

PENNSYLVANIA POWER & LIGHT COMPANY

**Exhibit DAK 2
1995-96 Construction Budget**

**Witness: Douglas A. Krall
Docket No. R-00943271**

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1995-1996 CONSTRUCTION BUDGET
PENNSYLVANIA POWER & LIGHT COMPANY

OCTOBER 1994

1995-1996 CONSTRUCTION BUDGET
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CHAPTER 1
INTRODUCTION

INTRODUCTION

A. GENERAL DISCUSSION

This report:

- Presents a discussion of the 1995 and 1996 Construction Budgets, the five- and ten-year construction programs and the major factors that influenced their development.
- Provides an estimate of exposure to additional capital financing. This exposure includes specific expenditures which are highly uncertain.

The purpose of the Construction Budget and its related cost data is to identify the capital requirements to support existing Company facilities and necessary expansions, and to establish a basis for financial and manpower planning. Further, the construction budget is a major document in developing future test year plant additions and retirements for rate case purposes. It also provides a process for early identification of projects which facilitates an orderly process of engineering, construction and long-term system development.

The recommended construction program is based on the loads resulting from PP&L's Least Cost Plan (LCP) filed with the Pennsylvania PUC May 1, and reflects an average annual compounded peak load growth rate of 1.8% for the period 1994 to 2004. With these loads, there is no need for new generating capacity and associated expenditures within the next five years. An analysis is included of the effect of higher loads than those resulting from the LCP.

The construction budget is based in large measure on a set of fundamental planning guidelines known as the Reliability Principles and Practices. These principles are intended to encourage imaginative solutions to planning problems while assuring a degree of uniformity in planning decisions and providing a balance between cost of service and reliability. These principles evolved over many years and were committed to writing in the late 1960's. They are constantly under review to determine needed refinements which reflect current thinking on load supply philosophies and recent advances in technology. A review of the Electrical Planning Principles and Practices was completed in 1988. Principles and Practices for Existing Fossil and Hydro Generating Stations are currently under review.

As business strategies continue to evolve in anticipation of a more competitive future, one of PP&L's objectives continues to be to maintain a stable, competitive price for our service. A key element in accomplishing this objective is a program of cost effective management which is applied to operating, payroll and capital budgets. The intent of this program is to assure that these budgets address the operational strategies and objectives of the Company and, at the same time, provide a mechanism to revise those strategies and objectives should their "cost" be inconsistent with financial and rate-making strategies.

The explanatory material included herein describes a Construction Program which, consistent with operational strategies, seeks to maintain the historically good performance of our existing facilities, and, also make additions and modifications where it is cost effective to do so. In support of financial objectives, however, certain projects were deferred beyond their desired in-service date. Projects which have

been deferred fall into one of the following general categories:

1. Performance improvements at fossil and hydro generating stations.
2. Transmission and distribution improvements which are not required to meet customer loads but could involve some exposures to increased interruption frequency and restoration times in the event of an equipment failure or maintenance outage.
3. Replacements in all categories where timing is a matter of judgment and deferral is judged not to incur significant risk.
4. Selected building-type projects in accordance with the 10-year General Buildings Program

CHAPTER 2

SUMMARY

CHAPTER 2
1995-1996 CONSTRUCTION BUDGET
SUMMARY

A. GENERAL DISCUSSION

The Construction Budget provides for expenditures (excluding nuclear fuel purchases) of \$386.9 million in 1995, and \$400.8 million in 1996. Requirements of \$2057.3 million are anticipated for the five-year period from 1995 through 1999. The dollar expenditures for the 1995-1999 five-year period are shown in Table 2-1.

Table 2-2 shows a comparison of estimates by budget category to those prepared in October 1993, for the 1995-2004 ten-year period.

A comparison of the 1995 budget estimate of \$386.9 million with the estimate prepared in October 1993 of \$397.8 million, shows a decrease of \$10.9 million. This decrease is discussed by category in each of the following chapters. Nuclear fuel purchases are included in Tables 2-1 and 2-2 for information purposes.

All data have been adjusted to reflect the effect of escalation. The rate used to escalate expenditures beyond 1995 was 3.0% per year through 2004. This rate is based on the 1994-1995 Corporate Planning Assumptions issued in July, 1994. Shown below is the estimate of escalation included in the 1995-1999 Construction Program.

\$ MILLION ESCALATION INCLUDED
ABOVE 1995 PRICE LEVEL

1995	-
1996	12
1997	27
1998	41
1999	35

The detailed financial data for the 1995 and 1996 Capital Construction Budgets are included as follows:

1995 Construction Budget

Table	2-3	Summary - Major Projects
	2-4	Summary - Construction Budget
	2-5	Expenditures By Class of Property
	2-6	Additions and Retirements to Plant

1996 Construction Budget

Table	2-7	Summary - Major Projects
	2-8	Summary - Construction Budget
	2-9	Expenditures By Class of Property
	2-10	Additions and Retirements to Plant

Tables 2-11 and 2-12 show the committed funds associated with each of the annual construction budgets. These estimates reflect funds necessary to complete the projects started prior to and during the respective budget years.

Listings of the individual projects included in the 1995 and 1996 Budgets are shown as Appendix A and B respectively. Included in Appendix C are the bulk power system map and seven regional maps. Each of these show the existing and planned bulk power and regional supply facilities and area substations through 1998.

In addition to the capital construction program of approximately \$2057.3 million for the 1995-1999 period, there is a potential for additional capital expenditures not included in the base capital plan. This is discussed in detail in Chapter 11 and listed in Table 11-1 on Page 11-2.

TABLE 2-1
1995-1999 CONSTRUCTION PROGRAM
ESTIMATED CONSTRUCTION EXPENDITURES
\$ MILLIONS (ESCALATED)

<u>Budget Category</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>TOTAL 1995-1999</u>	<u>% OF TOTAL</u>
New Generation	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Existing Generation Nuclear	49.5	45.0	42.8	40.5	36.0	213.8	10.4
Existing Generation Fossil and Hydro	105.1	116.6	214.5	241.1	90.7	768.0	37.3
Bulk Power	9.8	7.0	9.5	11.1	8.1	45.5	2.2
Regional Supply	36.6	36.0	37.8	46.0	41.1	197.5	9.6
Area Supply	48.3	46.6	47.2	50.1	47.2	239.4	11.6
Revenue Work	80.0	80.0	80.0	80.0	80.0	400.0	19.4
Sites and R/W	0.7	0.7	0.7	0.8	0.8	3.7	0.2
Buildings	9.9	6.3	7.3	2.0	2.0	27.5	1.3
(1) Other	47.0	62.6	38.0	6.9	7.4	161.9	8.0
Total New Construction	386.9	400.8	477.8	478.5	313.3	2,057.3	100.0
Nuclear Fuel Purchases	52.1	77.2	47.2	61.5	88.7	326.7	
Grand Total	439.0	478.0	525.0	540.0	402.0	2,384.0	

(1) Includes rounding adjustment.

TABLE 2-2
1995-2004 CONSTRUCTION PROGRAM
ESTIMATED ANNUAL EXPENDITURES
\$ MILLIONS (ESCALATED)

Budget Category	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	TOTAL 1995-2004
New Generation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Existing Generation Nuclear	49.5	45.0	42.8	40.5	36.0	27.0	27.0	27.0	27.0	27.0	348.8
	50.0	45.0	46.8	46.8	50.1	51.8	53.6	55.5	57.4	59.4	516.4
Existing Generation Fossil and Hydro	105.1	116.6	214.5	241.1	90.7	90.0	80.0	80.0	80.0	80.0	1,178.0
	116.9	139.9	188.5	164.8	224.5	193.3	131.6	75.0	99.2	76.1	1,409.8
Bulk Power	9.8	7.0	9.5	11.1	8.1	8.3	8.6	8.9	9.2	9.5	90.0
	13.6	10.8	8.1	8.5	8.8	9.1	9.4	9.8	10.1	10.4	98.6
Regional Supply	36.6	36.0	37.8	46.0	41.1	42.3	43.6	44.9	46.3	47.9	422.5
	38.8	50.0	49.6	53.2	55.1	57.0	59.0	61.1	63.2	64.5	551.5
Area Supply	48.3	46.6	47.2	50.1	47.2	48.7	50.2	51.7	53.3	54.9	498.2
	53.9	52.5	38.9	40.9	45.0	46.6	48.2	49.9	51.6	52.6	480.1
Revenue Work	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	800.0
	86.8	89.0	89.0	85.0	80.0	80.0	80.0	80.0	80.0	80.0	829.8
Sites and R/W	0.7	0.7	0.7	0.8	0.8	0.9	0.9	0.9	1.0	1.0	8.4
	0.7	0.7	0.8	0.8	0.9	0.9	0.9	1.0	1.0	1.0	8.7
Buildings	9.9	6.3	7.3	2.0	2.0	2.0	---	---	---	---	29.5
	3.9	5.4	1.5	1.6	1.6	1.3	---	---	---	---	15.3
Other	47.0	62.6	38.0	6.9	7.4	6.6	7.7	7.1	7.8	7.8	198.9
	33.0	29.1	11.6	7.8	7.7	8.7	8.5	8.5	8.8	9.0	132.7
Total New Construction	386.9	400.8	477.8	478.5	313.3	305.8	298.0	300.5	304.6	308.1	3,574.3
	397.6	422.4	434.8	409.4	473.7	448.7	391.2	340.8	371.3	353.0	4,042.9
Nuclear Fuel Purchases	52.1	77.2	47.2	61.5	88.7	49.2	65.0	91.5	54.4	71.9	658.7
	55.4	80.6	48.2	63.6	92.3	50.3	66.8	93.2	55.7	74.0	680.1
Grand Total	439.0	478.0	525.0	540.0	402.0	355.0	363.0	392.0	359.0	380.0	
	453.0	503.0	483.0	473.0	566.0	499.0	458.0	434.0	427.0	427.0	
Cumulative Grand Total	439.0	917.0	1,442.0	1,982.0	2,384.0	2,739.0	3,102.0	3,494.0	3,853.0	4,233.0	
	453.0	956.0	1,439.0	1,912.0	2,478.0	2,977.0	3,435.0	3,869.0	4,296.0	4,723.0	

TABLE 2-3
1995 SUMMARY - MAJOR PROJECTS

<u>Major Projects - Four Million Dollars or More in 1995</u>	Cost-Thousands	
	<u>1995 Budget Year</u>	<u>Project Total</u>
Susquehanna SES - Unit #2 - Replace Plant Computer System	4,590	9,829
Brunner Island SES - Unit #2 - Replace Horizontal Reheater and Superheater and Economizer	14,780	15,980
Brunner Island SES - Dry Fly Ash Conversion	9,000	26,061
Montour SES - Unit #1 - Replace Control System	5,803	6,946
Montour SES - Unit #1 - Install Low NOx Burners	8,470	15,970
Holtwood HES - Install Fish Passage Facilities	6,800	20,840
South Akron 230-138 KV Substation	4,438	12,322
Division Operations Department - "SIGHT" Project	30,500	103,900
Nuclear Department - "NIMS" Project	9,300	24,800
Total Major Projects	93,681	236,648

TABLE 2-4
 1995 SUMMARY - CONSTRUCTION BUDGET
 THOUSANDS OF DOLLARS - ESCALATED

	<u>1995 Budget Year</u>
<u>Major Projects - Subtotal from Table 2-3</u>	93,681
<u>Production - Additions, Replacements and Improvements to Generating Facilities</u>	99,741
<u>Transmission - Additions, Replacements and Improvements to Transmission Facilities</u>	10,130
<u>Distribution - Additions, Replacements and Improvements to Distribution Facilities</u>	79,991
<u>Revenue - Supply Additional Residential, Commercial, Industrial and Street Lighting Loads, Including Transformers and Meters</u>	76,090
<u>Buildings</u>	9,960
<u>General</u>	<u>4,255</u>
Total New Construction	373,848
<u>Net Removal Costs</u>	<u>12,963</u>
Total Construction Including Removals	386,811
<u>Nuclear Fuel Purchases</u>	<u>52,100</u>
Grand Total	438,911

TABLE 2-5
1995 CONSTRUCTION BUDGET *
BY CLASS OF PROPERTY
THOUSANDS OF DOLLARS-ESCALATED

<u>Class of Property</u>	<u>Prior to Budget Year</u>	<u>During Budget Year</u>	<u>After Budget Year</u>	<u>Total</u>
<u>Production</u>				
Nuclear	53,299	49,500	43,959	146,758
Fossil/Hydro	87,460	105,452	429,171	622,083
Sub-Total	140,759	154,952	473,130	768,841
<u>Transmission</u>				
	11,834	10,320	11,411	33,565
<u>Distribution</u>				
	36,008	167,424	138,775	342,207
<u>General</u>				
	23,070	54,115	96,070	173,255
Sub-Total	211,671	386,811	719,386	1,317,868
<u>Nuclear Fuel</u>				
		52,100	274,600	326,700
TOTAL	211,671	438,911	993,986	1,644,568

* Includes Removal Costs.

TABLE 2-6
1995 ESTIMATE OF ADDITIONS AND RETIREMENTS
FROM PLANT DURING BUDGET YEAR
THOUSANDS OF DOLLARS

<u>Class of Property</u>	*	<u>Additions To Plant</u>	<u>Retirements</u>
<u>Production</u>			
Nuclear		54,800	6,000
Fossil/Hydro		146,890	8,735
	Sub-Total	201,690	14,735
 <u>Transmission</u>			
		19,690	1,790
<u>Distribution</u>			
		152,800	19,160
<u>General</u>			
		18,140	330
	TOTAL	392,320	36,015

* Excludes Removal and Salvage Costs.

TABLE 2-7
1996 SUMMARY - MAJOR PROJECTS

Major Projects - Four Million Dollars or More in 1996

Cost-Thousands

	1996 Budget Year	Project Total
Susquehanna SES - Spent Fuel Storage Additions	6,026	11,290
Susquehanna SES - Replace Plant Computer System	4,728	10,279
Susquehanna SES - Unit #1 - Reactor Recirc. Pump Shaft Replacement	5,122	7,378
Martins Creek SES - Unit #3 - Convert to Gas Co-Firing	14,860	15,786
Sunbury SES - Add Dry Fly Ash Handling System	14,900	18,072
Sunbury SES - Add Waste Water Treatment	7,245	7,945
Montour SES - Unit #2 - Replace Control System	4,886	5,922
Montour SES - Unit #1 - Install Flue Gas Desulfurization	11,206	327,883
Holtwood HES - Install Fish Passage Facilities	12,340	20,840
West Hempfield 230-138 KV Substation	6,629	10,548
South Akron 230-138 KV Substation	4,996	12,327
Division Operations Department - "SIGHT" Project	46,800	103,900
Nuclear Department - "NIMS" Project	8,700	24,800
	<hr/>	<hr/>
Total Major Projects	148,438	576,970

TABLE 2-8
 1996 SUMMARY - CONSTRUCTION BUDGET
 THOUSANDS OF DOLLARS - ESCALATED

	<u>1996 Budget Year</u>
<u>Major Projects - Subtotal from Table 2-7</u>	148,438
<u>Production - Additions, Replacements and Improvements to Generating Facilities</u>	74,716
<u>Transmission - Additions, Replacements and Improvements to Transmission Facilities</u>	7,499
<u>Distribution - Additions, Replacements and Improvements to Distribution Facilities</u>	69,445
<u>Revenue - Supply Additional Residential, Commercial, Industrial and Street Lighting Loads, Including Transformers and Meters</u>	76,800
<u>Buildings</u>	2,835
<u>General</u>	<u>5,812</u>
Total New Construction	385,545
<u>Net Removal Costs</u>	<u>14,809</u>
Total Construction Including Removals	400,354
<u>Nuclear Fuel Purchases</u>	<u>77,200</u>
Grand Total	477,554

TABLE 2-9
1996 CONSTRUCTION BUDGET *
BY CLASS OF PROPERTY
THOUSANDS OF DOLLARS-ESCALATED

<u>Class of Property</u>	<u>Prior to Budget Year</u>	<u>During Budget Year</u>	<u>After Budget Year</u>	<u>Total</u>
<u>Production</u>				
Nuclear	43,374	45,000	16,985	105,359
Fossil/Hydro	25,916	117,217	432,787	575,920
Sub-Total	69,290	162,217	449,772	681,279
<u>Transmission</u>				
	1,667	7,552	13,701	22,920
<u>Distribution</u>				
	40,792	165,899	118,910	325,601
<u>General</u>				
	49,733	64,686	42,767	157,186
Sub-Total	161,482	400,354	625,150	1,186,986
<u>Nuclear Fuel</u>				
	52,100	77,200	197,400	326,700
TOTAL	213,582	477,554	822,550	1,513,686

* Includes Removal Costs.

TABLE 2-10
1996 ESTIMATE OF ADDITIONS AND RETIREMENTS
FROM PLANT DURING BUDGET YEAR
THOUSANDS OF DOLLARS

<u>Class of Property</u>	*	<u>Additions</u>	<u>Retirements</u>
		<u>To Plant</u>	
<u>Production</u>			
Nuclear		19,940	4,020
Fossil/Hydro		81,420	9,480
	Sub-Total	101,360	13,500
<u>Transmission</u>			
		4,040	370
<u>Distribution</u>			
		170,760	21,410
<u>General</u>			
		24,520	300
	TOTAL	300,680	35,580

* Excludes Removal and Salvage Costs.

TABLE 2-11
FUNDS COMMITTED IN 1995 *
THOUSANDS OF DOLLARS-ESCALATED

	Prior To 1995	During 1995	After 1995
Projects started prior to 1995 and completed during 1995	154,678	130,703	
Projects started prior to 1995 and completed after 1995	56,993	103,529	645,971
Projects to be started and completed during 1995		148,674	
Projects to be started in 1995 and completed after 1995		3,905	73,415
TOTAL	211,671	386,811	719,386
		1,106,197	

TABLE 2-12
FUNDS COMMITTED IN 1996 *
THOUSANDS OF DOLLARS-ESCALATED

	Prior To 1996	During 1996	After 1996
Projects started prior to 1996 and completed during 1996	58,465	92,097	
Projects started prior to 1996 and completed after 1996	103,017	135,952	490,706
Projects to be started and completed during 1996		165,804	
Projects to be started in 1996 and completed after 1996		6,501	134,444
TOTAL	161,482	400,354	625,150
		1,025,504	

* Excludes Nuclear Fuel.

B. ENVIRONMENTAL EXPENDITURES

The costs of facilities included in the budget which are attributable to environmental preservation and enhancement for the 1995-1999 period are as follows:

TABLE 2-13
ENVIRONMENTAL EXPENDITURES
\$ MILLIONS - ESCALATED

	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	Total <u>1995-1999</u>
Air Quality	0.3	0.3	0.0	0.0	0.0	0.6
Water Quality	3.7	10.4	0.9	0.0	0.0	15.0
Solid Waste Disposal	13.7	24.1	4.9	6.7	4.2	53.6
Clean Air Act	19.9	14.2	148.0	194.0	43.5	419.6
Aesthetics	2.0	2.0	2.0	2.0	2.0	10.0
Other	0.5	0.5	0.5	0.5	0.5	2.5
Total 1995-1996 Budget	40.1	51.5	156.3	203.2	50.2	501.3
Total 1994-1995 Budget	54.9	105.3	165.8	145.6	50.0	521.6

The primary reason for the significant decrease in the environmental costs from the 1993-1997 Construction Program is due to the refinement of the compliance plan to meet the Clean Air Amendments, and rescheduling of projects. A more detailed discussion is included in Chapter 5, Existing Generation - Fossil and Hydro.

There are potential capital expenditures in environmental costs identified in Chapter 11 which are not included in Table 2-13.

The environmental expenditures shown in Table 2-13 have been segregated into six

categories. They are:

- The Air Quality category represents costs to maintain facilities at the generating plants to monitor and control emissions to meet existing state and federal regulations.
- The Water Quality category represents costs to build and maintain facilities at the generating plants to meet state and federal regulations for waste and thermal discharge and ground water contamination.
- The Solid Waste category represents costs to build and maintain facilities at the generating plants to permanently store solid wastes such as fly ash, bottom ash, and mill rejects.
- The Clean Air Act category represents costs to add equipment at the generating stations to meet new federal regulations governing sulfur dioxide and nitrous oxide emissions.
- The Aesthetics category represents costs for transmission and distribution facilities which are spent for environmental enhancement. These costs are for substation landscaping to blend with the surroundings, covered overhead conductors, upswept crossarms, and installation of underground facilities.
- The "Other" category is for miscellaneous facilities such as modifications made at the recreation areas or to general properties (service centers, etc.) to comply with environmental regulations.

C. NET REMOVAL COSTS

Net removal costs refer to the removal costs less salvage recovered for capital property that is being retired. The project cost estimates for the 1995-1999 Budgets presented in this report include these net removal costs in the total project estimates.

With the significant amount of equipment replacements at fossil and hydro plants, the potential for large removal costs at Susquehanna SES, and the continuing improvements being made to the electrical system, removal costs have increased to a significant level (actual removal costs less salvage amounted to \$21.7 million in 1993).

The Financial Department has requested that these costs be identified separately for budgeting and reporting purposes.

CHAPTER 3

BUDGET DISCUSSION - NEW SUPPLY/DEMAND-SIDE EXPENDITURES

CHAPTER 3
BUDGET DISCUSSION - NEW SUPPLY/DEMAND-SIDE EXPENDITURES

A. OVERVIEW

The objective of system development is to ensure a reliable and economic energy supply for PP&L's customers now and in the future. Developing and maintaining a system that provides a reliable and economic energy supply continues to be a challenge, given the uncertainty in key planning assumptions (such as load growth and fuel prices) and the changing regulatory and economic environment. PP&L's strategy to deal with these uncertainties is to maintain a flexible mix of resource options, balancing supply-side and demand-side options. The optimal use of existing resources will continue to be a priority.

PP&L files a 20-year projection of resource needs, along with the supply-side and demand-side options to meet those needs, with the Pennsylvania Public Utility Commission (PPUC) in May of each year. This is the so called Least Cost Plan (LCP).

The current supply-side and demand-side efforts:

- continue to support the long-term corporate objective to defer the need for additional central station generation into the 21st century.
- recognize that PP&L has sufficient capacity resources to continue with its strategy of bulk power marketing for the 1990s.

PP&L plans no new generating facilities in the Construction Budget. However, PP&L has several capital projects under way that will result in improved efficiency and output of existing generating units. These projects are the uprate of the Susquehanna SES unit 1 (the uprate of Susquehanna SES Unit 2 was completed in June 1994) and the

rebuild of the Sunbury Unit 1 steam turbine. PP&L is moving ahead with the regulatory approval process and technical analyses of converting the two oil-fired generating units at Martins Creek plant to allow use of gas for up to 50% of capacity on an interruptible basis.

Demand-side management (DSM) is an important element of PP&L's strategy to meet customer electric energy needs. DSM includes conservation and load management programs. In March 1994, PP&L filed a comprehensive DSM plan with the PPUC. The plan included programs encompassing industrial, commercial, and residential customers. PP&L's resource planning process helps ensure that the most appropriate DSM programs are pursued. PP&L will continue to evaluate DSM programs and make changes as required.

There are capital expenditures included in the Construction Budget specifically for the DSM program on area lighting. However, most programs are currently in the Operating Budget. Other individual projects in the Capital Budget contribute to DSM efforts by improving efficiency in energy use in PP&L system facilities as a result of equipment upgrade or replacement for other reasons (for example, the replacement of failed transformers with low-loss transformers because that option is economically justified).

The optimal use of existing resources (including generating capacity and transmission capability) will involve meeting system needs along with bulk power marketing to others. Each of these efforts must recognize the trend in the utility industry toward a more competitive market. For instance, PP&L participates in other utility requests for proposals (RFP) for capacity and energy when it is in PP&L's best interest.

B. CURRENT EFFORTS

The following describe PP&L's current supply-side and demand-side efforts in support of long-term objectives and the current resource utilization efforts.

1. Supply-Side Efforts

Although PP&L does not have plans for new generating facilities in the budget, PP&L has several projects under way which are intended to maintain or improve the capability of existing generating units, improve their availability, or *increase the economic incentive to dispatch their generation.*

a) Susquehanna SES

PP&L has completed studies that show it is economically and technically feasible to uprate these units to increase the output by about 5 percent. Based on these studies, PP&L has notified the Nuclear Regulatory Commission of the Company's intent to proceed with the development of a power uprate license amendment submittal. The uprate of Unit 2 was completed in mid-1994. The uprate for Unit 1 will be complete in mid-1995. PP&L's share of the uprate for both units totals 90 MW. PP&L's share of the costs are estimated to be \$40 million.

b) Sunbury SES

Sunbury Unit 1 steam turbine components, which are in excess of 40 years of age and deteriorated, are being replaced to eliminate risk of a failure of these components and resultant lengthy outage. The total cost of the Unit 1 turbine project is estimated to be approximately \$12 million. Similar work on Unit 2 has recently been completed.

c) Martins Creek Units 3 and 4 Co-fire

PP&L's analyses have indicated that modifying the two oil-fired generating units at the Martins Creek plant to burn both oil and natural gas will offer economic benefits, benefits of diversity and flexibility in fuel supply, and environmental advantages.

Natural gas at the well-head, and natural gas transportation are available at a cost that is lower than the delivered cost of oil in many months of the year. This gives natural gas a competitive price advantage over oil during that time. Additionally, PP&L is in a relatively favorable position since it can receive gas transportation services from three interstate pipelines, as well as one local distribution company. Plans are to provide capability for gas co-firing up to 50% on an interruptible basis. Providing greater than 50% of the heat input from gas would require costly modifications of heat transfer surfaces which make that option less economically attractive.

While moving ahead with the regulatory approval process that would allow gas co-firing, PP&L is also working toward completion of technical analyses related to gas supply and equipment for the conversion. These activities are proceeding such that the modification of Unit 3 is expected to be complete in March 1996, and Unit 4 in December 1996. Capital costs associated with both the boiler modifications and required in-plant distribution piping for 50% gas co-firing are estimated to be about \$28 million.

2. Demand-Side Efforts

DSM represents is an element of PP&L's strategy to meet customer electric

energy needs. DSM helps achieve long-term corporate objectives to maintain base rate stability, provide a fair return on common equity, and defer the need for additional central station generation.

PP&L filed a comprehensive DSM plan with the PPUC in March 1994 that included programs encompassing industrial, commercial and residential customers. PP&L's activities in DSM continue to evolve as existing programs are monitored, new programs are developed, and market research data is gathered.

PP&L's DSM objectives will continue to be to design and implement programs that: promote the profitability and comfort of our customers by meeting their electric energy needs, increase sales (within the overall policy objectives of the PPUC to manage demand), defer more costly supply-side resources, and increase both supply and end-use efficiencies.

PP&L's DSM plan affects the Company's budgets, particularly the Operating Budget. The continuation of existing programs is already reflected in the Company's budgets. This budget does not reflect allocations for expansion of new programs beyond the pilot stage.

3. Resource Utilization Efforts

One avenue for PP&L to optimize use of its resources is to pursue various utility RFPs for capacity and/or energy. PP&L is currently evaluating utility RFPs as opportunities become available. A Bulk Power Marketing team, consisting of Marketing, System Operating and System Planning personnel regularly visits regional utilities to determine potential bulk power marketing opportunities, both conventional and unconventional. This team has participated in other utility solicitations for capacity and energy.

C. PLANNING BASIS

"Base Case" conditions for this budget review are PP&L's 1994 LCP loads and other current assumptions. The LCP loads reflect an overall peak load growth rate of 1.8% for the period 1994 to 2004. Other key assumptions include:

- The PJM reserve requirement will be 22% through May 1994, 21.5% through May 1995, 21% through May 1996, 20.5% through May 1997 and 20% thereafter.
- Traditional and non-traditional bulk power sales that affect either PP&L's capacity or obligation will remain at current contract levels, unless specific changes are known or planned.
- The output of NUG within PP&L service area will remain at the current level of 504 MW.
- The Clean Air Act will not significantly affect available capacity resources in the 1990s. By the year 2005, PP&L's installed capacity will be derated by 53 MW as a result of SO₂ scrubber energy requirements.

The discussion that follows provides a review of:

- PP&L's existing generating capability, including NUG output.
- DSM programs.
- PP&L's Resources/Obligations (R/O) for the LCP loads and for the LCP High Loads and LCP Low Loads as exposure cases.

D. PP&L's EXISTING GENERATOR CAPABILITY (INCLUDING NUG OUTPUT)

Existing PP&L generation capability for the summer and winter is shown in Table 3-1. Included in the summary is 504 MW of NUG output.

E. PP&L's EXISTING DEMAND-SIDE MANAGEMENT

DSM is both a factor in the resource planning process and an opportunity to respond to customers' electric energy needs.

A managed growth strategy is an important part of PP&L's current DSM efforts to optimize use of our existing resources while meeting our customers' needs. PP&L's DSM programs emphasize efficient use of electrical energy. These programs promote energy audits, off-peak heating systems, high efficiency heat pumps, and industrial and commercial energy efficiency improvements.

PP&L's DSM resources also include a block of interruptible load which provides peak load reduction during system emergencies. PP&L has established tariffs for interruptible load customers, whereby PP&L may interrupt all or part of their load for system reliability or for economic conditions. Tables 3-2, 3-3, and 3-4 include an estimated 229 MW of interruptible load.

Under PJM procedures, PP&L maximizes the benefits available from interruptible load by allowing PJM to coordinate the interruption of these customers during capacity emergencies. The PJM procedure allows PP&L to claim the interruptible load plus an additional approximately 20% as a capacity resource to reflect the company reserves that otherwise would have been needed.

F. PP&L's RESOURCES/OBLIGATIONS

Considerations that influence future R/O are discussed below and are integrated in the R/O summaries that are presented later.

1. Use of Existing Capacity

PP&L currently has no current plans to retire any of its existing generating

units for the period 1994-2013, although this could change as the utility industry environment changes. Continuing the operation of PP&L's generating plants can be preferable to their retirement and replacement with new generating capacity. PP&L has projects under way that are intended to improve or avoid reductions in the availability and efficiency through the addition of new equipment. Projects also are under way to replace old and deteriorated equipment to restore performance or avoid performance degradation. As discussed in Section B, two such projects are the Susquehanna SES uprate and Sunbury turbine rebuild.

2. Load Growth

- LCP Loads

The LCP loads reflect the expected level of customer sales and peak load growth over the 20 year planning horizon.

- Exposure Case - LCP High Loads 2.4% Peak Load Growth

This case has been developed as an alternate to the LCP loads and is presented to illustrate the impact of peak load growth that exceeds current expectations. The high loads exposure case assumptions include increased market share, higher customer average use, and higher service area population growth. This exposure case assumes that the annual growth rate will average 0.6% (55 MW/year) higher than the LCP base case growth rate.

- Exposure Case - LCP Low Loads 1.0% Peak Load Growth

This case has been developed as an alternate to the LCP loads and is presented to illustrate the impact of peak load growth that does not meet current expectations. The low loads exposure case assumptions include loss of market share, lower customer average use, and a slower service

area population growth. This exposure case assumes that the annual growth rate will average 0.8% (55 MW/year) less than the LCP base case growth rate.

For reference, growth rates associated with the projections noted above are summarized in the table below:

	<u>Peak Growth Rates</u>	
	<u>%</u>	<u>1994-2004 MW/Year</u>
LCP	1.8	125
High Loads Exposure	2.4	180
Low Loads Exposure	1.0	70

3. PP&L's Obligation to PJM

The PJM pool's installed capacity requirement is apportioned among PJM member companies according to rules and procedures prescribed within the PJM Agreement based on the PJM Reserve Requirements of between 20%-22%.

4. Bulk Power Sales (Traditional) and Purchases

In addition to meeting the needs of PP&L's customers, PP&L is marketing to others to the extent PP&L has capacity and/or energy available.

PP&L's net resources reflect PP&L transactions (capacity and energy) with Atlantic Electric (AE), Jersey Central Power & Light (JCP&L), Baltimore Gas & Electric (BG&E), and NUGs.

a) Atlantic Electric (AE) Sale

In June 1983, PP&L and AE signed a contract under which AE agreed

to purchase approximately 125 MW (129 MW based on winter ratings) of PP&L's coal-fired capacity from October 1991 through September 2000.

b) Jersey Central Power & Light (JCP&L) Sale

In 1985, PP&L entered into a long-term sales agreement with JCP&L, a General Public Utilities (GPU) subsidiary. Under the terms of this sale, PP&L provides JCP&L with 945 MW (winter ratings) of PP&L's electrical generating capacity and related energy through the end of 1995. This sale involves an equal percentage entitlement to capacity and associated energy from all generating units in which PP&L has an ownership or lease interest. After 1995, the sale decreases uniformly (at 20% per year) until the expiration of the contract in December 1999.

The return of this sale to PP&L presents several opportunities because these resources will be available for customer use and/or new bulk power sales.

c) Baltimore Gas & Electric (BG&E) Sale

In 1988, BG&E agreed to purchase, for 10 years commencing in October 1991, the 5.94% (currently 129 MW summer rating) portion of SSES previously sold to AE. Pursuant to this agreement and a 1989 supplement, BG&E has the option to purchase capacity credits from PP&L. Information regarding capacity credits sales is provided in Section F5.

d) NUG Purchase

PP&L currently has 504 MW of NUG output nominated as a capacity

resource for PJM installed capacity accounting purposes. The NUG contracts are of various lengths with the longest being about 20 years. Some contracts begin to expire in four to eight years. This may have an effect on PP&L's need for new capacity. For planning purposes, it is assumed that the contracts will be extended.

5. Other Sales - Non-Traditional

PP&L also enters into sale arrangements that reflect capacity needs as well as energy needs. To meet these sales arrangements, PP&L has undertaken unique forms of marketing its resources beyond current needs. PP&L is well positioned in both type and amount of bulk power resources to continue marketing into the early part of the next century.

PP&L has signed contracts and continues to negotiate new contracts for the sale of various system entitlements. These contracts can generally be classified into the following types:

a) Capacity Credits

Capacity credit sales allow a PJM company, which might otherwise be short of its capacity obligation to PJM, to claim the selling company's capacity credits to contribute toward satisfying the buying company's capacity obligation. The capacity credits sold are from the total system capacity, not from specific generating units, and do not entitle the buying company to any energy and are therefore not reflected as a reduction in PP&L's net resources. Instead, capacity credit sales are reflected as additional PP&L obligations.

- A sale of this type was packaged with the Susquehanna capacity and energy sale to BG&E (discussed earlier). The sale allows BG&E

to take up to 275 MW of capacity credits October 1991 through May 2001. Currently arranged firm purchases include 50 MW from June 1994 through May 1995 and 183 MW from June 1995 through May 1996.

- PP&L entered into an agreement with PEPCO in 1994 for the sale of 147 MW of capacity credits from June 1994 through May 1995.
- PP&L entered into an agreement with GPU in December 1989 for the sale of NUG energy plus 390 MW of capacity credits for June 1991 through May 1995.
- In addition, agreements also signed in 1991 with BG&E, GPU and AE and in 1994 with PEPCO provide for periodic capacity credit sales as mutually agreed upon.

b) Reservations of Output Sales

A market outside of PJM has developed under which non-PJM companies reserve generating plant output and occasionally purchase the output on call. Buyers pay a non-refundable reservation charge for the available output and also pay PP&L's cost for any output that is purchased including lost PJM savings. PP&L retains the right to recall the output when needed for PJM emergencies. Such agreements were signed with a number of entities outside PJM for short-term purchases. Because the output available through these transactions is recallable, it is not reflected as a reduction to resources.

c) Transmission Entitlements

Another type of sale involves PP&L's share of the right to use the PJM

transmission system for importing economical energy from systems to the west of PJM. PP&L's share of this transmission capability can be sold at a price benefiting both the buyer and seller. This transmission capability is being offered in whole or part to all PJM companies at monthly auctions or through two-party agreements. Such sales have no effect on PP&L's R/O.

The maximum sales that can result from these arrangements is dependent, in part, on the continuing needs of PJM companies and companies external to PJM and, in part, on the actions of other utilities that may have capacity and energy available for sale.

6. Resources/Obligations - Charts/Tables

The charts (Charts 3-1, 3-2, and 3-3) and tables (Tables 3-2, 3-3, and 3-4) at the end of this chapter provide R/O details for the LCP Loads, High Loads and Low Loads cases as previously discussed.

The charts provide a graphical representation of PP&L's R/O for the 1994 to 2004 time period. They also indicate the need for and timing of new resources and opportunities for bulk power transactions. The two-page summary tables show PP&L's R/O for the 1994 to 2013 period.

For ease of comparison, a combination chart (Chart 3-4) shows PP&L's R/O for each of the three cases graphed side-by-side.

a) R/O Summary - LCP Loads

Table 3-2 and Chart 3-1 show PP&L's R/O Summary based on the June 1994 LCP loads. Net resources reflect sales and purchases of capacity and energy arrangements with AE, BG&E and JCP&L; NUG output, and

interruptible load. PP&L's total obligations include PP&L's obligation to PJM and capacity credit sales.

This base case indicates that PP&L does not have a need for additional capacity until 2008. PP&L has sufficient resources available to make additional bulk power sales in most years and to have a margin available for higher-than-forecast load growth.

b) R/O Summary - LCP High Loads Peak Growth Exposure Case

Table 3-3 and Chart 3-2 show PP&L's R/O Summary based on the LCP High Loads Peak Growth projections previously described.

As capacity returns from the various sales, a surplus between 510 MW and 260 MW is projected from 1995 to 2002. However, beginning in 2004, it is projected that PP&L has an exposure to a long-term deficiency.

c) R/O Summary - LCP Low Loads Peak Growth Exposure Case

Table 3-4 and Chart 3-3 show PP&L's R/O Summary based on the LCP Low Loads Peak Growth projections previously described.

It is projected that PP&L has a significant surplus of capacity through 2013.

d) Other Exposures

BG&E Capacity Credit Sale -- PP&L has contracted to provide up to 275 MW of capacity credits to BG&E through May 2001 at a price of about 85% of the PJM installed capacity rate. Because BG&E is not required to firm up its required capacity credit purchases until two years

in advance of a planning year, PP&L must project BG&E's needs and the availability and cost of capacity credits from others to assess PP&L's resources. The R/O cases assume BG&E will not purchase any of the 275 MW of capacity credits during the planning period 1996-2000 because the contract price is above the current market price.. This estimated amount of BG&E's need is a function of BG&E's anticipated peak load growth and performance of its nuclear plant, Calvert Cliffs, as well as the availability of other economic resources in the pool. There is an exposure that BG&E could require some of the 275 MW of capacity credits if the peak load growth is higher than expected, the value of capacity credits increases, or Calvert Cliffs does not perform as expected. PP&L's available resources for PJM installed capacity accounting would decrease by the amount of capacity credits BG&E requires. The amount of capacity credits BG&E elects to take from PP&L will be a function of their need and the availability and price of capacity from others.

NUG -- There is an exposure that a few NUGs on the PP&L system face an uncertain financial future. In addition, as the NUG contracts expire, there is an exposure that some NUG may not renew contracts with PP&L. A NUG failure and/or contract termination would directly affect PP&L resources.

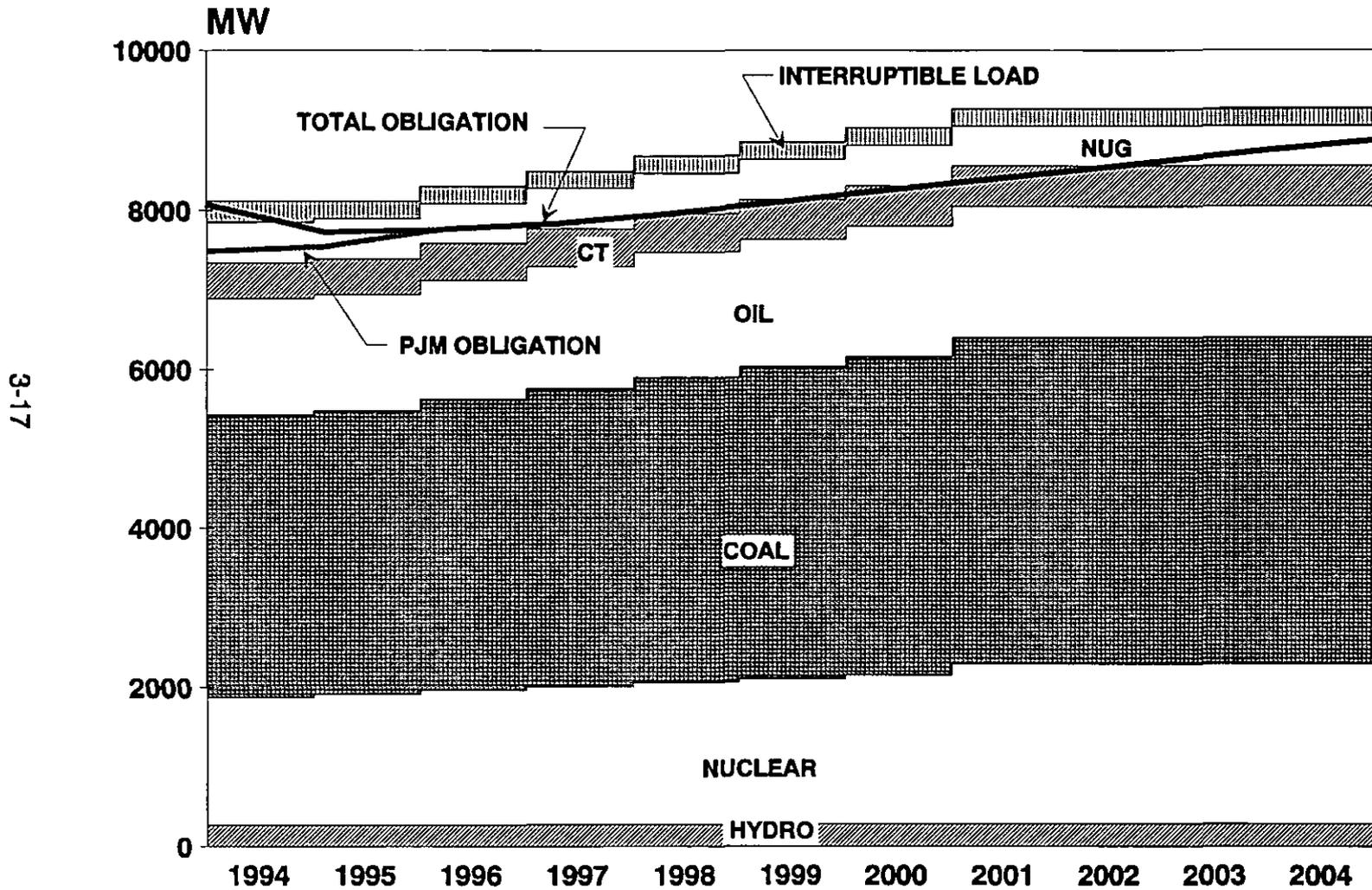
TABLE 3-1

PENNSYLVANIA POWER & LIGHT COMPANY
GENERATION CAPABILITY AS OF OCTOBER 1994⁽¹⁾
NET MW

	<u>Station</u>	<u>Net Capability -- MW</u>	
		<u>Summer</u>	<u>Winter</u>
<u>Hydro</u>	1. Holtwood SES	102	102
	2. Wallenpaupack HES	44	44
	3. Safe Harbor HES (PP&L Share)	<u>139</u>	<u>139</u>
	Total Hydro	285	285
<u>Nuclear</u>	4. Susquehanna	1,921	1,950
<u>Coal</u>	5. Brunner Island	1,434	1,469
	6. Montour	1,505	1,525
	7. Sunbury	362	389
	8. Martins Creek Units 1 and 2	280	300
	9. Holtwood	72	73
	10. Keystone (PP&L Share)	210	210
	11. Conemaugh (PP&L Share)	<u>194</u>	<u>194</u>
	Total Coal	4,057	4,160
<u>Oil</u>	12. Martins Creek Units 3 and 4	1,640	1,640
	13. Diesels	22	22
	14. Combustion Turbines	<u>374</u>	<u>486</u>
	Total Oil	2,036	2,148
<u>NUG</u>	15. Non-Utility Generation	<u>504</u>	<u>504</u>
	TOTAL CAPABILITY (Effective 10/1/94)	8,803	9,047

(1) PP&L has sales arrangements with AE, JCP&L, GPU and BG&E, which reduce the capacity levels indicated for the term of the sales.

PP&L RESOURCES / OBLIGATIONS 1994 LCP LOADS



TOTAL OBLIGATION INCLUDES CAPACITY CREDIT SALES AND PJM OBLIGATION

TABLE 3-2
PP&L's Resources / Obligations Summary
1994 LCP MEDIAN LOADS

PJM Reserve Requirement -- 22.0% (1994), 21.5% (1995), 21% (1996), 20.5% (1997), 20% (1998-2013)

Planning Period	(1) Peaks (MW) Summer Winter		(2) Net Resources (MW)	PP&L Obligations					(6) Net Resources over Total Obligation MW %		
				To PJM (3)		Capacity Credits (MW) (4)					(5) Total Obligation (MW)
				Estimated Obligation (MW)	% Over Winter Peak	BG&E (Est.)	PEPCO	GPU			
1994	5,550	6,635	8,117	7,481	12.8%	50	147	390	8,068	50	(7) 0.6%
1995	5,665	6,760	8,159	7,542	11.6%	183	0	0	7,725	430	(7) 5.8%
1996	5,765	6,830	8,348	7,759	13.6%	0	0	0	7,759	590	7.6%
1997	5,840	6,960	8,537	7,831	12.5%	0	0	0	7,831	710	9.1%
1998	5,965	7,095	8,726	7,962	12.2%	0	0	0	7,962	760	9.5%
1999	6,075	7,240	8,897	8,117	12.1%	0	0	0	8,117	780	9.6%
2000	6,200	7,375	9,068	8,277	12.2%	0	0	0	8,277	790	9.5%
2001	6,325	7,500	9,329	8,424	12.3%	0	0	0	8,424	910	10.8%
2002	6,435	7,645	9,329	8,577	12.2%	0	0	0	8,577	750	8.7%
2003	6,560	7,775	9,329	8,731	12.3%	0	0	0	8,731	600	6.9%
2004	6,685	7,900	9,329	8,871	12.3%	0	0	0	8,871	460	5.2%
2005	6,795	8,025	9,312	9,012	12.3%	0	0	0	9,012	300	3.3%
2006	6,900	8,150	9,312	9,152	12.3%	0	0	0	9,152	160	1.7%
2007	7,010	8,265	9,312	9,281	12.3%	0	0	0	9,281	30	0.3%
2008	7,115	8,380	9,312	9,410	12.3%	0	0	0	9,410	-100	-1.1%
2009	7,220	8,485	9,312	9,528	12.3%	0	0	0	9,528	-220	-2.3%
2010	7,325	8,590	9,312	9,646	12.3%	0	0	0	9,646	-330	-3.4%
2011	7,415	8,695	9,312	9,764	12.3%	0	0	0	9,764	-450	-4.6%
2012	7,520	8,790	9,312	9,871	12.3%	0	0	0	9,871	-560	-5.7%
2013	7,615	8,895	9,312	9,989	12.3%	0	0	0	9,989	-680	-6.8%

Notes:

- (1) Peaks include expected transactions with Luzerne Electric and other FERC customers. The peak load data is for PL System, not PL Group.
- (2) This column reflects the net effect of Capacity and Energy arrangements with AE, BG&E, and JCP&L and includes the additional resources (NUG output and Interruptible Load) as shown on page 2 of this table.
- (3) PP&L's allocated share of PJM's installed capacity obligation as determined in the PJM Agreement. The estimated forecast obligation shown was determined using installed capacity obligation for PL Group (PL & LU). This obligation is customarily presented in terms of summer rated capacity. The "Winter" obligation is an equivalent value adjusted by the difference between PL Summer and Winter installed capacity. 1994 and 1995 are estimated based on the latest after-the-fact obligation calculation. The obligations for 1996-2003 are based on the PJM Load and Capacity Forecast and the Allocation of Forecast Requirements dated July 14, 1994. Obligations for years 2004-2013 are calculated assuming a 12.3% reserve over winter peak (same as 2003)
- (4) PP&L's additional obligations are those resulting from capacity credit sales arising from two party agreements. The GPU and PEPCO sales are firm.
- (5) PP&L's Total Obligation is the sum of its PJM Obligation and Capacity Credit Sales.
- (6) Net Resources over Total Obligations is PP&L's Net Resources in excess of PP&L's Total Obligations.
- (7) The net resources shown for 1994 and 1995 are based on a PJM obligation calculated on an after-the-fact accounting method which uses the latest PP&L peak load and unit performance forecasts.

TABLE 3-2 (Continued)
PP&L's Resources / Obligations Summary
 1994 LCP MEDIAN LOADS
 Further Details and Background data
 (Megawatts)

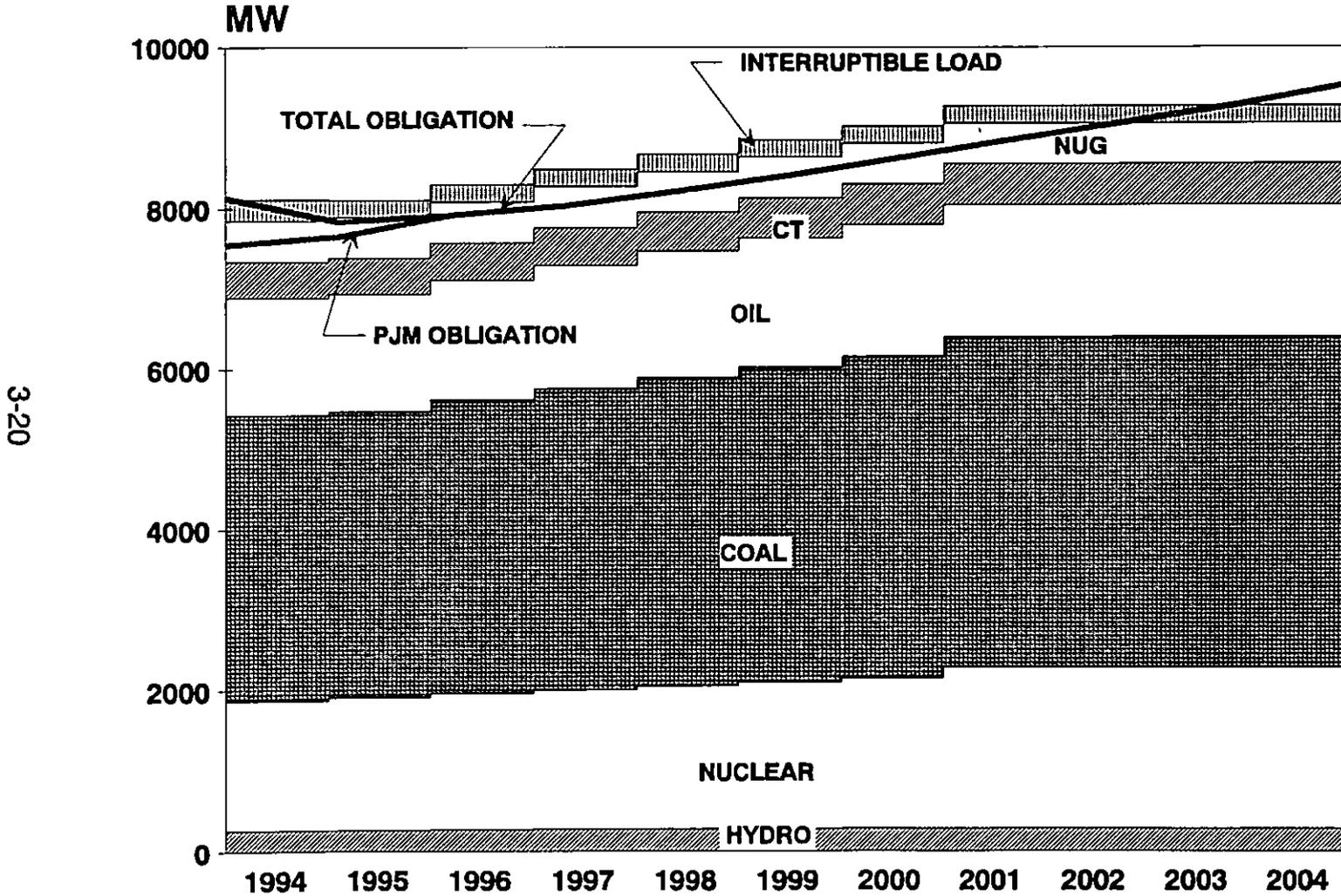
Planning Period	(1) Existing Capacity	(2) Capacity Additions & Retires	(3) Capacity Retirements & Derates	(4) Utility Purchases/Sales			(5) NUGs	(6) Net Installed Including NUG	(7) Demand-Side Resources		(8) Net Resources	Reserve as Percent of Winter Peak
				AE	BG&E	JCP&L			IL (Load Value)	IL (Used as a Resource)		
1994	8,498	45	0	-129	-129	-945	504	7,844	229	273	8,117	22%
1995	8,543	45	0	-129	-132	-945	504	7,886	229	273	8,159	21%
1996	8,588	0	0	-129	-132	-756	504	8,075	229	273	8,348	22%
1997	8,588	0	0	-129	-132	-567	504	8,284	229	273	8,537	23%
1998	8,588	0	0	-129	-132	-378	504	8,453	229	273	8,726	23%
1999	8,588	0	-18	-129	-132	-189	504	8,624	229	273	8,897	23%
2000	8,570	0	-18	-129	-132	0	504	8,795	229	273	9,088	23%
2001	8,552	0	0	0	0	0	504	9,058	229	273	9,329	24%
2002	8,552	0	0	0	0	0	504	9,058	229	273	9,329	22%
2003	8,552	0	0	0	0	0	504	9,058	229	273	9,329	20%
2004	8,552	0	0	0	0	0	504	9,058	229	273	9,329	18%
2005	8,552	0	-17	0	0	0	504	9,039	229	273	9,312	16%
2006	8,535	0	0	0	0	0	504	9,039	229	273	9,312	14%
2007	8,535	0	0	0	0	0	504	9,039	229	273	9,312	13%
2008	8,535	0	0	0	0	0	504	9,039	229	273	9,312	11%
2009	8,535	0	0	0	0	0	504	9,039	229	273	9,312	10%
2010	8,535	0	0	0	0	0	504	9,039	229	273	9,312	8%
2011	8,535	0	0	0	0	0	504	9,039	229	273	9,312	7%
2012	8,535	0	0	0	0	0	504	9,039	229	273	9,312	6%
2013	8,535	0	0	0	0	0	504	9,039	229	273	9,312	5%

Notes:

- (1) PP&L's total existing capacity shown reflects the winter ratings of all units.
- (2) Capacity additions/unit retires reflect the following:
 PP&L's share of the SSES updates : Unit 2, 45MW (8/84) and Unit 1, 45MW (8/85).
- (3) Capacity retirements/unit derates reflect the following: Estimated net capacity reduction resulting from the installation of scrubbers to comply with the Clean Air Act.
 1999 - Montour Unit 1 (18MW)
 2000 - Montour Unit 2 (18MW)
 2005 - Brunner Island Unit 3 (17MW)
- (4) The Purchases/Sales indicated reflect the Capacity and Energy arrangements with AE, BG&E and JCP&L.
 - Atlantic Electric (AE): Agreement with AE for 129 MW (winter rating) PL coal fired generation 10/1/91 thru 9/30/00
 - Baltimore Gas & Electric (BG&E): Agreement with BG&E for the sale of capacity and energy associated with 5.84 % of SSES 10/1/91 thru 5/31/01.
 - Jersey Central Power & Light (JCP&L): Agreement with JCP&L to purchase a 945 MW slice of System Capacity and Energy thru 12/85.
 After 1985 the sale decreases uniformly (20%/yr) until expiration 12/31/99.
- (5) 504 MW of NUG on PP&L's system is claimed as capacity as of 6/1/92.
- (6) Net Installed Including NUG is the measure of PP&L's total supply-side resources available to meet the energy needs of its customers.
- (7) Demand-Side Resources available to PP&L which can be used to enhance system reliability and PP&L's resource mix.
- (8) Net Resources are the sum of PP&L's Net Installed Capacity Including NUG and Interruptible Load Credit.

PP&L RESOURCES / OBLIGATIONS 1994 HIGH LOADS

CHART 3-2



TOTAL OBLIGATION INCLUDES CAPACITY CREDIT SALES AND PJM OBLIGATION

**TABLE 3-3
PP&L's Resources / Obligations Summary**

1994 LCP HIGH LOADS

PJM Reserve Requirement -- 22.0% (1994), 21.5% (1995), 21% (1998), 20.5% (1997), 20% (1998-2013)

Planning Period	(1) Peaks (MW) Summer Winter		(2) Net Resources (MW)	PP&L Obligations					(5) Total Obligation (MW)		(6) Net Resources over Total Obligation MW %	
				To PJM (3)		Capacity Credits (MW) (4)						
				Estimated Obligation (MW)	% Over Winter Peak	BG&E (Est.)	PEPCO	GPU				
1994	5,596	6,690	8,117	7,543	12.8%	50	147	390	8,130	-10	(7) -0.1%	
1995	5,749	6,860	8,159	7,654	11.6%	183	0	0	7,837	320	(7) 4.1%	
1996	5,883	6,970	8,348	7,918	13.6%	0	0	0	7,918	430	5.4%	
1997	5,991	7,140	8,537	8,034	12.5%	0	0	0	8,034	500	6.2%	
1998	6,154	7,320	8,726	8,214	12.2%	0	0	0	8,214	510	6.2%	
1999	6,293	7,500	8,897	8,408	12.1%	0	0	0	8,408	490	5.8%	
2000	6,465	7,690	9,068	8,631	12.2%	0	0	0	8,631	440	5.1%	
2001	6,645	7,880	9,329	8,851	12.3%	0	0	0	8,851	480	5.4%	
2002	6,801	8,080	9,329	9,065	12.2%	0	0	0	9,065	260	2.9%	
2003	6,978	8,270	9,329	9,287	12.3%	0	0	0	9,287	40	0.4%	
2004	7,184	8,490	9,329	9,534	12.3%	0	0	0	9,534	-200	-2.1%	
2005	7,367	8,700	9,312	9,770	12.3%	0	0	0	9,770	-460	-4.7%	
2006	7,543	8,910	9,312	10,006	12.3%	0	0	0	10,006	-690	-6.9%	
2007	7,744	9,130	9,312	10,253	12.3%	0	0	0	10,253	-940	-9.2%	
2008	7,939	9,350	9,312	10,500	12.3%	0	0	0	10,500	-1,190	-11.3%	
2009	8,160	9,590	9,312	10,769	12.3%	0	0	0	10,769	-1,460	-13.6%	
2010	8,374	9,820	9,312	11,027	12.3%	0	0	0	11,027	-1,720	-15.6%	
2011	8,579	10,060	9,312	11,297	12.3%	0	0	0	11,297	-1,980	-17.5%	
2012	8,812	10,300	9,312	11,566	12.3%	0	0	0	11,566	-2,250	-19.5%	
2013	8,912	10,410	9,312	11,690	12.3%	0	0	0	11,690	-2,380	-20.4%	

Notes:

- (1) Peaks include expected transactions with Luzerne Electric and other FERC customers. The peak load data is for PL System, not PL Group.
- (2) This column reflects the net effect of Capacity and Energy arrangements with AE, BG&E, and JCP&L and includes the additional resources (NUG output and Interruptible Load) as shown on page 2 of this table.
- (3) PP&L's allocated share of PJM's installed capacity obligation as determined in the PJM Agreement. The estimated forecast obligation shown was determined using installed capacity obligation for PL Group (PL & LU). This obligation is customarily presented in terms of summer rated capacity. The "Winter" obligation is an equivalent value adjusted by the difference between PL Summer and Winter installed capacity. 1994 and 1995 are estimated based on the latest after-the-fact obligation calculation. The obligations for 1996-2003 are based on the PJM Load and Capacity Forecast and the Allocation of Forecast Requirements dated July 14, 1994. Obligations for years 2004-2013 are calculated assuming a 12.3% reserve over winter peak (same as 2003)
- (4) PP&L's additional obligations are those resulting from capacity credit sales arising from two party agreements. The GPU and PEPCO sales are firm.
- (5) PP&L's Total Obligation is the sum of its PJM Obligation and Capacity Credit Sales.
- (6) Net Resources over Total Obligations is PP&L's Net Resources in excess of PP&L's Total Obligations.
- (7) The net resources shown for 1994 and 1995 are based on a PJM obligation calculated on an after-the-fact accounting method which uses the latest PP&L peak load and unit performance forecasts.

TABLE 3-3 (Continued)
PP&L's Resources / Obligations Summary
 1994 LCP HI LOADS
 Further Details and Background data
 (Megawatts)

Planning Period	(1) Existing Capacity	(2) Capacity Additions & Retates	(3) Capacity Retirements & Derates	(4) Utility Purch./Sales			(5) NUGs	(6) Net Installed Including NUG	(7) Demand-Side Resources		(8) Net Resources	Reserve as Percent of Winter Peak
				AE	BG&E	JCP&L			IL	IL (Used as a Resource)		
1994	8,498	46	0	-129	-129	-946	604	7,844	229	273	8,117	21%
1995	8,543	46	0	-129	-132	-946	604	7,886	229	273	8,159	19%
1996	8,588	0	0	-129	-132	-766	604	8,076	229	273	8,348	20%
1997	8,588	0	0	-129	-132	-667	604	8,264	229	273	8,537	20%
1998	8,588	0	0	-129	-132	-378	604	8,463	229	273	8,728	19%
1999	8,588	0	-18	-129	-132	-189	604	8,624	229	273	8,897	19%
2000	8,570	0	-18	-129	-132	0	604	8,795	229	273	9,068	18%
2001	8,552	0	0	0	0	0	604	9,056	229	273	9,329	18%
2002	8,552	0	0	0	0	0	604	9,056	229	273	9,329	16%
2003	8,552	0	0	0	0	0	604	9,056	229	273	9,329	13%
2004	8,552	0	0	0	0	0	604	9,056	229	273	9,329	10%
2005	8,552	0	-17	0	0	0	604	9,039	229	273	9,312	7%
2006	8,535	0	0	0	0	0	604	9,039	229	273	9,312	6%
2007	8,535	0	0	0	0	0	604	9,039	229	273	9,312	2%
2008	8,535	0	0	0	0	0	604	9,039	229	273	9,312	0%
2009	8,535	0	0	0	0	0	604	9,039	229	273	9,312	-3%
2010	8,535	0	0	0	0	0	604	9,039	229	273	9,312	-6%
2011	8,535	0	0	0	0	0	604	9,039	229	273	9,312	-7%
2012	8,535	0	0	0	0	0	604	9,039	229	273	9,312	-10%
2013	8,535	0	0	0	0	0	604	9,039	229	273	9,312	-11%

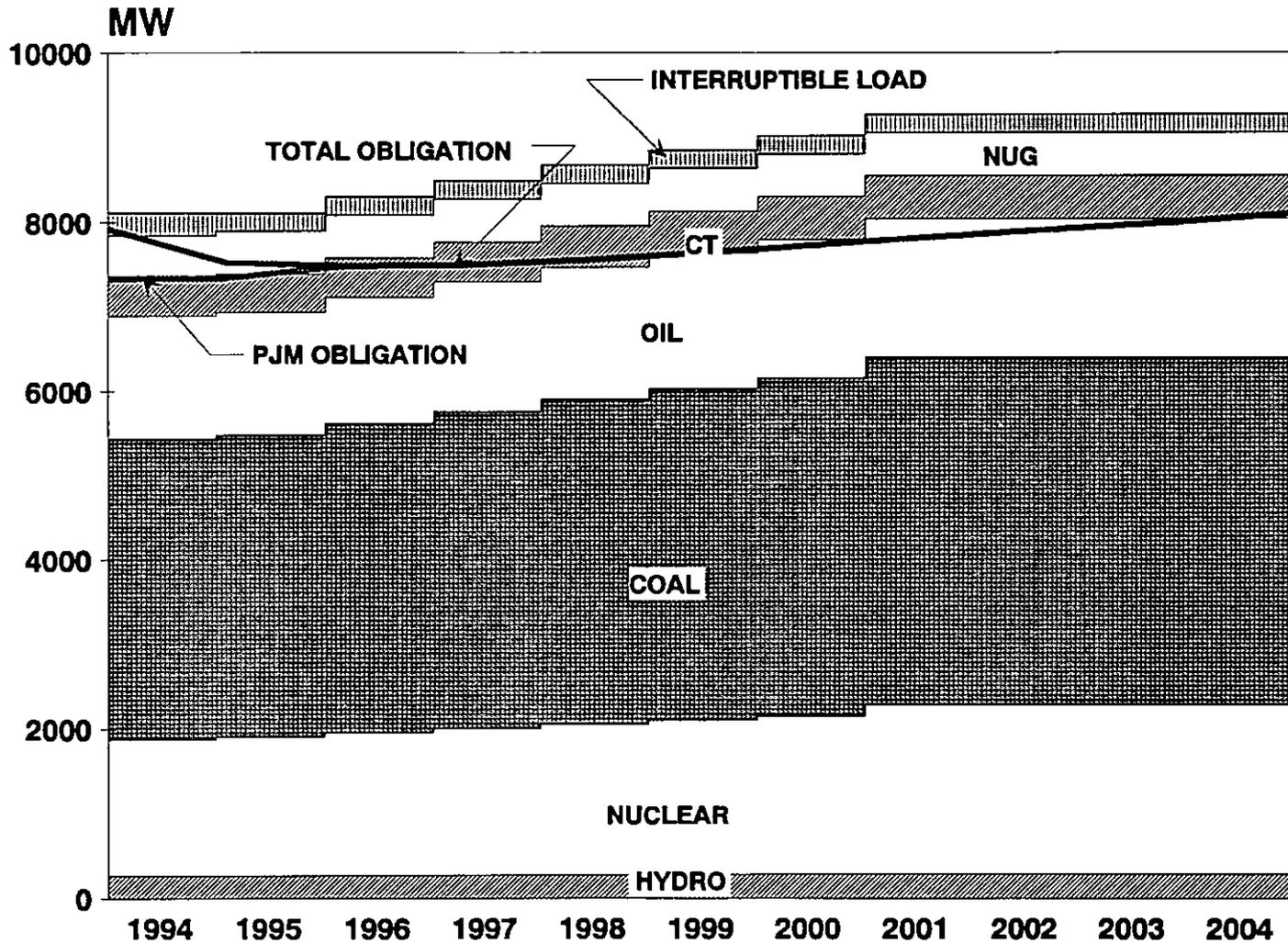
Notes:

- (1) PP&L's total existing capacity shown reflects the winter ratings of all units.
- (2) Capacity additions/unit retates reflect the following:
PP&L's share of the SSES uprates : Unit 2, 45MW (8/94) and Unit 1, 45MW (8/95).
- (3) Capacity retirements/unit derates reflect the following: Estimated net capacity reduction resulting from the installation of scrubbers to comply with the Clean Air Act.
1999 - Montour Unit 1 (18MW)
2000 - Montour Unit 2 (18MW)
2006 - Brunner Island Unit 3 (17MW)
- (4) The Purchases/Sales indicated reflect the Capacity and Energy arrangements with AE, BG&E and JCP&L.
-- Atlantic Electric (AE): Agreement with AE for 129 MW (winter rating) PL coal fired generation 10/1/91 thru 9/30/00
-- Baltimore Gas & Electric (BG&E): Agreement with BG&E for the sale of capacity and energy associated with 5.84 % of SSES 10/1/91 thru 5/31/01.
-- Jersey Central Power & Light (JCP&L): Agreement with JCP&L to purchase a 946 MW slice of System Capacity and Energy thru 12/95.
After 1995 the sale decreases uniformly (20%/yr) until expiration 12/31/99.
- (5) 604 MW of NUG on PP&L's system is claimed as capacity as of 6/1/92.
- (6) Net Installed Including NUG is the measure of PP&L's total supply-side resources available to meet the energy needs of its customers.
- (7) Demand-Side Resources available to PP&L which can be used to enhance system reliability and PP&L's resource mix.
- (8) Net Resources are the sum of PP&L's Net Installed Capacity Including NUG and Interruptible Load Credit.

PP&L RESOURCES / OBLIGATIONS

1994 LOW LOADS

CHART 3-3



3-23

TOTAL OBLIGATION INCLUDES CAPACITY CREDIT SALES AND PJM OBLIGATION

**TABLE 3-4
PP&L's Resources / Obligations Summary**

1994 LCP LOW LOADS

PJM Reserve Requirement – 22.0% (1994), 21.5% (1995), 21% (1996), 20.5% (1997), 20% (1998-2013)

Planning Period	(1) Peaks (MW) Summer Winter		(2) Net Resources (MW)	PP&L Obligations					(5) Total Obligation (MW)	(6) Net Resources over Total Obligation MW %	
				To PJM (3)		Capacity Credits (MW) (4)					
				Estimated Obligation (MW)	% Over Winter Peak	BG&E (Est.)	PEPCO	GPU			
1994	5,437	6,500	8,117	7,329	12.8%	50	147	390	7,916	200	(7) 2.5%
1995	5,514	6,580	8,159	7,341	11.6%	183	0	0	7,524	630	(7) 8.4%
1996	5,562	6,590	8,348	7,486	13.6%	0	0	0	7,486	860	11.5%
1997	5,588	6,660	8,537	7,493	12.5%	0	0	0	7,493	1,040	13.9%
1998	5,658	6,730	8,726	7,552	12.2%	0	0	0	7,552	1,170	15.5%
1999	5,714	6,810	8,897	7,635	12.1%	0	0	0	7,635	1,260	16.5%
2000	5,792	6,890	9,068	7,733	12.2%	0	0	0	7,733	1,340	17.3%
2001	5,870	6,960	9,329	7,817	12.3%	0	0	0	7,817	1,510	19.3%
2002	5,934	7,050	9,329	7,909	12.2%	0	0	0	7,909	1,420	18.0%
2003	6,007	7,120	9,329	7,995	12.3%	0	0	0	7,995	1,330	16.6%
2004	6,101	7,210	9,329	8,097	12.3%	0	0	0	8,097	1,230	15.2%
2005	6,173	7,290	9,312	8,186	12.3%	0	0	0	8,186	1,130	13.8%
2006	6,240	7,370	9,312	8,276	12.3%	0	0	0	8,276	1,040	12.6%
2007	6,319	7,450	9,312	8,366	12.3%	0	0	0	8,366	950	11.4%
2008	6,393	7,530	9,312	8,456	12.3%	0	0	0	8,456	860	10.2%
2009	6,484	7,620	9,312	8,557	12.3%	0	0	0	8,557	760	8.9%
2010	6,566	7,700	9,312	8,647	12.3%	0	0	0	8,647	670	7.7%
2011	6,635	7,780	9,312	8,737	12.3%	0	0	0	8,737	580	6.6%
2012	6,724	7,860	9,312	8,826	12.3%	0	0	0	8,826	490	5.6%
2013	6,806	7,950	9,312	8,928	12.3%	0	0	0	8,928	380	4.3%

Notes:

- (1) Peaks include expected transactions with Luzerne Electric and other FERC customers. The peak load data is for PL System, not PL Group.
- (2) This column reflects the net effect of Capacity and Energy arrangements with AE, BG&E, and JCP&L and includes the additional resources (NUG output and interruptible load) as shown on page 2 of this table.
- (3) PP&L's allocated share of PJM's installed capacity obligation as determined in the PJM Agreement. The estimated forecast obligation shown was determined using installed capacity obligation for PL Group (PL & LU). This obligation is customarily presented in terms of summer rated capacity. The "Winter" obligation is an equivalent value adjusted by the difference between PL Summer and Winter installed capacity. 1994 and 1995 are estimated based on the latest after-the-fact obligation calculation. The obligations for 1996-2003 are based on the PJM Load and Capacity Forecast and the Allocation of Forecast Requirements dated July 14, 1994. Obligations for years 2004-2013 are calculated assuming a 12.3% reserve over winter peak (same as 2003)
- (4) PP&L's additional obligations are those resulting from capacity credit sales arising from two party agreements. The GPU and PEPCO sales are firm.
- (5) PP&L's Total Obligation is the sum of its PJM Obligation and Capacity Credit Sales.
- (6) Net Resources over Total Obligations is PP&L's Net Resources in excess of PP&L's Total Obligations.
- (7) The net resources shown for 1994 and 1995 are based on a PJM obligation calculated on an after-the-fact accounting method which uses the latest PP&L peak load and unit performance forecasts.

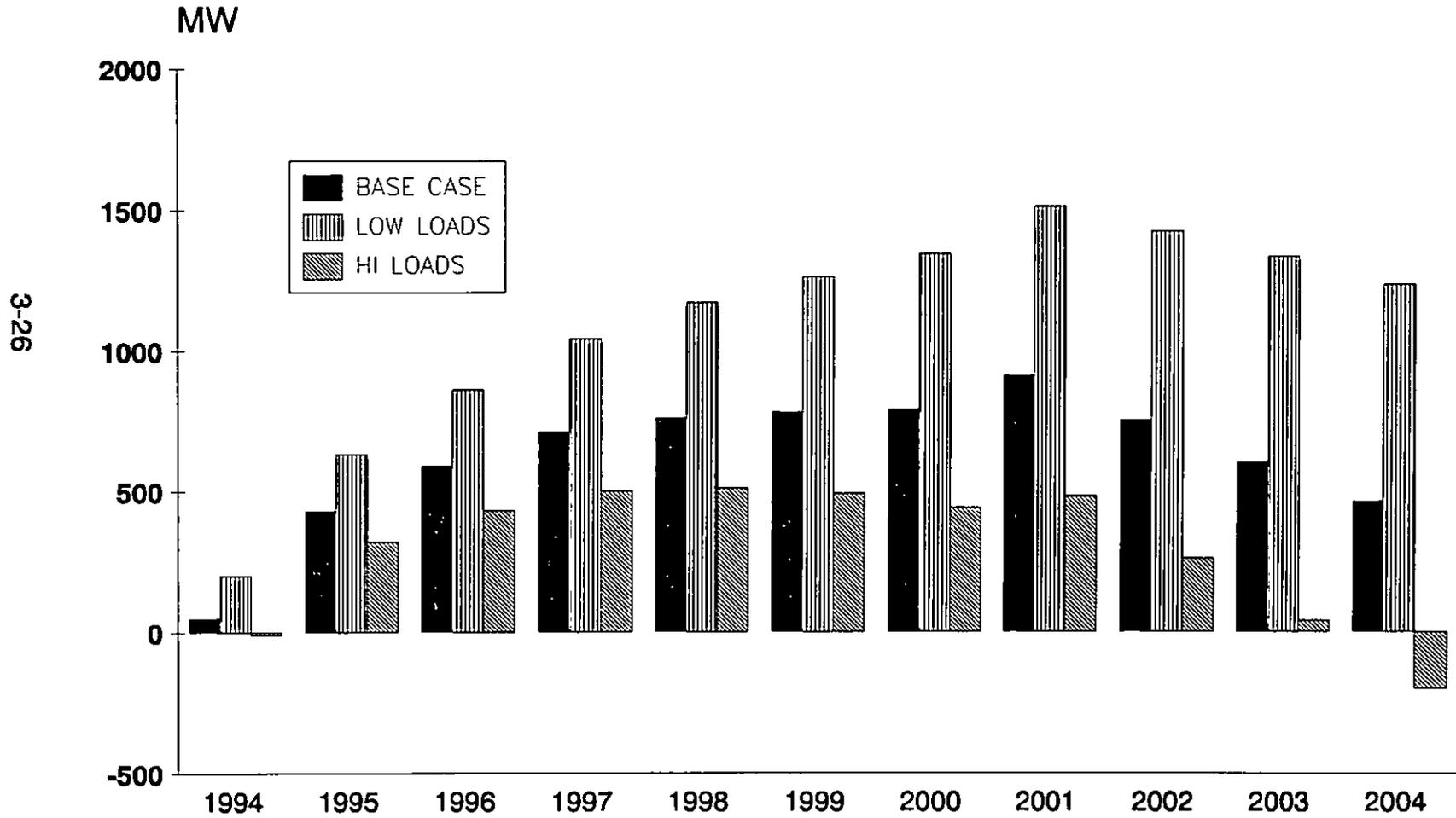
TABLE 3-4 (Continued)
PP&L's Resources / Obligations Summary
 1994 LCP LOW LOADS
 Further Details and Background data
 (Megawatts)

Planning Period	(1) Existing Capacity	(2) Capacity Additions & Rerates	(3) Capacity Retirements & Derates	(4) Utility Purch./Sales			(5) NUGs	(6) Net Installed Including NUG	(7) Demand-Side Resources		(8) Net Resources	Reserve as Percent of Winter Peak
				AE	BG&E	JCP&L			I L	I L (Used as a Resource)		
1994	8,498	46	0	-129	-129	-946	604	7,844	229	273	8,117	26%
1995	8,543	46	0	-129	-132	-946	604	7,888	229	273	8,169	24%
1996	8,588	0	0	-129	-132	-766	604	8,076	229	273	8,348	27%
1997	8,588	0	0	-129	-132	-667	604	8,264	229	273	8,537	28%
1998	8,588	0	0	-129	-132	-378	604	8,463	229	273	8,728	30%
1999	8,588	0	-18	-129	-132	-189	604	8,624	229	273	8,897	31%
2000	8,570	0	-18	-129	-132	0	604	8,795	229	273	9,068	32%
2001	8,552	0	0	0	0	0	604	9,058	229	273	9,329	34%
2002	8,552	0	0	0	0	0	604	9,058	229	273	9,329	32%
2003	8,552	0	0	0	0	0	604	9,058	229	273	9,329	31%
2004	8,552	0	0	0	0	0	604	9,058	229	273	9,329	29%
2005	8,552	0	-17	0	0	0	604	9,039	229	273	9,312	28%
2006	8,535	0	0	0	0	0	604	9,039	229	273	9,312	26%
2007	8,535	0	0	0	0	0	604	9,039	229	273	9,312	25%
2008	8,535	0	0	0	0	0	604	9,039	229	273	9,312	24%
2009	8,535	0	0	0	0	0	604	9,039	229	273	9,312	22%
2010	8,535	0	0	0	0	0	604	9,039	229	273	9,312	21%
2011	8,535	0	0	0	0	0	604	9,039	229	273	9,312	20%
2012	8,535	0	0	0	0	0	604	9,039	229	273	9,312	18%
2013	8,535	0	0	0	0	0	604	9,039	229	273	9,312	17%

Notes:

- (1) PP&L's total existing capacity shown reflects the winter ratings of all units.
- (2) Capacity additions/unit rerates reflect the following:
 PP&L's share of the SSES uprates : Unit 2, 45MW (8/94) and Unit 1, 45MW (8/95).
- (3) Capacity retirements/unit derates reflect the following: Estimated net capacity reduction resulting from the installation of scrubbers to comply with the Clean Air Act.
 1999 - Montour Unit 1 (18MW)
 2000 - Montour Unit 2 (18MW)
 2006 - Brunner Island Unit 3 (17MW)
- (4) The Purchases/Sales indicated reflect the Capacity and Energy arrangements with AE, BG&E and JCP&L.
 - Atlantic Electric (AE): Agreement with AE for 129 MW (winter rating) PL coal fired generation 10/1/91 thru 9/30/00
 - Baltimore Gas & Electric (BG&E): Agreement with BG&E for the sale of capacity and energy associated with 5.94 % of SSES 10/1/91 thru 5/31/01.
 - Jersey Central Power & Light (JCP&L): Agreement with JCP&L to purchase a 945 MW slice of System Capacity and Energy thru 12/95.
 After 1995 the sale decreases uniformly (20%/yr) until expiration 12/31/99.
- (5) 604 MW of NUG on PP&L's system is claimed as capacity as of 6/1/92.
- (6) Net Installed Including NUG is the measure of PP&L's total supply-side resources available to meet the energy needs of its customers.
- (7) Demand-Side Resources available to PP&L which can be used to enhance system reliability and PP&L's resource mix.
- (8) Net Resources are the sum of PP&L's Net Installed Capacity Including NUG and Interruptible Load Credit.

PP&L NET RESOURCES OVER OBLIGATIONS



CHAPTER 4

EXISTING GENERATION - NUCLEAR

CHAPTER 4
BUDGET DISCUSSION - EXISTING GENERATION-NUCLEAR

This chapter includes a discussion of the capital projects identified for Susquehanna SES during the 1995-1999 five-year period. All of the estimated costs discussed in this chapter reflect PP&L 90% share of Susquehanna, and are in escalated dollars.

A. General Discussion

Estimated expenditures for 1995 are \$49.5 million and for the five-year period 1995-1999, \$213.8 million. These estimates reflect a detailed review of work anticipated in 1995 and the ongoing portion of these projects that extends into future years. Expenditure levels beyond 1995 represent continuation of existing projects and emergent work. This capital budget includes allowances within individual projects to provide a level of assurance that the amount budgeted will not be exceeded for constant scope. Scope growth or emergent work will be funded from a reserve for that purpose. A breakdown of the estimated costs for the five-year period 1995-1999 is shown in Table 4-1. Since 1993, Capital requirements for Susquehanna have been on a downward trend. This trend is expected to continue, even as industry experience indicates that we should expect to replace some obsolete equipment in this timeframe. In addition, strategic planning initiatives are nearing completion which are anticipated to further reduce capital requirements.

The capital costs at Susquehanna are budgeted for individual project-related work and capital "pools" of smaller, routine expenditures which are not specifically identified project by project. The project-related work is divided, for information purposes, into Major Projects or Minor Replacements. The project-related work generally has defined starting and finishing dates to complete a predetermined scope of work at an approved:

TABLE 4-1
 BREAKDOWN OF EXISTING GENERATION NUCLEAR PROJECTS
 FIVE YEAR EXPENDITURES
 BY CATEGORY
 \$ MILLIONS - ESCALATED

	# of Projects	1995	1996	1997	1998	1999	Total 1995-1999	% of \$
<u>Major Projects</u>								
Regulatory/Nuclear Safety	12	3.1	7.4	3.9	0.2		14.6	7
Minor Replacements	22	18.5	20.0	10.3	1.4		50.2	23
Economic/Performance Improvements	20	17.5	0.8	0.4	0.3		19.0	9
Work Conditions/Safety Improvements	5	0.6	0.9	0.9			2.4	1
Subtotal	59	39.7	29.1	15.5	1.9	0.0	86.2	40
<u>Minor Replacements</u>								
Minor Work Projects - Capital		0.9	0.9	1.0	1.0	1.0	4.8	2
Maintenance - Capital Replacements		0.3	0.9	0.9	1.0	1.0	4.1	2
Site Services - Capital		0.8	0.5	0.5	0.5	0.5	2.8	1
Subtotal		2.0	2.3	2.4	2.5	2.5	11.7	5
<u>Capital Pools</u>								
Capital Furniture		0.4	0.1	0.1	0.1	0.1	0.8	0
Capital Equipment		0.4	0.4	0.4	0.4	0.4	2.0	1
Capital Spare Parts		1.5	1.4	1.4	1.4	1.5	7.2	3
Capital Tools		0.8	0.9	1.0	1.0	1.0	4.7	2
Pooled Inventory Management		0.1	0.2	0.2	0.2	0.2	0.9	0
Subtotal		3.2	3.0	3.1	3.1	3.2	15.6	6
<u>Other</u>								
Uncommitted		4.6	10.6	21.8	33.0	30.3	100.3	49
TOTAL		49.5	45.0	42.8	40.5	36.0	213.8	100

TABLE 4-2
EXISTING GENERATION NUCLEAR MAJOR PROJECTS
FIVE-YEAR BUDGET PLAN
\$ MILLIONS - ESCALATED

	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>Total 1995-1999</u>
Regulatory/Nuclear Safety						
Spent Fuel Storage Additions	0.6	6.0	3.3	0.2		10.1
Reactor Core Stability - Unit 1	0.2	0.6	0.3			1.1
Reactor Core Stability - Unit 2	0.2	0.6	0.3			1.1
Reactor Water Level Instrument - Unit 1	0.4	0.2				0.6
Reactor Water Level Instrument - Unit 2	0.4					0.4
Plant Physical Protection	0.5					0.5
SUBTOTAL	2.3	7.4	3.9	0.2	0.0	13.8
Replacements						
Reactor Recirculation Pump Shaft - Unit 1	0.5	5.1	0.5			6.1
Reactor Recirculation Pump Shaft - Unit 2	2.3	2.2	1.5			6.0
Plant Computer Upgrade - Unit 1	1.9	4.7	0.7			7.3
Plant Computer Upgrade - Unit 2	4.6	1.6	0.7			6.9
Plant Computer - Common	0.4	0.2	0.1			0.7
Erosion/Corrosion Piping - Unit 1	1.3	1.1	1.0			3.4
Erosion/Corrosion Piping - Unit 2	1.7	0.7	1.0			3.4
Condenser Tube Cleaning - Unit 1	0.8	0.1				0.9
Condenser Tube Cleaning - Unit 2	1.1	0.1				1.2
Control Rod Blade Rep - Unit 1	0.2	0.9	0.2	0.2		1.5
Control Rod Blade Rep - Unit 2	0.7	0.3	0.2			1.2
SUBTOTAL	15.5	17.0	5.9	0.2	0.0	38.6
Economic/Performance Improvements						
Power Uprate Base - Unit 1	3.2					3.2
Power Uprate Mods - Unit 1	1.8					1.8
Refuel Platform Upgrade - Unit 1	1.2					1.2
Refuel Platform Upgrade - Unit 2	1.2					1.2
Condenser Demin Heel Removal - Unit 1	1.2					1.2
Condenser Demin Heel Removal - Unit 2	1.2					1.2
Digital Feedwater Control - Unit 1	1.1					1.1
Digital Feedwater Control - Unit 2	1.1					1.1
SUBTOTAL	12.0	0.0	0.0	0.0	0.0	12.0
Working Conditions/Safety Improvements						
Fire Protection Upgrades - Unit 1	0.2					0.2
Fire Protection Upgrades - Unit 2	0.2					0.2
Fire Protection Upgrades - Common	0.2					0.2
SUBTOTAL	0.6	0.0	0.0	0.0	0.0	0.6
TOTAL	30.4	24.4	9.8	0.4	0.0	65.0

cost. Capital Pools are routine items required at the power plant that are large enough that their costs can be capitalized. Their expenditure levels are determined by assessing past patterns and projecting future expectations.

B. Major Projects

Major projects are significant investments made by the Nuclear Department toward maintaining or improving Plant operations. Each of the Major Projects selected for implementation satisfies one or more of the Department's Five-Year Objectives, which are established to measure our long-term commitment to achieving excellence in operation, maintenance, and support of Susquehanna.

For budget analysis purposes, the Major Projects are categorized into four basic types of work:

1. Regulatory/Nuclear-Safety related projects
2. Replacements
3. Economic/Performance Improvements
4. Work Conditions/Safety Improvements

A brief explanation of each category and the supporting approved projects will be discussed below:

1. Regulatory/Nuclear-Safety Related Projects

Most projects in this category are to maintain compliance with the requirements of the various regulatory and environmental agencies. In the realm of maintaining nuclear safety, we must consider not only compliance, but also risk reduction, earning the trust of the public, and avoiding the

potential of regulatory intervention. Hence, all of the capital costs in this category, while not necessarily imposed, are considered to be among the highest priority.

The identified costs for the next five years are \$14.6 million with \$14.4 million established in the first three years. As additional needs are identified, they will be funded from the "Uncommitted" allocation.

For 1995, there are 12 projects identified, amounting to \$3.1 million, with the key ones listed as follows:

Reactor Water Level Instrumentation	\$0.8 million
Spent Fuel Storage Additions	\$0.6 million
Plant Physical Protection	\$0.5 million
<i>Reactor Core Stability</i>	<i>\$0.4 million</i>

2. Replacements

Replacements are projects which maintain unit performance by replacing deteriorated or obsolete equipment or components with functionally similar items. Such replacements are necessary to avoid the loss of function from the failure of the equipment, which could result in partial or complete load reduction, efficiency loss, and/or unsafe conditions.

The identified costs for the next five years are \$50.2 million with \$48.8 million established in the first three years. As additional needs are identified due to the aging factor of the Plant, they will be funded from the "Uncommitted" allocation.

For 1995, there are 22 projects, amounting to \$18.5 million, in this category.

The major ones are listed as follows:

Plant Computer Upgrade	\$6.9 million
Erosion/Corrosion Piping Replacement	\$3.0 million
Reactor Recirc Pump Shaft Replacement	\$2.8 million
Condenser Tube Cleaning	\$1.9 million

Over the next five years, the Plant Computer Upgrade and Reactor Recirculating Pump Shaft Replacements are two major projects of enormous proportions:

The Plant Computer System is needed for reliable operation of the Susquehanna power plant. It is unlikely that the regulator would allow the Plant to operate for extended periods of time without a functioning computer. The current system will be at the end of its expected life by 1996. When the reliability degrades, there will be significant increases in cost of repairs, and replacement parts will be difficult to obtain. By replacing the existing computer with a new modern system, we will enhance our ability to monitor the conditions in the Plant, and the computer system will be cheaper to maintain.

Industry experience indicates that the Recirculating Pump Shafts at Susquehanna will crack over time. The pump manufacturer and vendor both recommend performing crack inspections, and preparing for a shaft changeout should significant cracks be discovered. To avoid the potential of catastrophic failure, which will result in significant lost generation, it is prudent to install the new shaft, rather than reinstall the old shaft, while the recirculating pump is disassembled for inspection. A total of \$12.1 million is

included for the five-year period to procure and replace both pump shafts in both units, as required.

3. Economic/Performance Improvements

Projects in this category are the ones that can improve generating plant availability, capacity and efficiency. They should also help maintain and reduce operating costs in the long run. These projects usually entail the enhancement of overall system performance, resulting in improved cost-effectiveness.

Currently, the identified costs for the next five years are \$19.0 million. We estimate the capital costs for the 1995-1999 period in this category to curtail significantly. Any additional needs will be funded from the "Uncommitted" allocation.

For 1995, there are 20 projects in this category. The major ones, which will all be completed in 1995, are listed as follows:

Power Uprate - Base	\$3.2 million
Refuel Platform Upgrade	\$2.4 million
Condensate Demineralizer Heel Removal	\$2.4 million
Digital Feedwater Control	\$2.2 million

4. Work Conditions/Safety Improvements

Projects in this category are the ones that can improve working conditions and industrial safety. They are designed to alleviate unusual hazards to personal safety, health and welfare. They are aimed to improve the human factors of all workers and personnel.

The identified costs for the next five years are \$2.4 million. Any new projects will be funded from the "Uncommitted" allocation.

For 1995, there are 5 projects, amounting to \$0.6 million, in this category. The Fire Protection Upgrade Project at \$0.6 million accounts for most of this category.

The five-year budget plan of the larger projects under the above four categories is tabulated in Table 4-2.

C. Minor Replacements

Three separate funds are established to cover various replacements, additions, and property retirements at Susquehanna. They amount to an annual total of about \$2.5 million. The 1995-1999 period will amount to about \$11.7 million. These minor replacements can be categorized into the following:

1. Minor Work Projects
2. Maintenance - Capital Replacements
3. Site Services - Capital

A brief explanation of each category is discussed below:

1. Minor Work Projects

Minor work projects are small projects which are authorized under subordinate ERs and are expected to cost under \$0.09 million each. The 1995 Budget includes \$0.9 million, which continues a downward trend.

2. Maintenance - Capital Replacements

This is comprised of all maintenance activities associated with the replacement of retirement units. The 1995 Budget includes an allowance of \$0.3 million for these replacements.

3. Site Services - Capital

This category includes minor building and grounds improvements which are outside the realm of plant operations. Individual work items in this category of work generally cost less than \$0.09 million each, and are authorized by the Vice President - Nuclear Operations. The 1995 Budget includes \$0.8 million for this item.

D. Capital Pools

Capital Pools contain funding for smaller, routine items that are required to support plant operations. They are funded at about \$3.1 million per year. For the 1995-1999 period, the total amounts to \$15.6 million. The 1995 Budget includes \$3.2 million for these items.

The Capital Pools are classified into the following categories:

1. Capital Spare Parts
2. Capital Tools
3. Capital Equipment
4. Capital Furniture
5. Pooled Inventory Management

A brief explanation of each category is discussed below:

1. Capital Spare Parts

This fund is used to purchase Major Capital Spare Parts with long lead times that would lead to extended outages if the spares were not available. The funding level is based on historical needs along with current forecasts of required spares. The 1995 Budget includes \$1.5 million.

2. Capital Tools

This category includes all large tools to be purchased for use by the workers or craftsmen in operations, maintenance, and installation. The 1995 Budget is \$0.8 million.

3. Capital Equipment

This category consists of all equipment to be purchased for use in operations, maintenance, and installation. The 1995 Budget is \$0.4 million.

4. Capital Furniture

This category includes various kinds of furniture to be purchased for use at Susquehanna, including the Training Center and EOF Building. The 1995 Budget is \$0.4 million.

5. Pooled Inventory Management

PP&L, in partnership with other power companies, is participating in a program designed to share funding for the purchase of high-risk, expensive, long lead-time spare equipment. The intent of this program is to minimize Susquehanna downtime by maintaining a pool, shared by the participants, of

items that could significantly affect the ability to continue power generation by the plant. The 1995 Budget includes \$0.1 million for this category.

E. Uncommitted

The Uncommitted portion of the Budget provides for two types of future needs.

The first type is for potential projects which are identified, but have not been included as specific projects because their timing, scope and costs have not yet been adequately defined. For 1995, there are three projects that fall into this category, namely, Thermolag Acceptance, River Water Make-up Line Replacement, and Security System Upgrade.

The second category is a reserve for emergent projects that have not yet been identified. The Plan Review Team will manage this reserve to ensure that funds are made available when high-priority projects emerge.

The size of the reserve is basically determined by analysis of past needs and the ability to identify them, as well as consideration of future conditions and performance expectations. We estimate the Uncommitted fund for the next five years will amount to about \$100 million. The Regulatory/Nuclear Safety category probably will be maintained at the current average level of \$3 to \$5 million per year due to anticipation of continuing regulatory requirements. The Replacement category will be maintained at the current level of \$18 to \$20 million per year due to the aging factor of the Plant. The two improvement categories, Economic/Performance Improvement and Working Conditions/Safety Improvement are discretionary. We will manage this limited reserves to provide funding for higher priority work.

For 1995, the Uncommitted portion is \$4.6 million.

F. Nuclear Fuel

PP&L has established a trust which allows PP&L to lease its 90% share of nuclear fuel for the Susquehanna units. For 1995, PP&L will be able to lease a maximum of \$200 million worth of fuel from this trust. This cap is in line with the current expectations for fuel cost during the budget year. Under the lease arrangement the nuclear fuel purchased by the Company is sold to the trust and leased back. When the net investment of the lessor exceeds \$200 million, PP&L will then own and finance any additional nuclear fuel purchases. As quarterly lease payments are made to the trust, additional PP&L-owned fuel will be sold to the trust.

Included in the projected fuel purchase are full allowances for additional requirements resulting from the Power Uprate Project, and planned higher capacity factors.

Table 4-3, Column 2, shows nuclear fuel purchases projected for the period 1995 through 2004. Column 3 represents the end-of-year total dollars under the trust agreement. Column 4 contains the PP&L-owned portion of nuclear fuel at year end. Column 5 shows the estimated annual financing requirement which exceeds the limit of the trust agreement. The year-end value of PP&L-owned fuel, Column 4, from 1995 through 1999 is zero. Therefore, no additional financing is required in this period.

TABLE 4-3
 PROJECTED NUCLEAR FUEL PURCHASES
 90% OWNERSHIP SHARE
 \$ MILLIONS - ESCALATED

<u>Year</u>	<u>Fuel Purchases</u>	<u>Under Lease @ Year End</u>	<u>PP&L Owned @ Year End</u>	<u>Required Financing</u>
1994	—	147.1	0.0	—
1995	52.1	138.4	0.0	0.0
1996	77.2	153.9	0.0	0.0
1997	47.2	141.1	0.0	0.0
1998	61.5	147.5	0.0	0.0
1999	88.7	172.3	0.0	0.0
2000	49.2	154.8	0.0	0.0
2001	65.0	159.2	0.0	0.0
2002	91.5	181.4	0.0	0.0
2003	54.4	164.5	0.0	0.0
2004	71.9	171.7	0.0	0.0

CHAPTER 5

EXISTING GENERATION - FOSSIL AND HYDRO

CHAPTER 5
BUDGET DISCUSSION-EXISTING GENERATION - FOSSIL AND HYDRO

A. GENERAL DISCUSSION

Projects at existing Fossil and Hydro generating plants are classified as three basic types of work: 1) regulatory projects, most of which are related to maintaining environmental compliance, 2) equipment replacements to continue the operation of plants, and 3) improvement projects. Because of their significant magnitude, expenditures to comply with the 1990 Clean Air Act Amendments are categorized separately. Also, improvement projects are further categorized as projects to improve economic performance and projects to improve working conditions. A breakdown of existing generation costs by category for the five-year period 1995-1999 is shown in Table 5-1. A summary of large projects follows in Table 5-2.

Estimated expenditures for 1995 are \$105.1 million and for the five-year period 1995-1999 are \$768.0 million. The 1994-1998 Construction Program estimated 1995 expenditures to be \$116.9 million and 1995-1999 expenditures to be \$834.6 million. The reduction in estimated expenditures is largely due to the efforts of the Market Clearing Price of Generation plant teams to identify opportunities to avoid or defer capital projects. Consistent with the strategies discussed in Chapter 1, projects are scheduled within the five-year period based on consideration of the consequences of deferral, timing of outages, and the need for coordination among projects and outages with the following exceptions:

1. Projects to IMPROVE AVAILABILITY and REDUCE OPERATING AND MAINTENANCE costs which do not recover capital and capital-related costs within five years are deferred beyond the five-year period.
2. BUILDINGS projects at power plants are scheduled on the basis of senior management's review of all corporate buildings projects.

TABLE 5-1
 BREAKDOWN OF EXISTING GENERATION PROJECTS
 BY CATEGORY
 \$ MILLIONS - ESCALATED

	# of Projects	1995	1996	1997	1998	1999	Total 1995-1999	% of \$
Regulatory/Environmental	27	24.5	47.1	5.8	6.7	4.2	88.3	15
Replacements	35	43.1	10.3	5.3			58.7	10
Improvements								
Economic Improvements	4	1.1	15.4	11.5			28.0	5
Working Conditions/Safety Improvements	7	0.8	0.8	0.7	0.1	0.1	2.5	0
Subtotal	73	69.5	73.6	23.3	6.8	4.3	177.5	30
Clean Air Act Compliance	6	14.1	14.2	148.0	193.9	43.5	413.7	69
Keystone & Conemaugh Clean Air Act	2	5.8					5.8	1
Subtotal -- Clean Air Act	8	19.9	14.2	148.0	193.9	43.5	419.5	70
Subtotal	81	89.4	87.8	171.3	200.7	47.8	597.0	100
Asbestos Abatement Program		1.4	2.1	1.7			5.2	
Keystone & Conemaugh		6.4	6.6	6.8	7.0	7.2	34.0	
Unanticipated Replacements		1.0	1.0	1.1	1.1	1.1	5.3	
Minor Replacements		1.5	1.5	1.6	1.6	1.7	7.9	
Minor Additions		0.7	0.7	0.7	0.8	0.8	3.7	
Subtotal		100.4	99.7	183.2	211.2	58.6	653.1	
Uncommitted		4.7	16.9	31.3	29.9	32.1	114.9	
TOTAL		105.1	116.6	214.5	241.1	90.7	768.0	

TABLE 5-2
EXISTING GENERATION LARGE PROJECTS
ANNUAL EXPENDITURES GREATER THAN \$2 MILLION
\$ MILLIONS - ESCALATED

	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	Total <u>1995-1999</u>	Project <u>Total</u>
Martins Creek							
Units #3&4 - Gas-Oil Co-Firing	0.7	15.4	11.5			27.6	28.0
Sunbury							
Unit #1 - Turbine Rehabilitation	3.9					3.9	12.4
Unit #1 - Boiler Rehabilitation	5.4		0.1			5.5	7.2
Unit #4 - Generator Rotor	0.2	2.5	0.5			3.2	3.3
Dry Fly Ash	1.2	14.9	1.4			17.5	18.1
Bottom Ash Handling	0.2	3.3	0.2			3.7	4.0
Waste Water Treatment	0.5	7.3				7.8	8.0
Clean Air Act	3.5					3.5	7.0
Brunner Island							
Coal Pile Liner	0.2	2.8				3.0	3.4
Unit #2 - Boiler Backpass	0.2	2.8				3.0	3.4
Dry Fly Ash	9.0					9.0	26.1
Montour							
Units #1&2 - Controls	6.4	4.9				11.3	12.9
Unit #1 - Feedwater Heaters	3.1					3.1	3.4
Clean Air Act	10.6	14.2	147.8	193.4	41.3	407.3	429.3
Holtwood							
Fish Passage	6.8	12.3				19.1	20.8
Conemaugh							
Clean Air Act	2.6					2.6	9.4
TOTAL	54.5	80.4	161.5	193.4	41.3	531.1	596.7
TOTAL EXISTING GENERATION (COMMITTED)	105.1	116.6	214.5	241.1	90.7	768.0	

Furthermore, each individual project is fully analyzed prior to final approval to verify its contribution to cash flow and consistency with corporate strategies. This is particularly true of projects at the smaller and less economically competitive plants.

B. ENVIRONMENTAL EXPENDITURES (Other Than Clean Air Act)

Most projects in this category during the 1995-1999 period are to maintain compliance with existing regulations. A major exception is the conversion to dry fly ash disposal at Brunner Island, Sunbury and Holtwood. A combination of new stricter regulations and lack of available disposal areas makes dry conversion the least cost alternative for ash disposal. The conversion to dry ash handling at Brunner Island, Sunbury and Holtwood is budgeted for \$45 million of which \$28 million is in the 5-Year period. Total environmental expenditures for 1995-1999, other than those for the Clean Air Act, are \$88 million.

C. CLEAN AIR ACT COMPLIANCE

The 1995-1999 Construction Program includes costs to comply with the ozone non-attainment provision (Title I) and the acid rain provision (Title IV) of the 1990 Clean Air Act Amendments. The ambient ozone non-attainment provision of Title I requires the installation of Reasonably Available Control Technology (RACT) for NO_x emissions from all PP&L fossil-fueled boilers by May 31, 1995 as part of the initial steps toward solving an ozone non-attainment problem which pervades the Northeast. PP&L is installing low NO_x burners where such installations are technically and economically feasible to comply with Pennsylvania's definition of RACT. The need for additional controls beyond RACT is discussed in the chapter titled "Potential Capital Expenditures Not Included in the Base Capital Plan" (Chapter 11).

Title IV also addresses NO_x as well as SO₂ and has two phases of compliance. PP&L's Phase I compliance plan is to burn lower sulfur coal at the seven affected units by the compliance date of January 1, 1995. The low NO_x burners being installed as RACT also address the Title IV NO_x requirements. Compliance with Phase II, which takes effect January 1, 2000, anticipates scrubbers on Montour Units 1 and 2 around the year 2000 and, between 2003 and 2005, Brunner Island Unit 3. Other options actively being considered for SO₂ compliance are lower sulfur fuel and the purchase of SO₂ emission allowances. EPA is required to define Phase II NO_x requirements in 1997.

The total capital cost of compliance with the Clean Air Act is projected to be \$590 million. If required, a scrubber at Brunner 3 would cost an additional \$220 million. Potential capital expenditures for additional Title I NO_x controls and for air toxics controls under Title III are discussed in Chapter 11.

Compliance costs associated with the jointly owned Keystone and Conemaugh Stations are discussed in Section F of this chapter.

D. REPLACEMENTS

Projects which maintain unit performance by replacing deteriorated or obsolete equipment with functionally similar equipment are termed "replacements."

A major effort during the 1995-1999 period is replacing combustion controls on Montour 1 & 2, and replacing turbine controls on Martins Creek 3 & 4. These control systems are obsolete and have deteriorated to where there is concern for the safe and reliable operation of this equipment. Combustion controls will become even more critical with the installation of low NO_x burners. A total of \$12 million is included in the

five-year period for this work. Another significant project, the replacement of boiler components on Brunner Island 2, totals \$15 million in the 5-year period.

E. IMPROVEMENTS

Projects to maintain and improve generating plant availability, capacity and efficiency, and maintain and reduce operating costs are developed from a review of each power plant. This review reflects: 1) analyses of problems at the plants that have caused outages and inefficiencies in the past; 2) analyses which indicate the likelihood of losses in the future; and 3) information concerning other utilities' experience as reported by manufacturers and at industry meetings. About \$31 million during the five-year period is currently committed to 11 performance improvements, currently scheduled during 1995-1999.

The largest project in this category is the conversion of Martins Creek 3 & 4 to gas/oil co-firing (also discussed in Chapter 3). Natural gas is available outside the winter heating season at a lower cost than #6 fuel oil. Being able to carry up to 50% of the capability of these units with gas will result in substantial substantial savings in fuel costs when gas is available and economically priced. The conversion accounts for \$27.6 million of planned expenditures during the five-year period.

Another type of improvement project is related to improved working conditions and safety. During the 1995-1999 period, \$2.5 million is committed for 7 specific working conditions and safety projects at existing generating stations. Also, procedures for dealing with the large amounts of asbestos insulation in existing fossil-fueled power plants are complex and expensive. In order to give visibility to this work, a pool is funded to reflect the level of expenditures currently anticipated. Individual Expenditure Requisitions will be issued for each project.

F. KEYSTONE AND CONEMAUGH

During the 1995-1999 period, \$34.0 million is included to cover PP&L's share of projects identified in the Keystone and Conemaugh capital budgets (Table 5-1). These budgets have been reviewed and approved by the Keystone and Conemaugh Owners Committee. Individual Expenditure Requisitions are issued for each project.

Clean Air Act compliance projects at Keystone and Conemaugh will incur large costs during 1995-1999. Low NO_x burners and scrubbers will be installed at Conemaugh for Phase I. Low NO_x burners will be installed at Keystone as a result of Title I. A total of \$5.8 million is allocated for PP&L's share of these projects during the five-year period. This allocation is in addition to the \$34.0 million noted above for the "normal" plant projects.

G. UNANTICIPATED REPLACEMENTS

This pool is funded to allow large in-kind replacements to be made expeditiously. (An allocation for smaller replacements to be administered by each plant is described in Section H, "Minor Items.") The need for many replacements cannot be identified until inspections are performed during a unit's annual overhaul or until failure actually occurs. The amount allocated reflects historical spending for replacements that could not be anticipated at the start of the budget year.

H. MINOR ITEMS

Two pools are funded to cover various replacements, additions, and property retirements at generating stations which cost \$50,000 or less. Individual Subordinate Expenditure Requisitions are issued for each project. The replacement pool is intended to allow relatively small, in-kind replacements to be made expeditiously. The allocation for this pool is based, in part, on a list of known work. The remainder is based on the amount of unanticipated work of this type which historically arises during

the year. The allocation for minor replacements for 1995 is \$1.5 million with \$7.9 million included in the 1995-1999 period (Table 5-1). The allocation for the additions pool for the budget year is based on a list of anticipated work which is prepared by Power Production and on the funding criteria which have been established for the Capital Construction Budget. The allocation for additions for 1995 is \$0.7 million with \$3.7 million included in the 1995-1999 period (Table 5-1).

I. UNCOMMITTED

The uncommitted portion of the budget provides for two types of future needs. The first is for potential projects which are identified, but have not been included as specific projects in the budget because their timing, scope, or cost have not yet been adequately defined. Most of the funds in uncommitted are allocated for these potential projects. The second need is for projects that are unidentified. The impact of unidentified items on the two-year budget is small in comparison to that of the identified potential projects.

A total of 88 potential projects have been identified and are currently under study with potential capital requirements of \$92 million for the five-year period. These projects are relatively well defined through Budget Item requests, but require a final estimate and evaluation before they can be considered for inclusion in the budget as specific projects. As they are evaluated, many of these projects will prove to be unjustified or be scheduled beyond the five-year period.

A total of \$114.9 million is allocated over the five-year period for potential projects under study which may materialize and for projects which are presently unidentified (Table 5-1).

Tabulated below are some of the major potential projects and their estimated costs for

which funds have been allocated in the five-year period under uncommitted.

	<u>Possible In-Service Date</u>	<u>Estimated Total In-Service Cost</u>
• Martins Creek 3 & 4 Replace LP Turbine Rotors	1997	\$13.0 million
• Montour 2 Replace LP Turbine Rotors	1998	\$11.0 million

While funds have been allocated for these projects and others under uncommitted, no commitments have been made to these projects at this time. Each project must receive an individual go/no go evaluation prior to inclusion in the budget or expenditure of funds.

J. ADJUSTMENT

In the 1994-1995 Construction Budget the total budget amount for projects at existing Fossil and Hydro generating plants was adjusted downward by \$27 to \$45 million per year for the five-year period. This adjustment was intended to reflect the amount of spending which typically does not materialize due to changes in project costs, changes in schedules, and shifting priorities which cannot be anticipated. The 1995-1996 budget eliminates the adjustment in the Fossil & Hydro category. Actual spending in 1992 and 1993 has shown a decreased need for an adjustment. Projects with significant uncertainty in scope and timing have been included in the Uncommitted allocation.

CHAPTER 6
BULK POWER SUPPLY

CHAPTER 6
BUDGET DISCUSSION - BULK POWER SUPPLY

A. GENERAL DISCUSSION

The bulk power transmission system includes all 500 kV and 230 kV lines and switchyards, 500-230 kV substations and the high voltage side of step-down transformers to the 69 kV and 138 kV regional transmission systems.

Several major projects are included in the budget which will improve the reliability of the Susquehanna-related portion of the bulk power system, maintain the overall reliability of the bulk power system at an acceptable level and improve the economic operation of the bulk power system. A geographical summary of bulk power facilities planned for 1995-2004 is shown on a map in Appendix C of this report. A tabular summary of the facilities to be installed through 1999 follows:

TABLE 6-1
SUMMARY OF BULK POWER FACILITY ADDITIONS

	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>Total 1995-1999</u>
Lines (circuit miles) 230 kV (Reconductor)	11			40	25	76
Circuit Breakers (#) 230 kV 500 kV	5	9	5		2	21

B. IDENTIFIED PROJECTS

The identified projects in the 1995-1999 bulk power program are listed below.

1. A new control cubicle will be established in the Susquehanna 230 kV Switchyard in

1995 to increase the reliability of bulk power facilities associated with the Susquehanna plant to a high level consistent with the operational reliability of the plant.

2. In order to improve the reliability of the Susquehanna Unit 1 230 kV termination in the Susquehanna 230 kV Switchyard, the Jenkins 230 kV Line termination will be relocated from Bay 3 to Bay 4 and the Unit 1 230 kV circuit will be reterminated in a double breaker arrangement in 1995.
3. Seven 230 kV circuit breakers will be replaced at the Susquehanna 230 kV Switchyard in 1996 and 1997. The 230 kV dual pressure gas circuit breakers which terminate the Susquehanna Unit 1 generator lead circuit in Bay 3 of the Susquehanna 230 kV Switchyard and the five remaining air blast circuit breakers will be replaced with higher reliability single pressure gas circuit breakers.
4. A new Susquehanna Transformer #10 Tap 230 kV Switchyard will be established in 1995 on the west side of the Susquehanna River adjacent to the plant to improve the reliability and availability of the Transformer #10 connection.
5. The Primary #1 carrier-pilot relay systems on the Northern PL 500 kV transmission lines (Susquehanna-Alburtis, Susquehanna-Sunbury, and Sunbury-Juniata) will be upgraded by 1998. The Primary #1 carrier-pilot relaying on the Susquehanna-Alburtis 500 kV line will be replaced with a fiber optic pilot relaying system by 1996. The Primary #1 carrier-pilot relaying on the Susquehanna-Sunbury-Juniata 500 kV line will be replaced with a fiber optic pilot relaying system by May 1998.
6. A spare single phase 500-230 kV transformer will be purchased and placed at the Susquehanna plant in 1998. The current system spare transformer is located at Sunbury. Should a transformer failure occur at Susquehanna, the time required to transport the spare unit from Sunbury and the risk of damage during transport

could have significant generator curtailment implications. Purchase of a spare will reduce this exposure.

7. The Hosensack-Buxmont 230 kV Line will be reconducted in 1995 to increase thermal loading capability. This will eliminate single contingency thermal loading limits on the line and increase transfer capability at the 230 kV interface with Philadelphia Electric Co.
8. Continuous monitoring fault recorders and Alarm Management Systems to analyze system performance during fault or disturbance conditions are installed at strategic locations on the bulk power system. Recorders will be installed at Lackawanna in 1995 and at Montour, Martins Creek and Sunbury in later years to provide adequate system coverage for analysis of system disturbances.
9. Several projects are included in the construction program to upgrade deficient and unacceptable relaying on 230 kV facilities. Included in this group are the replacement of tone relays, the upgrading of automatic breaker reclosing schemes, the elimination of continuously energized auxiliary relays and the separation of primary and back-up bus differential relaying components.
10. A number of 230 kV lines have been identified for reconductoring to increase thermal loading capability. Included in this effort are the Siegfried-Frackville Line in 1998, the Martins Creek-Siegfried #2 Line in 1999, and the Brunner Island-West Hempfield Line in 1999.
11. Projects are included in the construction program to replace unreliable 230 kV circuit breakers with higher reliability single pressure gas circuit breakers. Three circuit breakers will be replaced at Martins Creek 230 kV Switchyard in 1996. At Lackawanna 230 kV Substation, four circuit breakers will be replaced, two in 1997 and two in 1999.

C. CAPITAL REQUIREMENTS

The total capital requirements for bulk power facilities for 1995-1996 are \$16.8 million. This is approximately \$7.6 million less than projected in last year's construction program and is in large part due to the deferral of the purchase of a spare 500-230 kV transformer from 1996 to 1998, a decrease in the 1995 Susquehanna Switchyard work (more work accomplished in 1994 than expected) and a decrease in the estimate of Unidentified. The total capital requirement for bulk power facilities for 1997-1999 is \$28.7 million. A summary of 1995-1999 bulk power capital requirements is shown in Table 6-2.

TABLE 6-2
SUMMARY OF BULK POWER CAPITAL REQUIREMENTS

<u>Project</u>	Million \$'s Escalated					<u>Total</u> <u>1995-1999</u>
	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	
Susquehanna - Related Projects	5.0	0.7	0.7	2.4		8.8
Northern PP&L Primary Relay Upgrade	0.5	2.7	3.7	1.5		8.4
Hosensack - Buxmont 230 KV Line	1.7					1.7
Siegfried - Frackville 230 KV Line		0.3	2.5	3.7		6.5
Martins Creek - Siegfried #2 230 KV Line			0.1	0.1	1.7	1.9
Brunner Island - West Hempfield 230 KV Line			0.1	0.1	2.2	2.4
Monitoring Recorders/Alarm Management Systems	1.2	0.2	0.5	0.9		2.8
Relaying Upgrade	0.3	1.6	0.3	1.0		3.2
Circuit Breaker Replacements	0.1	0.5	0.2		0.3	1.1
Other Specific Projects	0.6	0.2			0.2	1.0
Pools	0.4	0.3	0.3	0.3	0.3	1.6
Unidentified		0.5	1.1	1.1	3.4	6.1
TOTAL	9.8	7.0	9.5	11.1	8.1	45.5

CHAPTER 7
REGIONAL SUPPLY

CHAPTER 7
BUDGET DISCUSSION - REGIONAL SUPPLY

A. GENERAL DISCUSSION

The regional supply system transmits power from the bulk power transmission system to the area supply substations and directly supplies large power customers and accommodates Non-Utility Generators (NUGs). The regional supply system also provides outlets for a number of smaller generating stations and includes several interconnection points to neighboring systems.

The regional supply system includes all facilities from the high side of the regional transformers to the high side of the transformers of the area supply substations. These facilities include 500-138 kV, 230-138 kV, 230-69 kV, 138-69 kV, and 115-69 kV transformers, 138 kV, 115 kV and 69 kV transmission lines and switching stations, and 138 kV and 69 kV switching facilities associated with area supply substations. The system combustion turbine generators and various NUGs are also connected directly to the regional supply system.

Most of the regional supply work planned for 1995 and 1996 is required to provide additional capacity, meet regulatory requirements, improve safety or replace deteriorated equipment to prevent a decrease in the reliability of supply.

The estimated Regional Supply capital expenditures for 1995 and 1996 are \$36.6 million and \$36.0 million, respectively, and those for the 1995-1999 period are \$197 million. This year's estimate of 1995 expenditures is \$2.2 million less than last year's estimate of \$38.8 million and for 1996 is \$14.0 million less than last year's estimate of \$50.0 million. This year's estimate of total 1995-1999 expenditures is \$39.7 million less than last year's estimate.

The primary reason for the decreased cost for 1995 and 1996 is due to: lower than expected load growth; changes in schedules due to siting difficulties; project deferrals, cancellations and scope changes instituted by the Division project teams; and a decrease in the unidentified category estimates.

Appendix C contains maps of the regional supply system. Facilities that will be placed in service in the 1995-1999 five-year period are shown in red.

Table 7-1 summarizes these additions.

TABLE 7-1
SUMMARY OF REGIONAL FACILITY ADDITIONS

	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>Total</u> <u>1995-1999</u>
Added Transformer Capacity (MVA)	0	150	1200	0	600	1,950
Lines (Circuit Miles)						
New	16.2	3.4	5.3	1.8	30.2	56.9
Rebuilt/Reconducted	47.4	79.9	55.1	64.9	80.0	327.3

B. MAJOR REINFORCEMENTS

Major reinforcements, for which funds are budgeted during the 1995-1999 five-year period, include projects required to provide additional capacity and projects to maintain the standard quality of service. Additional capacity will be provided by installing transformation at one existing substation (Hummelstown 230-69 kV in 1996) and at each of three new substations (West Hempfield 230-138 kV in 1996, South Akron 230-138 kV in 1996, Lackawanna 230-138 kV in 1999), and by providing additional transmission line capacity. Projects to maintain the standard quality of service include establishing two-way supply to several major area substations and

rebuilding obsolete and deteriorated lines which have higher than acceptable failure rates.

Substation Reinforcements

In the Susquehanna Division, relaying upgrades are planned for Berwick Substation in 1998, the replacement of control cables and upgrade of relay and control facilities at Sunbury Substation are planned for 1999, and protection improvements at Fishbach Substation are planned for 1999.

In the Northeast Division, a 230-138 kV substation is planned at Lackawanna in 1999. This substation will facilitate the elimination of Peckville 230-69 kV Substation and is part of the overall Scranton Regional Reinforcement plan. A new 230-138 kV substation at Jenkins in 2000 will provide a second 138 kV supply source to the Scranton Region.

In the Harrisburg Division, the 69 kV relay and control facilities at Carlisle Substation are scheduled for modernization/replacement in 1995. In 1996, the Hummelstown 75 MVA transformer 3 will be replaced with a 150 MVA transformer to provide additional capacity to supply the increasing load in this area of the division. Also at Hummelstown 230-69 kV Substation, transformer 1 will be reconnected from the Dauphin 230 kV line to its own double breaker arrangement in 1997 to provide additional reliability and capacity in the Harrisburg east area.

In the Lancaster Region, 230-138 kV substations will be established at West Hempfield and South Akron in 1996. Protection and control equipment will be upgraded to modern standards at South Akron in 1997.

Line Reinforcements

Major line reinforcement projects are included in the 1995-1999 program to maintain

adequate capacity and reliability in the regional system.

Four line reinforcements are planned for the Susquehanna Region:

1. Reconstruction of 3.2 miles of the Clinton-Muncy 69 kV Line to double circuit is planned for 1995 to provide adequate capacity and ensure reliable supply to the Muncy and Hughesville Area.
2. The 25.7 mile Lycoming-Lock Haven 1 and 2 Lines will be reconstructed in two sections during 1997 and 1998. Existing line facilities are deteriorated and will require replacement to ensure reliable supply to the Lock Haven Area and eliminate single contingency overload concerns.
3. The Frackville-Fishbach #3 69 kV Line will be reconstructed in 1998 to eliminate limiting conductor sections in order to provide adequate capacity for the load in the Fishbach Area.
4. The 5.7 mile section of the Eldred-Pine Grove Line from Eldred to Heginn will be reconstructed in 1999 to provide adequate capacity for the southern Schuylkill area.

Seven major line reinforcement projects are planned for the Northeast Division:

1. The Hoffman-Minooka Line will be replaced with a new double circuit line in 1994. The double circuit line will provide additional capacity and voltage support to the Scranton region and eliminate the limiting conductor portion of the double circuit path from Jenkins through Scranton to Lackawanna.
2. The East Palmerton-Wagners 69 kV Line will be reconstructed for double circuit operation in 1995 and 1996 to maintain acceptable voltage levels

and provide needed additional load supply capacity for the western Pocono area.

3. The first three miles of the Lackawanna-Scranton #1 and #2 Lines will be rebuilt in 1996. Reconstructing these lines will eliminate limiting conductor sections in order to provide adequate capacity for the load growth in the Scranton region and provide a necessary path for the future conversion to 138 kV operation and the elimination of Peckville Substation.
4. The Jenkins-Minooka #1 and #2 Lines will be upgraded for 138 kV construction in 1997 to complete the double circuit high capacity path from Jenkins to Lackawanna needed for the conversion to 138 kV operation in 1999-2000.
5. The Lackawanna-Peckville #1 Line will be rebuilt for double circuit operation in 1998 to provide the two 69 kV lines needed to supply the Peckville-Varden and Peckville-Gouldsboro Lines upon elimination of Peckville Substation.
6. The Lackawanna-East Carbondale Line will be reconstructed to double circuit operation in 1999 to prevent single contingency line overloads and low voltage conditions.
7. The Jenkins-Harwood #1 Line from Jenkins to Wilkes Barre Substation will be reconstructed in 1999 to provide additional capacity for supply to Wilkes Barre and vicinity.

Five line reinforcement projects are planned for the Lehigh Region:

1. The Siegfried-Wescosville #2/Wescosville-Crackersport double circuit line between Wescosville and the Trexlertown Tap will be reconstructed in 1995 to provide additional capacity to prevent overloads for single contingency outages.
2. The 4 mile Hosensack-Upper Hanover 69 kV single circuit line between Hosensack and Upper Hanover Substation will be rebuilt for double circuit in 1995. This project will eliminate the exposure to contingency overloads for the loss of the Hosensack or Buxmont source.
3. The Siegfried-Hauto #1 and #4 69 kV Lines will be reconducted in 1995 and 1997, respectively, to eliminate the limiting conductor sections to provide additional capacity to supply load in the Hauto Area.
4. The 12 mile Wescosville-Siegfried #1 and #2 69 kV Lines will be converted to 138 kV operation by November 1999. This will require constructing 2.1 miles of new 138 kV double circuit line at Wescosville Substation, converting Schnecksville Tap to 138 kV operation, and converting three area supply substations to 138-12 kV operation and one 69 kV customer to 12 kV operation. The remainder of the line is already built for 138 kV operation. This project will eliminate the exposure to contingency overloads on the 138-69 kV transformer at Wescosville Substation and the 230-69 kV transformers at Siegfried Substation by transferring the associated load to the 138 kV system. It will also reinforce the 138 kV network by creating a double circuit 138 kV loop between Siegfried and Wescosville Substations.
5. A 12 miles section of line between Seidersville and Quakertown will be constructed in 1999 to improve supply to the Richland and Quakertown area.

Five line reinforcement projects are planned for the Harrisburg Region:

1. The 9.2 mile double circuit section of the West Shore-Carlisle #1 and #2 69 kV Lines between Mechanicsburg and Carlisle Substation will be reconducted/reconstructed in 1995 and 1996 to prevent normal and *single contingency overload conditions*.
2. The deteriorated facilities on the West Carlisle and Mt. Rock Tap Lines will be replaced from 1995 to 1998 to provide increased reliability of supply to customers in the West Carlisle Area. The wood structures on these lines have deteriorated to the point where reliability of supply is a concern.
3. A 1.3 mile section of the West Shore-Harrisburg 1 & West Shore-Cumberland 1 69 kV lines between West Shore Sub & White Hill Taps will be reconducted with higher capacity conductor in 1997 to prevent single contingency overloads.
4. A 9.3 mile section of the Juniata-Richfield 69 kV line between Newport and Thompsettown Substation will be rebuilt in 1998 to provide adequate load supply capacity.
5. A 3.2 mile section of the double circuit West Shore-Harrisburg #1 and #2 69 kV Lines between Rosemont and Harrisburg Substations will be rebuilt in 1999 to prevent single contingency overloads.

Eight line reinforcement projects are planned for the Lancaster Region:

1. The 1.5 mile section of the former Met-Ed 821/822 line between Berks Substation and the State Hill Tap will be rebuilt, and the second circuit will be installed on the State Hill Tap in 1995 to provide two-line supply to State Hill.

2. In 1996, the 3.2 mile section of the West Hempfield-Hummelstown 69 kV Line between North Columbia Tap and Donegal Substation will be rebuilt to supply growing load in the northwestern corner of Lancaster Region.
3. The 10 mile section of the South Akron-Morgantown #2 69 kV Line from the Kinzer 13 Tie to Morgantown will be reconducted in 1996 to supply new loads in the Morgantown Area.
4. In 1996, 25 miles of 69 kV line will be converted to 138 kV operation to supply growing loads in the central core of the Lancaster Region. Conversion to 138 kV operation will double the capability of these lines.
5. The 11 mile section of the South Akron-Morgantown #1 69 kV Line from the Earl #1 Tap to Morgantown Substation will be reconducted in 1998 to supply new loads in the Morgantown Area.
6. A 1.6 mile 69 kV tie line will be constructed between the Kellogg Taps and Landisville Substation in 1998 to reinforce transfer capability between South Manheim and West Hempfield substations to supply the loads during outages of 230-69 kV transformers.
7. The 7.8 mile Morgantown 2-Kinzer 13 Tie will be reconducted in 1998 to reinforce back-up supply to the loads in the southern portion of the Lancaster Region for a double circuit line failure of the Face Rock-Kinzer Line.

In addition to the regional line reinforcement projects, 5 area supply substations will be connected to the regional supply system in 1995 and 1996. An additional 7 substations will be connected from 1997 through 1999.

C. PROGRAM TO UPGRADE THE 69 KV CAPACITOR BANK CONTROLS AND PROTECTION SCHEMES

As a follow-up to the PCB Capacitor Bank Replacement Program, the 69 kV capacitor bank controls and protection schemes will be upgraded. This program has an estimated total cost of approximately \$0.9 million for the 1995-1999 period. The new control and protection schemes will provide improved capacitor bank reliability and will eliminate voltage transient conditions that can decrease capacitor can life and degrade voltage quality.

D. AIR BREAK SWITCH CONVERSION PROGRAM

The System Operating Department has identified a number of air break switches on the regional supply system that are not equipped with parallel break interrupters, but are sometimes required to break parallel current. A program has been established to modify or replace a significant number of these switches. The existing air break switches are not rated for parallel break capability and operating integrity may be compromised with the continued use of air break switches to break parallel current. Approximately 19 switches will be modified or replaced in 1995 and 1996 at an estimated cost of \$0.3 million.

E. LAMINATED WOOD UPSWEPT ARM REPLACEMENTS

Laminated wood upswept arms were purchased during the early 1970s for use on regional 69/138 kV lines. A program began in 1992 to replace a significant number of these wood upswept arms which have deteriorated. The deterioration lessens the mechanical strength of the arms and has resulted in some arm failures on the PP&L system. Recent analysis has shown that the deterioration is not as serious as first anticipated and the program has been adjusted accordingly.

The deteriorated laminated wood arms will be replaced with the current standard upswept steel arms. Arm replacement work has been budgeted at \$0.5 million per year.

F. LOWER STRUCTURE GROUND RESISTANCE

The performance of some 69 kV and 138 kV circuits during T&L has been less than desirable. A program to improve performance by installing counterpoise to reduce structure ground resistance to minimize the number and frequency of flashovers on double circuit lines was begun in 1992 and is scheduled to continue through the 1995-1999 period. Supply lines to a number of large customers have been tested and modified with positive results. Structure ground resistance reduction work has been budgeted at \$1.6 million for 1995-1999.

G. CAPITAL REQUIREMENTS

Capital requirements for development of the regional supply system in the five-year period, 1995-1999, are projected to be \$198 million (escalated). The capital requirement for the first two years, 1995-1996, is \$73 million. The estimated capital requirement for the following three years, 1997-1999, is \$125 million. Table 7-2 at the end of this chapter summarizes the capital requirements for the five-year period.

During the five-year period, 1995-1999, approximately \$148 million (75%) is required for capacity reinforcement projects due to load growth, and \$49 million (25%) is required for system reliability projects which include improvements, relocations, regulatory requirements, NUG, and for the elimination, replacement or upgrade of deteriorated equipment.

TABLE 7-2
SUMMARY OF REGIONAL SUPPLY CAPITAL REQUIREMENTS

Project	Million \$'s Escalated					Total 1995-1999
	1995	1996	1997	1998	1999	
Substation Projects						
Hummelstown (Transformer)	0.2	1.6	0.7			2.5
Lackawanna (New)	0.2	0.7	3.8	4.3	0.3	9.3
So. Akron (New)	4.4	5.0				9.4
W. Hempfield (New)	3.1	6.6				9.7
Jenkins (New)		0.1	0.3	0.2	1.1	1.7
Springfield (New)				0.5	1.1	1.6
Fishbach (Upgrade)				0.1	0.6	0.7
Berwick (Upgrade)				0.7		0.7
Sunbury (Upgrade)		0.1	0.3	2.5	1.3	4.2
Conestoga (Upgrade)			0.3	0.5	4.0	4.8
So. Akron (Upgrade)				0.1	1.0	1.1
Major Line Projects						
Frackville-Fishbach #3			0.2	1.4		1.6
Girardville Tap			0.2	0.2	0.7	1.1
Eldred-Pine Grove	0.1	0.1	0.7	1.2	1.7	3.8
Clinton-Muncy	1.1					1.1
Lycoming-Lock Haven #1&2	2.8	1.2	5.5	5.1		14.6
Fishbach-Pine Grove		0.1	0.1	0.7	1.3	2.2
Hoffman-Minooka	3.3					3.3
Lackawanna-Peckville #1		0.1	0.1	1.8		2.0
Jenkins-Minooka #1&2	0.2	0.4	0.6			1.2
Lackawanna-East Carbondale		0.1	0.4	0.1	3.2	3.8
Jenkins-Harwood #1	0.1	0.3	0.7	1.3	2.1	4.5
East Palmerton-Wagners	3.6	2.0				5.6
Seidersville-Quakertown	0.8	1.4	3.9	7.3	2.9	16.3
Wescosville-Siegfried #1&2	0.3		2.9	4.0	1.0	8.2
Ridge Road Tap	1.7					1.7
Siegfried-Hauto #4		0.1	1.0			1.1
Henryville Tap	0.2	0.3	2.4			2.9
West Shore-Carlisle #1&2	3.0	0.8				3.8
West Shore-Harrisburg 1&2	0.1	0.1	0.1	1.6	3.2	5.1
West Carlisle & Mt. Rock Taps	0.6	0.5	0.6	0.3		2.0
Juniata-Richfield	0.1	0.3	1.8	1.4		3.6
West Hempfield-South Manheim #1&2	0.1	1.5				1.6
Penn Castings-Kellogg Tap	0.2	0.4	0.2	0.5		1.3
South Akron-Earl	0.2	0.2	2.0	2.1	6.5	11.0
South Akron-Morgantown #1&2	1.0	0.6	1.3	1.1		4.0
New Morgan Tap	0.2	0.2	0.1	1.0		1.5
821/822 Line	1.1					1.1
West Hempfield-Hummelstown	0.9	0.8				1.7
Engleside-South Akron	0.2	2.2				2.4
Other Specific Projects	3.5	2.4	1.9	1.7	4.4	13.9
Pools	3.3	5.3	3.6	3.2	3.6	19.0
Unidentified	--	0.5	2.1	1.1	1.1	4.8
TOTAL	36.6	36.0	37.8	46.0	41.1	197.5

CHAPTER 8
AREA SUPPLY

CHAPTER 8
BUDGET DISCUSSION - AREA SUPPLY

A. GENERAL DISCUSSION

The Area Supply System links the regional supply system to the customer's point of delivery. Area supply facilities include 69-12 kV and 138-12 kV substations, 12 kV lines, 23 kV and 4 kV systems, and the 120/208 volt Low Tension Networks.

Most of the area supply work planned for 1995 and 1996 is required to provide additional capacity, to meet OSHA, EPA or other regulatory requirements, to improve the safety of the workplace or to replace excessively deteriorated facilities in order to prevent a decrease in reliability of supply. Reliability of supply will also be improved inherently by: having more substation sources to supply the distribution system; adding 12 kV lines at new and existing substations; converting 4 kV systems to 12 kV; and reconstructing distribution facilities to meet modern standards of performance and appearance.

As the area supply system grows older, many facilities are approaching the end of their useful lives. Work has begun in recent years to replace or upgrade deteriorated and obsolete facilities. Several projects involving the replacement or modernization of old and outmoded facilities, LTN vault reconstruction projects systemwide, and the replacement of deteriorated underground cables are included in this budget.

The estimated Area Supply capital expenditures for 1995 and 1996 are \$48.3 million and \$46.6 million, respectively, and those for the 1995-1999 period are \$239.4 million.

This year's estimate of 1995 expenditures is \$5.6 million less than last year's estimate of \$53.9 million and for 1996 is \$5.9 million less than last year's estimate of \$52.5 million. This year's estimate of total 1995-1999 expenditures is \$8.2 million over last year's estimate. The decreased cost for 1995 and 1996 are a result of project deferrals (lower than expected load growth), project changes (cancellations, deferrals, scope changes, reduced cost estimates) resulting from reviews by the division project

teams, and a reduction in the underground cable replacement program. The increase over the five year period is due to newly identified projects in the later years and elimination of the \$4 million underspending adjustment.

B. IDENTIFIED PROJECTS

1. New Substations

New substation projects will provide additional capacity to supply existing and future loads, will improve reliability by providing additional 12 kV sources and shorter 12 kV lines, and will economically provide adequate voltage and protection on the distribution system.

Four new 69-12 kV substations are scheduled and budgeted for 1995. Provisions are also being made for engineering three new 69-12 kV substations for a 1996 completion. A total of \$7.0 million is budgeted for new or rebuilt substations in 1995 and 1996.

In addition to the 1995-1996 program outlined above, 9 more new substations are estimated to be required by 1999 to supply increasing loads, 12 substations are scheduled to be converted from 69-12 kV operation to 138-12 kV operation and funds are budgeted for 20 substation reinforcement projects.

2. New 12 kV Lines and Terminals

New 12 kV lines and terminals are required to provide additional capacity to supply existing and future loads. They increase load transfer capability, improve voltage regulation, allow improved protection arrangements on the distribution lines, improve reliability by reducing 12 kV line exposure, and reduce line losses through lower average facility loading.

A total of 34-12 kV circuit breaker line terminals and associated line connections will be installed at new and existing area supply substations in 1995 and 1996.

Of the total, 17 line terminals costing \$5.2 million will be installed at existing area supply substations, and 17 line terminals will be installed at new 69-12 kV substations in 1995 and 1996 (costs for the 12 kV line terminals at new 69-12 kV substations are included in the total costs for new substations).

3. Reconductoring/Reconstruction, Additional Phase Conductors, Miscellaneous Tie Lines

These projects are required to provide additional capacity in the distribution system to supply existing and future loads. Inherent benefits of providing this capacity are improved reliability and improved voltage conditions. Some of these projects are being installed solely to bring voltage levels to within acceptable limits or to provide load relief for overloaded protective devices. A total of \$10.6 million has been included for these projects in 1995 and 1996.

4. 4-12 kV Conversions

Approximately \$1.8 million in 1995 and 1996 is budgeted for converting 4 kV distribution systems to 12 kV.

Many 4 kV systems have become severely deteriorated over the years and many of the facilities are approaching the ends of their useful lives. Replacement parts are becoming increasingly difficult to obtain.

Conversion of these systems will eliminate non-standard construction, provide a modern rebuilt distribution system, eliminate unnecessary transformations, reduce maintenance costs and also reduce distribution system losses. Current plans call for completion of the 4 kV conversions systemwide by 1997.

5. Low Tension Networks

This category includes specific projects which have been identified in the low-tension networks for additional capacity and reliability. A total of \$5.5 million is budgeted for 1995 and 1996 for these projects.

A Low-Tension Network Rehabilitation Program is included in the above dollars to correct structural integrity, reliability, and OSHA and PP&L safety standards problems. Projects to correct major deficiencies have been identified and have been included in the Construction Program. Other newly identified projects in this category will be included in the Construction Program on an "as-required" basis.

C. AREA POOL ITEMS

1. Relocations Due To Right-Of-Way Requirements

Provision has been made for total expenditures of \$8.1 million in 1995 and 1996 for relocations due to right-of-way requirements, about \$4.0 million in 1995 and \$4.1 million in 1996. This item is credited with reimbursement payments, and the net amount charged during any one calendar year can vary greatly from budget.

2. Replacement of Deteriorated Underground Distribution Cables

A total of \$4.9 million is the current estimate of funding required for 1995 and 1996 for the replacement of deteriorated underground distribution cables.

Approximately \$2.4 million is budgeted in 1995 and \$2.5 million in 1996.

3. Replacement of Deteriorated Copperweld Conductor

A total of \$1.1 million is budgeted for Copperweld conductor replacement in 1995 and 1996. Approximately \$0.5 million is budgeted in 1995 and \$0.6 million in 1996.

4. 69-12 kV and 138-12 kV Transformer Requirements

Transformer requirements are budgeted on an "as required" basis and these units are purchased and delivered according to required in-service dates. A total of \$0.4 million is budgeted in 1996 for 69-12 kV transformers and \$2.7 million in 1995 and \$1.1 million in 1996 for 138-12 kV transformers.

5. Power Circuit Breakers

The \$0.7 million total allocated for 1995 and 1996 includes the purchase of all power circuit breakers for use at all new area supply substations, as well as additional terminals at existing area supply substations. Approximately \$0.2 million is budgeted in 1995 and \$0.5 million in 1996.

6. Area Supply Improvements

A total of \$1.6 million for 1995 and 1996 is allocated for Area Supply improvements which cover a number of minor miscellaneous distribution reinforcement projects for which specific budget items are not necessary. Approximately \$0.8 million is budgeted in 1995 and \$0.8 million in 1996.

A pool item is included for the repair of failed 69-12 kV power transformers that are capitalized. Approximately \$0.4 million is allocated annually for these repairs in 1995 and in 1996.

A pool item is included for the replacement of Low Tension Network primary cables. These cables were generally installed in the 1960's and early 1970's and are expected to have a service life of 20 to 25 years. A total of \$0.1 million is allocated for 1995 and \$0.1 million for 1996.

D. AREA BLANKET ITEMS

The funds for each division's portion of each blanket are authorized separately. This

- assures accountability for blanket spending at the division level.

1. Pole Replacements 23 kV and Under

A total of \$7.9 million has been allocated for 1995 and 1996 for pole replacements at 23 kV and under. About \$3.9 million is budgeted in 1995 and \$4.0 million in 1996. It is estimated that approximately 3000 poles on the system will require replacement in 1995 due to deterioration. Those poles which must be replaced due to motor vehicle breakage are included in Distribution Department-Storms and Emergencies.

2. Distribution Capacitor Program

The distribution capacitor program is part of the total system reactive supply and voltage support program. Its aim is to supply all area supply reactive loads and losses from within the area supply system while maintaining adequate voltage levels on the distribution lines. This is accomplished entirely with 12 kV shunt capacitors. About 70 MVAR of capacitors are required per year in 1995 and 1996 to attain an average of unity power factor at peak load on the high side of the 69-12 kV and 138-12 kV transformers at area supply substations. Capacitors will also be purchased in 1995 and 1996 for capacitor failures.

A total of \$0.8 million has been allocated for the installation of capacitors in 1995 and \$0.8 million in 1996.

3. Oil Circuit Reclosers

The allocation for OCRs is \$1.4 million for 1995 and \$1.4 million for 1996. In addition to installing new units, this budget item includes replacing worn out, damaged, overdutied or overloaded oil circuit reclosers on the distribution system. This work maintains service continuity, facilitates operation and maintenance, and reduces operating costs.

4. Distribution Department Minor - Lines

A total of \$4.9 million is budgeted for 1995 and \$5.0 million for 1996 for minor line items in the Distribution Department. This work includes minor additions and replacements of distribution line facilities required to facilitate maintenance and operation, to meet increased demand due to system load growth, to reduce operating costs and to maintain or upgrade reliability to acceptable levels.

5. Distribution Department Minor - Substations

This blanket is budgeted for a total of \$0.3 million in 1995 and \$0.3 million in 1996. This item provides funding for minor additions and replacements of distribution substation facilities. This work is required to facilitate operation and maintenance, reduce operating costs, and to maintain or upgrade reliability to acceptable levels.

6. Distribution Department - Storms and Emergencies

This blanket is budgeted for a total of \$2.7 million in 1995 and \$2.8 million in 1996. This item covers all expenditures which can be classified as non-discretionary--in other words, those projects which are caused by forces outside the control of the division. This includes storms, relocations, and damage to facilities caused by motor vehicles.

7. Distribution Department - Install MOVs and MOVEs at Specific UG Cable Locations

This blanket is designed to significantly extend the life expectancy of underground (UG) cable by applying metal oxide varistors (MOVs) to underground development terminal poles and metal oxide varistor elbows (MOVEs) at normally open points on UG cable installations. The application of the MOVs and Elbow arrestors will provide improved surge protection which extends underground cable life by limiting the severity of overvoltages and retarding further cable degradation due to fault

tree growth. Total funding for 1995 and 1996 is \$1.6 million. Approximately \$0.8 million is budgeted in 1995 and \$0.8 million in 1996.

8. Distribution Department - Replace Failed and/or Deteriorated, Non-Repairable Equipment

This program covers failed and deteriorated distribution equipment and allows improved tracking of the costs of these failures. Total funding for 1995 and 1996 is \$2.1 million (\$1.0 million in 1995 and \$1.1 million in 1996).

9. Distribution Department - Foreign Utility Work

This item separates work requested by foreign utilities from the Storm and Emergency blanket to provide improved tracking. Total funding for 1995 and 1996 is \$1.8 million (\$0.9 million in 1995 and \$1.0 million in 1996).

E. CAPITAL REQUIREMENTS

TABLE 8-1
AREA SUPPLY EXPENDITURES
\$ MILLIONS - ESCALATED

	<u>1995</u>	<u>1996</u>
New, Rebuilt and Modified Substations	7.3	8.2
Additional Lines & Terminals	1.9	3.2
Lines: Reconductor/Reconstruct/Add'l. Phases	6.8	3.8
4-12 KV Conversions	1.4	0.4
Low Tension Networks (incl. 4-12 KV convs.)	2.9	2.6
<u>Area Pool Items:</u>		
Relocation Due to R/W Req.	4.0	4.1
Replacement of Deteriorated UG Cable	2.4	2.5
Purchase 69-12 KV and 138-12 KV Xfmrs.	2.7	1.5
Purchase Power Ckt. Breakers	0.2	0.5
Replace Deteriorated Copperweld Conductor	0.5	0.6
Other Pool Items	1.5	1.6
<u>Area Blanket Items:</u>		
Pole Repls. - 23 KV & Under	3.9	4.0
Capacitors - 23 KV & Under	0.8	0.8
Oil Circuit Reclosers	1.4	1.4
Distr. Dept. Minor - Lines	4.9	5.0
Distr. Dept. Minor - Subs	0.3	0.3
Distr. Dept. - Emerg./Requested Changes	2.7	2.8
Distr. Dept. - Foreign Utility Work Program	0.9	0.9
Distr. Dept. - MOV's and Elbow Arrestors Installation	0.8	0.8
Distr. Dept. - Replace Failed Equipment	1.0	1.1
Unidentified		0.5
TOTAL (Escalated)	48.3	46.6

The above Table 8-1 details the Area Supply expenditures required in 1995 and 1996.

In a less detailed format, the following Table 8-2 shows the expenditures for Area Supply facilities for the 1995-1999 period:

TABLE 8-2
AREA SUPPLY EXPENDITURES
\$ MILLIONS - ESCALATED

	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	Total <u>1995-1999</u>
Specific Identified Projects	20.3	18.2	16.5	18.4	15.2	88.6
Area Pool Items	11.3	10.8	10.9	12.4	13.1	58.5
Area Blanket Items	16.7	17.1	17.7	18.2	17.8	87.5
Unidentified	--	0.5	2.1	1.1	1.1	4.8
TOTAL	48.3	46.6	47.2	50.1	47.2	239.4