore Barry & Associates (Statement 8) in their review of the entire construction effort confirms that the Company's financial management of the project, including the 1976 and 1978 expenditure decisions, was prudent.

An analysis of the reasons for Limerick cost growth has also been performed pursuant to the requirements of

Section 1308(f) of the Public Utility Code (66 Pa. C.S. §1308(f)). The analysis was formulated and conducted by TB&A and its results are described in the testimony of Messrs. Love, Kononetz (Statement 8) and Kemper (Statement 2), and in PECO Exhibit 2. Several major factors were identified as causing cost increases at Limerick, including regulatory-imposed design changes, cash constraints, design changes to enhance plant operability and reliability, and licensing delays. The analysis indicates that approximately 68%, or a substantial majority of the direct cost increase for Limerick, was the result of new or revised regulatory requirements or other externally imposed factors, i.e cash constraints, labor unavailability, etc. An additional 6% was identified as resulting from design changes to improve plant reliability and/or operability, while 10% was attributed to estimate omission/error, the indirect effects of regulation and other factors, and 16% resulted from the unanticipated effects of inflation. The cost effects attributed to regulatory factors have been independently confirmed by Dr. Roger J. Mattson of International Energy Associates, Ltd. (Statement 9), an engineering consultant who was a senior NRC official responsible for the licensing of numerous nuclear plants including Limerick. Dr. Mattson provides an extensive explanation of the NRC licensing process and the extent of, reasons for and effects of the many

and continuous changes in its plant design requirements in the late 1970s and early 1980s.

Additional explanations confirming the significant cost and schedule impact of major regulatory requirements are presented by Mr. Boyer (Statement 1), Mr. Clarey (Statement 4), Mr. Soppet (Statement 7), David R. Helwig (Statement 5), and Edward F. Sproat, III (Statement 6). These cost impacts are summarized by Mr. Kemper (Statement 2) and are detailed in PECO Exhibit 2. Both as shown in Exhibit 2 and as described by Mr. Boyer and Mr. Paquette, the combination of late design changes required by NRC regulation changes, uncontrollable licensing delays and cash constraints prevented Limerick's completion on a significantly advanced schedule.

Further, Mr. Boyer explains that completion of the Limerick project was the prudent alternative at every point in its construction (Statement 1). As he states, the Company continuously reexamined its initial decision to construct Limerick, and always found that the project was of benefit to ratepayers and should be completed. The Company's load forecasts during the construction period always demonstrated that the project was needed to meet future service needs, as explained by William C. Hoch, Jr., the Company's Marketing Department Manager (Statement 13).

Moreover, the Company's capacity planning analyses during this period showed that Limerick was always the most prudent generation alternative, as explained by Cary H. Rush (Statement 14). Mr. Rush is the Chief Engineer for the Research and Planning Division in the Company's Engineering and Research Department. Dr. Perl (Statement 11) and Louis M. Guth, a Senior Vice-President for National Economic Research Associates, Inc. (Statement 12), and Dr. Hieronymus (Statement 15) confirmed the correctness of these Company conclusions based upon their review of the available data during that period and the comparable judgments made by others at the time.

Finally, Dr. Hieronymus (Statement 15) describes the appropriate regulatory standards which have been generally employed in evaluating rate base inclusion of large beneficial investments such as the Limerick plant. In particular, Dr. Hieronymus focuses his discussion upon the relationship between the prudent investment and used and useful standards. As part of his presentation, and while noting that it is not relevant to application of either standard, Dr. Hieronymus demonstrates that Limerick will produce life-cycle benefits for ratepayers of between \$2 to \$4 billion depending upon certain projections not susceptible to precise determination. Finally, Mr. Rush (Statement 14) explains the Company's current and future capacity levels

and planning processes to assure economic and reliable service to ratepayers.

Proposed Rate Structure

The requested revenue increase has been distributed uniformly among customer classes based upon class revenue contributions including fuel costs except that those classes (OP, SLP and SLS) whose return was above 140% of the system average at present rates received a zero increase, and the Residential Heating class received an increase which maintained its 116% index of relative return to the class average. This allocation of the increase places all major classes of service within 25% of the system average return and moves all classes toward system average, except R and RH which remain constant. In proposing this revenue allocation, the Company has considered, and in its view, appropriately reflected cost of service principles and the need to avoid disruptive rate changes to any customer class. A detailed explanation of the proposed class revenue allocation is set forth in Mr. Williams' testimony (Statement 17).

The Company also has proposed several rate design changes. The Company proposes to implement more cost-based customer charges for Rates R, RH and GS, proposes several changes to the design of Rate GS to more closely reflect the

cost of serving customers within that class, and proposes revisions to the Suburban Street Lighting Rate to more accurately reflect the cost of providing service to different lamp sizes.

Finally, in accordance with the Commission's Order in the Company's last rate proceeding at Docket No. R-842590, the Company has conducted an extensive study to determine the cost of providing service to SEPTA and AMTRAK. The results of this study are presented in the Company's general class cost of service study (Exhibit WFS-1) and are explained in the testimony of William F. Sundermeir (Statement 24). Based upon the results of this study, the Company is proposing cost-based rates for SEPTA and AMTRAK as explained in Mr. Williams' testimony (Statement 17).

APPENDIX A

Limerick Rate Filing (a)
Components of the Rate Increase
(\$ Million)

		<u>Full</u>
Rate Increase Request for 12.70% Overall Return and 15.75% Return on Equity		\$670.7
Percent Increase in Base Revenues for 12 Months Ending 6/30/86		28.2%
<u>Return & Capitalization</u>		
Equity (16.75% to 15.75%)	(\$24.7)	
Debt & Preferred	(7.0)	
Capitalization	<u>6.8</u>	
Sub-Total		(\$24.9)
<u>Rate Base (Excluding Limerick)</u>		
Plant	\$52.2	
Reserve	(26.6)	
Accumulated Deferred Taxes	(7.0)	
Turbine Lease Cancellation	5.2	
Cash Working Capital	4.5	
Other	<u>2.2</u>	
Sub-Total		\$30.5
<u>O&M Expenses</u>		
Wages & Benefits	\$9.5	
Life Extension (Eddystone & Cromby)	(34.8)	
Increased Sales Net of Increased O&M	<u>(40.5)</u>	
Sub-Total		(\$65.8)
<u>Limerick</u>		
Carrying charges Limerick #1 & 100% Common	\$848.7	
O&M Expenses	100.8	
Fuel Savings	<u>(207.5)</u>	
Sub-Total		\$742.0
Increase Allocated to Growth		<u>(11.1)</u>
Total Increase		\$670.7

(a)		<u>Current</u>	<u>R-842590</u>
Limerick #1 & 100% Common Rate Base	\$3,710,373,000	-	
Non-Limerick Rate Base	<u>3,253,159,000</u>	<u>3,102,580,000</u>	
Total Rate Base	\$6,963,532,000	\$3,102,580,000	
Return on Original Cost	12.70%	13.27%	
Return on Equity	15.75%	16.75%	
Embedded Cost of Debt	10.84%	11.41%	
Embedded Cost of Preferred	10.54%	10.29%	
Capitalization Ratios			
Debt	50.7%	51.3%	
Preferred	10.8%	11.4%	
Equity	38.5%	37.3%	