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REPORT BY THE

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Comptroller General

OF THE UNITED STATES

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Three Mile Island: The Financial Fallout

The nuclear accident at Three Mile Island raised serious questions about the financial ability of the electric utility company owners to clean up and repair the damaged reactor facilities while continuing to provide reliable electric service to customers.

Financial insolvency of the companies is not imminent and power supplies are assured for the immediate future. However, the loss of earnings capability by the Metropolitan Edison Company makes it questionable whether it can fund its share of the clean-up costs and maintain system reliability without large rate increases or some external financial assistance.

The accident has shown that the utilities and Federal and State regulatory agencies were not prepared to deal with recovery from such a large financial loss. The Department of Energy should move swiftly to assess the financial needs of the affected utilities and develop plans for meeting them.

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COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

B-199244

The Honorable Gary Hart, Chairman
The Honorable Alan K. Simpson
Ranking Minority Member
Subcommittee on Nuclear Regulation
Committee on Environment and
Public Works
United States Senate

As requested in your January 18, 1980, letter, this report discusses the financial capability of the General Public Utilities Corp. and its operating companies to fund the costs of cleaning up the damaged reactor unit 2 at Three Mile Island. It also discusses the companies' capability to continue providing reliable electric power and the actions taken, or not taken, by the responsible Federal and State regulatory agencies. The report contains a recommendation regarding the need for an additional study of the issues before a final decision can be made as to the need for outside financial assistance.

At your request, we did not take the additional time required to obtain agency comments on the matters discussed in this report.

Unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days from the report date. At that time, we will send copies to interested parties and make copies available to others upon request.

Milton J. Socolar

Acting Comptroller General
of the United States

REPORT BY THE
COMPTROLLER GENERAL
OF THE UNITED STATES

THREE MILE ISLAND: THE FINANCIAL FALLOUT

D I G E S T

The nuclear accident at the Three Mile Island powerplant triggered a number of serious problems for the General Public Utilities Corporation, including a near financial crisis, as it moved to purchase high-cost replacement power to maintain service to its customers. During the year following the accident, the Corporation was recovering only a small part of the $233 million of power costs from utility rates.

Important financial questions were raised by the accident.

--Can the utilities afford the estimated $500-600 million needed to decontaminate and repair the damaged nuclear reactor and related facilities while continuing to fund an additional $2 to 3 billion in capital expenditures to insure reliable electric service to their customers?

--What are the financial alternatives for meeting the large costs?

--Have Federal and State regulatory agencies effectively dealt with the situation?

These are questions that could affect the future of nuclear power generation as well as Three Mile Island.

In the case of Three Mile Island, GAO studied these questions and concluded that:

--Adequate supplies of replacement power are currently available but reliability of future service may be questionable if too much reliance is placed on power purchases instead of system generations.

--The Companies' cash flow problems caused by funding power purchases have been alleviated for the present by rate increases.

--The reduced earnings capability from closing down the Three Mile Island facility has seriously impaired Metropolitan Edison Company's ability to raise the necessary capital to finance its share of the clean-up costs and continue to maintain its power supply system.

--The alternatives for financial recovery are few--higher rates to cover the added costs, a restoration of the companies' credit rating, or some form of external assistance.

--Regulatory agencies have not provided the utilities with a clear sense of direction on actions to undertake in recovering from the accident and planning for future needs.

POWER SUPPLIES UNAFFECTED BUT FUTURE RELIABILITY QUESTIONABLE

The General Public Utilities Corporation membership in the Pennsylvania-New Jersey-Maryland power pool and its extensive interconnections with other utility systems has allowed it to buy power to replace that lost from the Three Mile Island reactors. Present estimates of the power pool's reserve capacity above expected needs indicate that replacement power will be available to the General Public Utilities system for the next decade. However, these are the best estimates of member utilities and it is possible that unforeseen events could quickly reduce this reserve below an acceptable level. (See pp. 9, 10, and 16.)

Additional power has been available from utilities outside the power pool, but only about 400 megawatts have been on firm contract. An additional 1000 megawatts have been purchased on an as-available basis with no guarantee of delivery when needed. (See p. 10.)

Before the accident the operating companies planned to complete construction of three

additional generating plants by 1990. Financial problems from the accident now make it uncertain whether they will be built as scheduled. A further complication is a costly conservation and load management program which is expected to reduce the need for additional capacity by nearly one-half but which may not be as effective as anticipated. (See pp. 9, 10, 48, and 49.)

HIGH COST OF PURCHASED POWER HURT COMPANIES' CASH FLOW AND RAISED RATES

The higher cost of replacement power was not initially included in customers' utility rates and the companies had to find outside funding. A Revolving Credit Agreement arranged with 45 banks provided up to $292 million to meet current expenses. (See pp. 19, 26, 30, and 40.)

The companies' ability to obtain power from the power pool immediately after the accident insured reliable service. However, this power was largely oil generated and costly. As soon as possible, the companies arranged to purchase coal-generated power from outside the power pool, reducing costs by nearly $45 million in 1979. Even with this savings, the companies' net purchases and power pool interchange more than doubled the amount for 1978. Replacement power costs for 1980 are expected to be about $325 million and to continue at that level until the nuclear units are returned to service. (See pp. 7, 18 and 19.)

Customer rate increases were finally approved by State regulatory agencies in June 1979. The increases were not sufficient to recover the Companies' actual costs which made it difficult for the companies to obtain enough cash to pay current expenses. If present estimates for purchased power are reasonably accurate, and no further rate increases are granted, the companies will pay out about $192 million more than they will collect by the end of 1980. This makes short-term bank credit imperative. (See pp. 31, 32, 33, and 45.)

Customer rates generally did not increase appreciably until the May 1980, rate increase ordered by the Pennsylvania and New Jersey regulatory agencies. The Jersey Central Power and Light Co. increased rates more than did the Pennsylvania Electric Co. and Metropolitan Edison Co. primarily because of $200 million in increases granted the company for costs not caused by the Three Mile Island accident. As of April 1, 1980, Jersey Central Power and Light Co. rates were fourth highest among 13 major Pennsylvania, New Jersey, and New York utility companies. The other two companies currently charge rates well below charges by other utilities. (See pp. 21 and 30.)

REDUCED EARNINGS WILL LIKELY AFFECT COMPANIES' ABILITY TO PAY CLEAN-UP COSTS AND MAINTAIN RELIABILITY

The State regulatory agencies' decisions to remove the costs associated with the Three Mile Island units from the companies' rate bases have reduced the earnings capability of Jersey Central Power and Light Co. and Metropolitan Edison Co. to the point where they have minimal access to capital markets. This leaves them in a relatively poor financial position with respect to paying their share of the clean-up and recommissioning costs for unit 2 and making needed repairs and additions to their transmission and distribution systems. (See pp. 28, 29 and 39.)

Except for some flexibility in their short-term borrowing arrangements, Jersey Central Power and Light Co. and Metropolitan Edison Co. depend on rate revenues to meet current and future costs. Neither company can meet the legal requirements for interest coverage and therefore, are excluded from selling long-term bonds and preferred stock. Their bond and stock ratings have dropped to an unacceptable level making it difficult, if not impossible for them to sell securities in the market even if the legal requirements were met. (See p. 29.)

Metropolitan Edison Co. is not earning enough on its non-Three Mile Island utility property to pay the fixed costs of the two nuclear units. If earnings do not increase substantially in the near future, it is questionable whether the company will be able to obtain the necessary funds to pay its share of unit 2 costs and maintain its present electric power system. (See p. 48.)

Although Jersey Central Power and Light Co. has not been affected as severely as Metropolitan Edison Co., unrecoverable interest costs on the Forked River nuclear plant, the costs of other construction to better meet load requirements, and the clean-up costs and funds for transmission and distribution construction will place an increasingly heavy burden on its finances. (See pp. 30, 46, and 48.)

NO CLEAR DIRECTION PROVIDED BY FEDERAL AND STATE REGULATIONS

Regulatory controls over the utility companies' activities are fragmented among three major Federal and two State agencies. In determining the proper course to take in planning for clean-up of the nuclear site, their additional capacity requirements, and methods of financing, the utilities have received little guidance on future regulatory requirements or assistance. (See pp. 2-4, and 34-39.)

State regulatory agencies have the major responsibility for providing a level of rates adequate to insure the financial viability of utility companies. Since January 1979, the State agencies have granted rate increases amounting to over $680 million to be collected by the end of June 1981. At the time of their last rate orders issued in May 1980, the Pennsylvania and New Jersey regulatory agencies both accepted the responsibility for maintaining the viability of the three companies. They did not, however, provide assurances that all future costs would be recoverable through rates. In fact, they

urged the Federal government to provide some assistance and lessen the burden from the accident on the utilities' customers. This position leaves the utilities uncertain as to what future costs will be recoverable through rates. (See pp. 31-37.)

Although the Department of Energy has the responsibility for bulk electric power supply reliability, it has done little more than monitor the availability of power supplies. The Federal Energy Regulatory Commission regulates wholesale power rates. It has ruled on two wholesale rate filings but skirted the issue of how the accident should be considered for rate purposes. Most of the Federal involvement has been by the Nuclear Regulatory Commission in setting restart requirements for unit 1 and monitoring clean-up activities by the companies at Unit 2. The lengthy public hearing it has required before making its restart decision is a different procedure from that set for other Babcock and Wilcox reactor owners, as are a number of changes required to improve the operational safety of units. Although the conditions at Three Mile Island probably justified the different treatment, the lack of well defined criteria for meeting the requirements has been a factor in delaying the completion of the pre-start hearings. The lack of direction by DOE on capacity needs and scant guidance by the Nuclear Regulatory Commission have added further uncertainties to determining the future course of the General Public Utilities Corporation.

RECOMMENDATION TO THE SECRETARY OF ENERGY

The Secretary of Energy should undertake a detailed study of the General Public Utilities system regarding its future role as a provider of electric power, the financial considerations involved in ensuring the system can fill such a role, the ways in which finances best

can be obtained, and the relationships of the various State and Federal regulatory agencies with respect to the system's current problems. The Chairman, Nuclear Regulatory Commission and the Chairman, Federal Energy Regulatory Commission should cooperate and contribute to this study to the fullest extent possible. Given the wide range of studies either completed or underway on a number of issues to be considered by the study, GAO believes the report should be presented to the Congress no later than February 1, 1981, including a statement of any specific actions to be taken by the utilities or any of the Federal agencies and any recommendations to the Congress. (See p. 61 for detailed questions the Secretary should consider in making this study.

RECOMMENDATION TO THE CHAIRMAN, NUCLEAR REGULATORY COMMISSION

Given the significant effects on the financial viability of the utilities and on consumer rates in their service areas, GAO also recommends that the Nuclear Regulatory Commission move as quickly as possible, while taking all necessary steps to protect the public health and safety, to consider and act on the question of restarting Three Mile Island unit 1. In addition, GAO recommends that the Chairman cooperate fully with the Secretary of Energy in the study of the General Public Utilities system and its needs and provide all possible assistance in fully developing the regulatory responsibilities of the Commission as they relate to the restart, clean-up, and recommissioning of the nuclear units.

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ABBREVIATIONS

ASLB	Atomic Safety Licensing Board
B&W	Babcock and Wilcox
DCF	Discounted Cash Flow
DOE	Department of Energy
ERA	Economic Regulatory Administration
FERC	Federal Energy Regulatory Commission
GAO	General Accounting Office
GPU	General Public Utilities Corporation
JC	(See Jersey Central)
Jersey Central	Jersey Central Power and Light Company
Kwh	Kilowatt hour
LEAC	Levelized Energy Adjustment Clause
MAAC	Mid-Atlantic Area Council
ME	(See Met Ed)
Met Ed	Metropolitan Edison Company
MW	Megawatt
NJBPU	New Jersey Board of Public Utilities
NRC	Nuclear Regulatory Commission
O&M	Operation and Maintenance
PaPUC	Pennsylvania Public Utility Commission
Penelec	Pennsylvania Electric Company
PJM	Pennsylvania-New Jersey-Maryland
PN	(See Penelec)
RCA	Revolving Credit Agreement
SEC	Securities and Exchange Commission
TMI	Three Mile Island

CHAPTER 1

INTRODUCTION

In a January 18, 1980, letter, the Chairman and the ranking minority member of the Subcommittee on Nuclear Regulation, Senate Committee on Environment and Public Works, requested that we examine certain aspects of the financial and operating status of the General Public Utilities Corporation (GPU) and its operating companies following the accident at the Three Mile Island (TMI) nuclear plant. We were asked to assess the (1) continued reliability of electric service to utility customers, (2) increased costs resulting from the accident, (3) impact of the accident and its aftermath on the GPU companies' ability to meet their financial obligations and (4) actions taken by the major regulatory agencies with direct responsibility and/or oversight for GPU.

OVERVIEW OF GPU

GPU is an electric utility holding company registered under the Public Utility Holding Company Act of 1935. GPU does not directly provide any utility services, but owns all the outstanding common stock of the operating companies: Jersey Central Power and Light Company (Jersey Central) in New Jersey, and the Metropolitan Edison Company (Met Ed) and the Pennsylvania Electric Company (Penelec) in Pennsylvania. GPU's current investment in the common stocks of the three companies is approximately $1.4 billion.

The three companies provide electricity to about 4 million people living in about half the land area of New Jersey and Pennsylvania. In 1979, they distributed over 32 billion kilowatt hours of electric power to over 1.5 million customers. GPU also owns all the stock of the GPU Service Corporation, which serves the needs of the GPU System. The Service Corporation provides services such as administrative, financial, and engineering help to the operating companies on a cost-reimbursable basis.

GPU issues its own common stock to the public on which it pays dividends from its earnings on the common stock of the operating companies. The operating company dividends represent virtually all of GPU's earnings. GPU provides funds to the operating companies by making capital contributions, i.e., additional equity investments. The operating companies also obtain capital funds by issuing long-term debt securities and preferred stock.

The GPU System has total assets of about $5 billion, making it the Nation's 14th-largest investor-owned electric utility. In 1978, the companies completed their third nuclear reactor unit and generated 34 percent of their power from these units. Most of the remaining generation came from coal-fired plants. According to GPU officials, the reduced fuel costs from operating nuclear units, instead of oil or coal-fired units, have saved GPU System customers nearly $1 billion since the first nuclear reactor at Oyster Creek in New Jersey went commercial in December 1969.

On March 28, 1979, an accident occurred in the then recently activated unit 2 at the System's TMI nuclear facility. The accident precipitated a series of events that resulted in damage to the reactor and radioactive contamination to components that was estimated to cost between $420-450 million to clean up and repair.1/ In addition, unit 1, which was ready to restart the day of the accident after being shut down for refueling, was ordered to remain shut down until the Nuclear Regulatory Commission (NRC) could certify that mandated changes had been properly completed and the unit was safe to operate.

SEVERAL AGENCIES HAVE REGULATORY RESPONSIBILITY FOR GPU

Three Federal agencies and the Pennsylvania and New Jersey public utility commissions exercise jurisdiction over various segments of GPU System activities. Their regulatory control became increasingly evident as the companies were required to delay putting TMI-1 back in service and were not allowed to immediately pass on the higher costs of power purchases necessitated by the loss of TMI-1 and 2 nuclear units.

The Nuclear Regulatory Commission

The Nuclear Regulatory Commission is responsible for licensing and regulating GPU's nuclear units, including TMI-1 and 2, under the Atomic Energy Act of 1954, as amended, and the Energy Reorganization Act of 1974, as amended. This responsibility includes providing reasonable assurance that the use of nuclear reactors does not result in undue risks to the health and safety of the public.

1/Estimates as of June 12, 1980, indicate costs will be substantially higher.

The Department of Energy

The Department of Energy (DOE), in consultation with the Federal Energy Regulatory Commission (FERC), has the responsibility for assuring the reliability of electric bulk power supply throughout the United States. The basic authority for Federal regulation of electric utility companies comes from the Federal Power Act of 1935. The DOE Organization Act of 1977 (P.L. 95-91) divided the responsibilities held by the Federal Power Commission until September 30, 1977 between the Secretary of Energy and FERC. The Secretary may in turn delegate certain of these powers to FERC or the Economic Regulatory Administration (ERA). ERA has been delegated responsibility for assuring the adequacy of bulk power supply and monitoring State regulatory bodies' reviews of various rate structures and standards. FERC has jurisdiction over the interstate transmission and approval of wholesale for resale rates of electricity. It also has jurisdiction over facility agreements, interstate transmission rates, and capacity and energy sales between companies and between power pools.

In addition to these responsibilities and authorities, the Department was given additional authority in the electric power area by the Public Utilities Regulatory Policies Act (P.L. 95-617). ERA was given authority to provide assistance on regulatory reform and support FERC on ratemaking and cost of service matters, intervene in regulatory cases at both State and Federal levels on national energy policy issues, and perform studies relating to power supplies and reliability.

The Securities and Exchange Commission

The Securities and Exchange Commission (SEC) administers the Public Utility Holding Company Act of 1935 (15 U.S.C. 79, et seq.). The purpose of the Holding Company Act is to protect the public, investors, and consumers from abuses associated with the control of electric utility companies by use of the holding company device. It is in part a specialized antitrust statute with the objective of reorganizing and constraining the operations of utility holding companies, and in part a regulatory statute providing for continued surveillance of the corporate structure, financial transactions, and operational practices of public utility holding company systems.

State public utility commissions

The Pennsylvania Public Utility Commission (PaPUC) and the New Jersey Board of Public Utilities (NJBPU) have key roles in determining the future financial viability of the GPU operating companies. Through the ratemaking process, State regulators may review a utility's expenses, set the amount of revenues the utility will be able to collect, and determine the appropriate rate of return it can earn on its investments. Through these mechanisms, the regulators determine the amount of profit a company can reasonably be expected to make.

OUR OTHER RELATED WORK

We responded to several requests that we examine various facets of nuclear regulation and the TMI accident. Our report, "Placing Resident Inspectors at Nuclear Power-plant Sites: Is it Working?" (EMD-80-28, Nov. 15, 1979), discussed changes that are being made in NRC's resident inspection plan to improve nuclear reactor safety. A letter report (EMD-80-76, May 27, 1980) addresses the question "Do Nuclear Regulatory Commission plans adequately address regulatory deficiencies highlighted by the Three Mile Island accident?" We are currently completing work on two other assignments. On one assignment we monitored the investigations being made of the TMI accident by the various groups and commissions to identify any issues not covered and recommend actions needed to adequately address such issues. On the other assignment, we reviewed certain aspects of the Price-Anderson Act 1/ such as the adequacy of coverage, the appropriateness of particular provisions in the act relating to third-party liability, and the need for changes. Final reports on these ongoing assignments are scheduled for release soon.

SCOPE AND METHODOLOGY OF REVIEW

The Subcommittee concerns centered around the financial impact of the TMI accident on the GPU System and its ability to fund the clean-up costs, recommission TMI-2, and provide

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1/The Act was passed by Congress in 1957 and is in section 170 of the Atomic Energy Act of 1954. It provides for insurance coverage of up to $560 million for off-site personal and property damage claims resulting from a nuclear accident.

reliable service to customers without Federal funding or placing an undue burden on consumers. Therefore, we generally limited our financial analysis to actual data for 1978 and 1979 and projected data for the period 1980-84. In some instances, we used financial data extending back to 1970 for trend analysis purposes. Data used to assess reliability of service was generally projected through 1989.

Although each of the three operating companies functions as an independent utility, much of the administration, technical support, and documentation for their operations are maintained at the GPU Service Corporation headquarters at Parsippany, New Jersey. Consequently, almost all of our work with the companies was done at that location. We held numerous meetings with corporation officials and obtained and analyzed documents, reports, studies, rate filings, generating and load forecasts, and related data. In conjunction with the GPU staff, we developed the revenue requirements that would be needed to maintain a financially viable corporation under several different scenarios of generating capacity.

We also visited the TMI plant site and discusssed clean-up and restart problems with responsible GPU and Met Ed officials. We held discussions on power availability, purchases, and reserve margins for the next decade with the Pennsylvania-New Jersey-Maryland (PJM) power pool manager and ERA officials.

We obtained and analyzed reports and documents submitted by GPU and the operating companies to SEC regarding their financial status, and assessments made by the SEC staff. We also examined documents at FERC and the State commissions relating to rate filings and commission decisions and orders.

NRC's role and responsibilities in assessing the necessary changes required at TMI-1 to improve its operational safety were discussed with cognizant NRC officials. We also discussed with NRC officials the work being done by them as part of the restart proceedings to assess the financial ability of Met Ed to operate TMI-1.

Although we had to rely on GPU officials to provide estimated future financial data for scenarios, we used the services of two consultants to independently assess the validity of financial projections made by the corporation. The methodology used on one of our assessments--the rate of return on common equity--is discussed in detail in

Appendix III. We also used the corporate accounting, tax, and bankruptcy expertise of one of the consultants to assist us in our assessment of the strengths and weaknesses of the GPU System.

We did not assess (1) the validity of the estimated $420-450 million in clean-up recommissioning costs prepared by the Bechtel Corporation, (2) the probability that GPU will recover the full $300 million in insurance proceeds on TMI-2, or (3) the likelihood that GPU will recover any damages in its claim against the nuclear unit's manufacturer.

CHAPTER 2

GPU COMPANIES CONTINUE TO PROVIDE ELECTRIC POWER BUT COSTS ARE HIGHER

The loss of approximately 1,700 megawatts (MW) of nuclear-produced electric power from TMI-1 and 2 has left the GPU system with insufficient capacity to meet the basic needs of its customers. Interchange power from the PJM power pool and power purchases from utilities outside the PJM area, however, have thus far provided the GPU companies with sufficient power to meet all customer requirements. Reliable electric service may deteriorate in the future, however, if TMI-1 and 2 are not returned to service or if other generating capacity is not constructed.

The extensive reliance on interchange and purchased power has been costly to both the customer and to the utility companies. The incremental costs of replacement power for the two TMI units were about $295 million during the period April 1979-March 1980. Approximately $97 million of these costs had been charged to customers, with the balance of $198 million deferred for later recovery. Interest costs on the money in the deferred account currently amount to about $3.4 million per month, which traditionally has not been recoverable through customer rates.

AVAILABILITY OF POWER SUPPLIES IS NOT AN IMMEDIATE PROBLEM BUT COULD BE IN THE FUTURE

The relatively favorable generating capacity position held by the GPU companies at the end of 1978 quickly gave way to energy supply deficits with the forced shutdown of TMI-2 and the delayed restart of TMI-1. The accessibility to electric power from other utility companies through GPU's interconnected transmission systems has made it possible for customers to continue receiving adequate supplies of power.

Restart delays for TMI-1 and unmet construction schedules and/or cancellations of planned generating units, however, will require more extensive reliance on outside power supplies to meet expected customer demand during the rest of the decade.

Favorable operating characteristics of the GPU System - pre-1979

The operating companies in the GPU System operate as an interconnected power pool, with all of their power demands dispatched from the GPU dispatch control center in Reading, Pennsylvania. The System's reliance on fuels other than oil for generating electricity has worked to its advantage in containing power costs following the 1973 oil embargo. The generating mix used by the System prior to 1979 consisted of 34 percent nuclear, 57 percent coal, and 9 percent oil. Ownership of the units varies, with some powerplants, such as TMI, being jointly owned by all three of the companies. Other units, such as the Oyster Creek nuclear station, are wholly owned by one company. System companies may also operate generating units in which they share ownership rights with non-GPU utility companies.

In addition to Penelec, Met Ed, and Jersey Central forming the GPU System, each company is a member of the PJM Interconnection or power pool. The purpose of PJM is to provide, through contractual agreement among the members, the service, reliability, and economy that would result if the Interconnection were one company while recognizing individual company constraints. Along with the GPU companies, Philadelphia Electric Company of Pennsylvania, Pennsylvania Power and Light Company, Baltimore Gas and Electric Company of Maryland, and the Potomac Electric Power Company (serving parts of Maryland, the District of Columbia, and Virginia) are members of PJM. Atlantic Electric, Delmarva Power Company, and United Gas & Illuminating Company are associate members.

PJM member utilities are required to provide sufficient generating capacity to meet their basic system requirements (load and reserve) or pay a penalty for undercapacity. However, they are all interconnected through an extensive transmission network and have all of their generating capacity centrally dispatched from the PJM control center in Valley Forge, Pennsylvania. Under PJM's economic dispatch concept, the lowest-operating cost units for the system as a whole are generally put on line first. For generating capacity purposes, PJM considers the three GPU operating companies as one utility.

As demand increases, the next-lowest-price unit within the system is brought into operation, regardless of which member has the demand or which member has the generating unit. The savings that result are divided evenly between the member purchasing the power and the member selling the power under a "split savings" concept.

PJM membership can further benefit utilities and their customers because their interconnections allow each company to operate with a lower reserve margin 1/ than if they operated separately. Currently the PJM system-wide reserve margin requirement is 22 percent. The projected 1980 reserve margin is approximately 28.5 percent--exclusive of TMI-1 and 2--which reflects an excess of capacity over expected system demands.

In addition to the generating facilities of its members, the PJM system is interconnected with other adjacent systems that can provide supplementary electric power in the event of (1) unusally heavy demand (2) an accident on the PJM system, or (3) the ability of adjacent systems to deliver power at less cost than the PJM system. PJM has twenty-seven interconnections with utilities external to its members' service areas. Twenty of these twenty-seven interconnection points are located within the GPU System. This situation has not only enhanced GPU's importance to PJM, but it has allowed GPU to negotiate directly with these other utility systems for power supplies without using PJM-member facilities. In addition to the interconnections, the GPU dispatch control center in Reading, Pennsylvania, serves as one of PJM's dispatch center back-up systems in the event of an emergency outage at the Valley Forge control center.

The GPU subsidiaries are also members of the Mid-Atlantic Area Council (MAAC), one of the nine regional reliability councils established after the 1965 blackout in the New England area. MAAC's basic membership is the same as PJM's plus a few rural electric companies, municipals, and small investor-owned companies operating in the general area. While PJM is concerned with the day-to-day operation of the system, MAAC's purpose is to evaluate system reliability in planning capacity needs by reviewing each company's plans to ascertain whether they meet MAAC reliability standards. This planning for future needs is important because of the length of time it takes to bring a new generating facility into operation. In some cases the time period can extend to 10 years or more from planning to commercial operation.

GPU's own plans prior to the TMI accident provided for the addition of three major generating units. The

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1/Additional generating capacity, above peakload demands, available to meet unplanned disruptions to service, usually given in percent.

largest, a 1,120 MW nuclear facility at Forked River in New Jersey, was scheduled to go into operation in 1983. Two 625-MW coal units in Pennsylvania, Seward 7 and Coho 1, were scheduled for completion by 1987 and 1989, respectively.

Current generating capacity and peak demand

As previously mentioned, PJM has set a planning reserve margin requirement of 22 percent for the total system. However, each company is given its own individual planning reserve margin requirement. The GPU System's reserve margin is 24 percent. Prior to March 1979, GPU's projection for the 1980 summer showed that the company anticipated having a system reserve of 27 percent--including TMI-1 and 2. The company projected that Penelec and Met Ed would have reserves in excess of 35 and 50 percent, respectively, and although Jersey Central would only have a 2.5-percent reserve margin, the combined GPU system reserve margin would be sufficient to meet PJM requirements.

As a result of the accident involving TMI-2, however, and the continued shutdown of the undamaged TMI-1 unit by the Nuclear Regulatory Commission, both Jersey Central and Met Ed would be extremely unreliable systems at the time of the expected 1980 summer peak demand without their outside interconnections. Penelec, however, even with the removal of the TMI-1 and 2 capacity, is projected to have a 28.4-percent reserve margin. Penelec's reserve margin theoretically enables the system to be only 11 MW short of being able to meet its 1980 summer peak. This ability to nearly meet the expected summer peak does not mean, however, that the System's own generating capacity is adequate since reliable service implies a reserve margin of about 20-25 percent above peak demand. Using GPU's reserve margin requirement of 24 percent, the System will be short about 1,468 MW of capacity at the time of the summer peakload.

The GPU System, however, should have no problem in meeting its peakload for 1980. Currently, GPU has firm contracts for 440 MW of outside power: 200 MW from Ontario Hydro in Canada, 200 MW from Pennsylvania Power and Light Company, and 40 MW from Jamestown, New York. GPU has also been purchasing over 1,000 MW of power from utilities to the west of the system on an as-available basis. In addition, the PJM Interconnection is expected to have more than enough capacity through the summer of 1980 to meet the needs of all its members--even without TMI-1 and 2. As shown in the following table, PJM projects an overall 28.5-percent

peakload reserve margin, which does not include GPU's outside purchases.

PJM Projected Capability and Demand--(Summer 1980)

Reported capability	44755
Less TMI-1 and 2	1656
Remaining Capacity	43099
Pool Peak Demand	33550
Reserve Margin (28.5%)	9549

Source: Mid-Atlantic Area Council (MAAC) "Coordinated Planning Report," prepared for DOE. For purposes of this analysis the difference between MAAC and PJM is not significant.

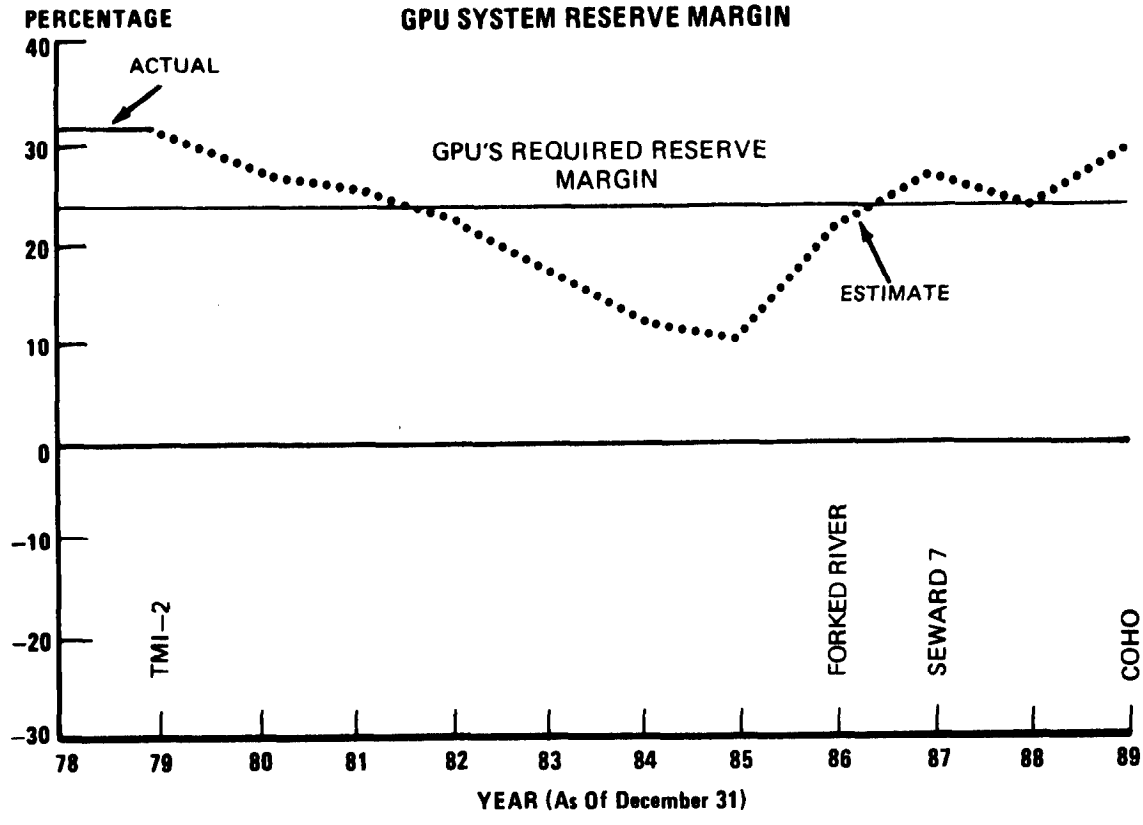
Projected System reserve margins are not favorable

The availability of power purchases and interchange with PJM is critical to the System's ability to continue providing reliable service at least until 1985 and possibly beyond. GPU suspended all construction on the Forked River nuclear plant and the Seward 7 coal plant immediately after the TMI-2 accident. GPU does not plan to resume construction on the Forked River plant in the near future. Work on Seward 7 could resume if finances were available. To provide some relief from its capacity shortage and lessen its reliance on purchased power, GPU is attempting to enter into a contract with Ontario Hydro to construct a direct current intertie under Lake Erie. Ontario Hydro would supply 1,000 MW of power to the System annually through 1991. However, completion of this transmissioh line and converter stations is not expected before 1985.

To understand the effect the TMI-2 accident had on the System's future generating capability, we first examined GPU's planned expansion program for the 1980s and then developed three scenarios to illustrate the effects on reserve margins of constructing or not constructing certain of the planned generating units. Our analysis of the System's actual and planned capacity and expected peakload requirements demonstrates the weak position the System is in with respect to assuring customers reliable power supplies and what is needed to restore system reliability.

Projected System reserves
prior to TMI-2 accident

The following graph shows how the System had planned to meet customer demand and maintain a reliable system.



SOURCE: GPU Corporation.

In this graph and the succeeding ones, the GPU System reserve margin is shown because of the interconnected operations of the three companies through the System's central dispatch office. The line depicting GPU's required reserve margin of 24 percent reflects the PJM requirement.

Although the companies operate as an integrated system, generating capacity ownership is by individual company, and therefore each company has its own reserve margin as a measure of meeting its own load requirements. Under the planned capacity additions for the System through 1989, Penelec would maintain a reserve margin of 30 percent or more. Met Ed's margin would be 42.7 percent in 1979, but this would decline to 20 percent by 1984 and continue down until the Coho plant was completed in 1989. Jersey

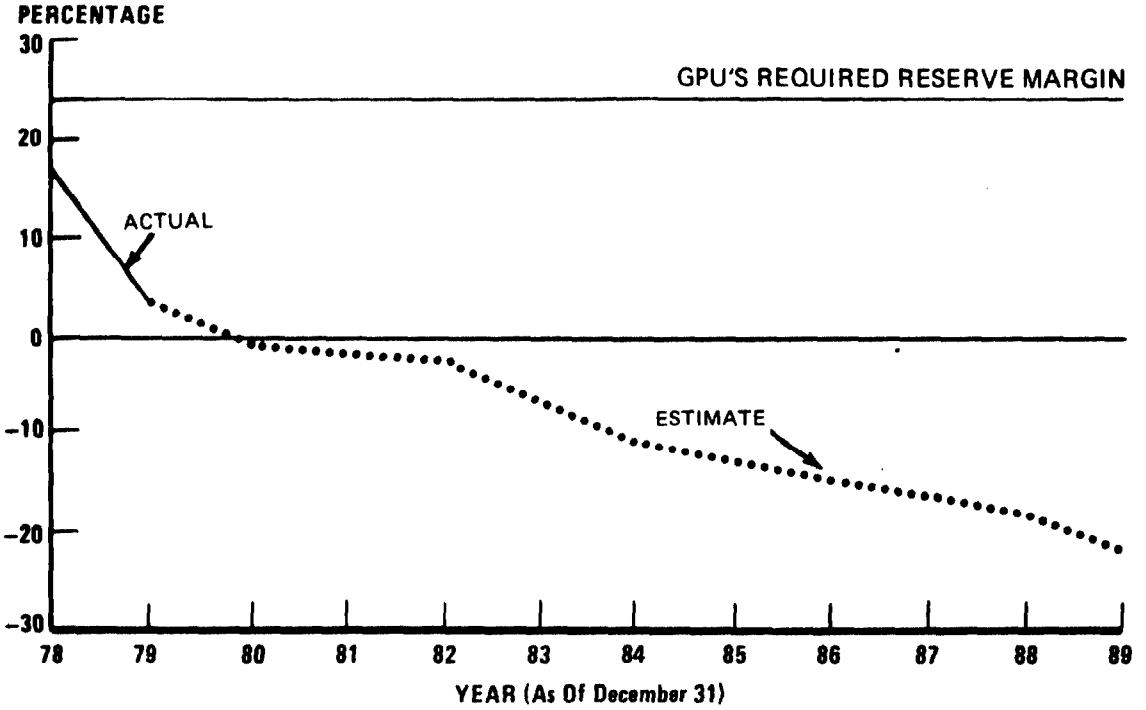
Central would remain below 20 percent even with the Forked River and Coho plants coming on line as scheduled.

Projected reserves as a result of changes required by the TMI-2 accident

The loss of TMI-1 and 2 and construction delays at Forked River and Seward 7 have added a large element of uncertainty to future System reliability. We have constructed three scenarios to assess the possible effects of this uncertainty. In each scenario, we have used currently available net generating capability of the System and its projected summer peakload for each year. According to GPU officials, peakload forecasts do not incorporate the potential effects of a strong conservation and load management program now being developed by the company. This program could reduce system demand by 1,000 MW by 1990.

Scenario 1--This scenario is the most extreme, projecting the abandonment of both TMI-1 and 2 with no new capacity added by any of the companies.

SCENARIO 1

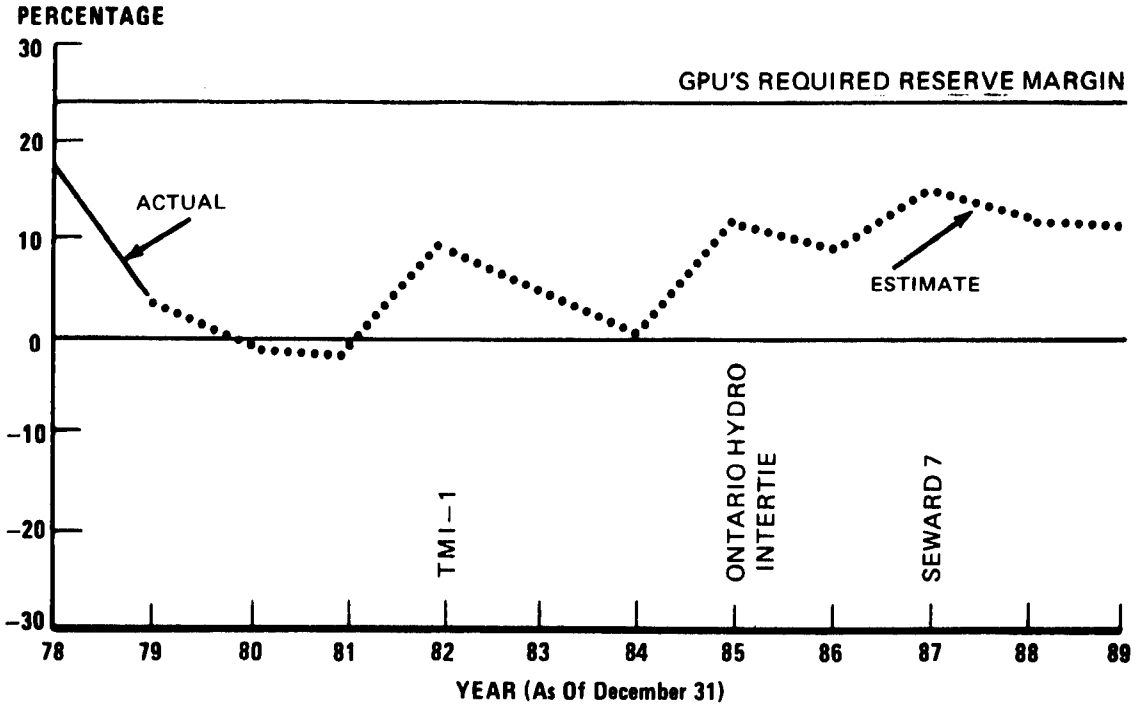


SOURCE: GPU Corporation and DOE.

Under this scenario,Penelec would be the only company with a reserve margin above zero. Met Ed and Jersey Central would essentially be distribution companies with extensive reliance on purchased power to meet customer needs.

Scenario 2--This scenario assumes that TMI-1 will return to service in 1982, the Ontario Hydro intertie will be completed by 1985, and Seward 7 will be in service by 1987.

SCENARIO 2

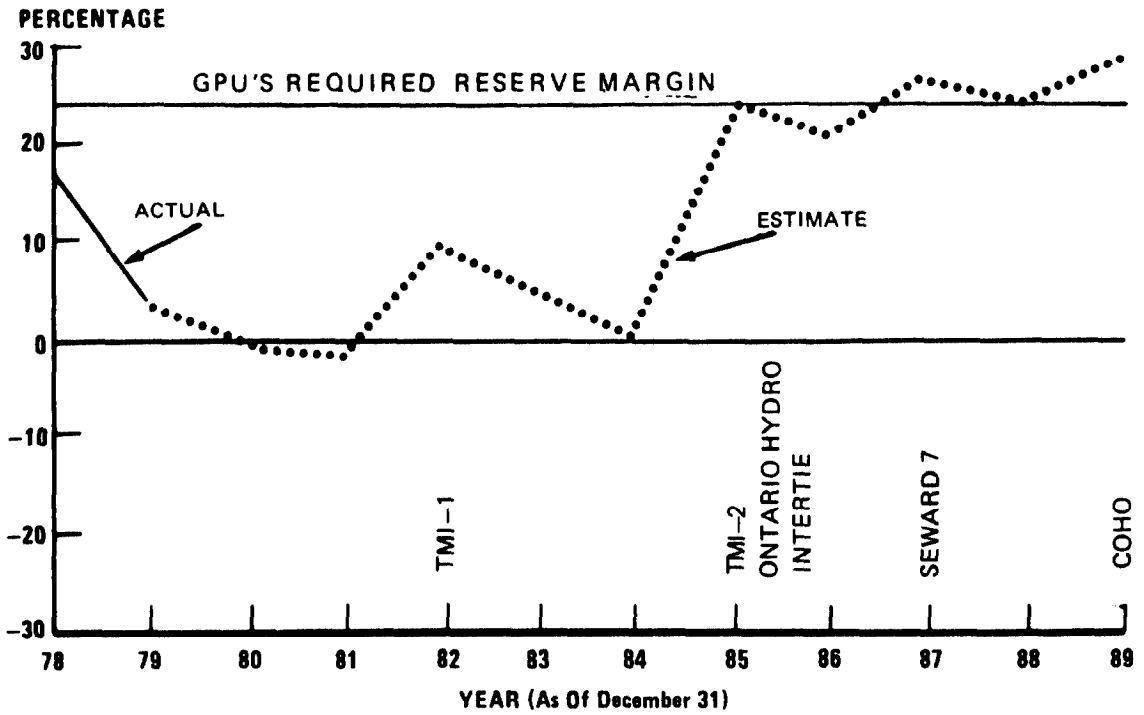


SOURCE: GPU Corporation and DOE.

These projected capacity additions would keep Penelec's reserve margin above 20 percent. Met Ed's margin would remain negative. Jersey Central's margin would reach 13 percent in 1985 and then decline to about 2 percent by 1989.

Scenario 3--This scenario more nearly reflects the System's original plan for meeting load requirements except for a 5-year delay in adding sufficient generating capacity to attain an acceptable reserve margin. We assume TMI-1 returns to service in 1982 with both TMI-2 and the Ontario Hydro intertie in service by 1985. Completion of Seward 7 is expected by 1987 and Coho by 1989.

SCENARIO 3



SOURCE: GPU Corporation and DOE.

Even under this optimistic scenario, neither Met Ed nor Jersey Central will reach a reserve margin of 20 percent although the margins will be positive after 1985. Penelec would continue to be the strongest company, with reserve margins substantially above the 20 percent level.

PJM reserve margins are expected to be sufficient to meet demand

PJM would remain a strong, viable system even if events postulated in scenario 1 happened. Under the circumstances of scenario 1, PJM would have a reserve margin of at least 25 percent until 1989, when it would slip to 24 percent--2 percentage points above the reserve margin requirements its members have set for themselves. However, it should be noted that reserve margin projections used by PJM are the best estimates of its members. It is possible that construction slippages could, at some point in time, put PJM below the 22-percent reserve margin. One such occurrence would be a nuclear moratorium. Another is the possible curtailment of electricity produced by coal because of EPA air quality restrictions.

ADDITIONAL POWER PURCHASES HAVE RAISED OPERATING COSTS

The relatively low-cost electric power generated by the TMI nuclear units and provided to customers by the GPU System has been largely replaced by more expensive power obtained from the PJM interchange or purchased directly from utility systems with capacity in excess of their own needs. The availability of power to the System from non-PJM sources at considerably lower cost than is available throughout the PJM Interconnection has resulted in substantial savings to utility customers. Customers were initially benefitted by the reluctance of the Pennsylvania and New Jersey State Commissions to pass on the full costs of replacement power as they were incurred by the companies. As power purchases continue, consumer rates will have to increase as the utilities are allowed to recover both current costs and an amortized portion of the large deferred energy balances accumulated by the companies.

Pre-accident rates reflected relatively low-cost power generation

Electric rates charged to customers are a composite of a number of costs incurred in producing a kilowatt hour (Kwh) of electricity. Operation and maintenance (O&M) costs, including fuel costs, are the largest component of total costs. To the O&M costs are added items such as taxes, depreciation expenses, interest on debt and preferred dividends, and a return on capital investments. Since fuel costs are a major item of O&M expenses, a reduction in

these costs lowers rates charged to consumers. Hydroelectric plants produce the least expensive power because no fuel costs are involved in producing the electricity. Nuclear fuel, coal, gas, and oil follow in order of increasing costs. The GPU System's heavy dependence on nuclear and coal-fired generation worked to the advantage of its customers, particularly as the price of oil increased after the 1973 oil embargo. For the period 1975-1978, the GPU System generated power at the following fuel costs:

Year	Average fuel cost	Type of fuel			
		Nuclear	Coal	Gas	Oil
	(mills per Kwh)				
1975	9.4	2.4	10.4	16.4	27.0
1976	9.3	2.0	10.5	16.4	26.1
1977	10.2	2.1	11.2	22.8	29.7
1978	11.2	2.3	13.2	27.6	28.6

Source: GPU Corporation.

In addition to using internally generated power, utility companies normally purchase or interchange electric power under a number of differing situations--when the purchase price is less than the utility's own production costs, when additional power is needed to meet peak demands, and when the utility has insufficient capacity of its own to supply customer needs. GPU, for example, routinely interchanged through PJM varying amounts of power. During the period 1975-1978, the following amounts of net power interchanges were reported by GPU.

Year	Total cost of interchange power ($, millions)	Cost per Kwh (mills)	Percent of total bill from interchange power
1975	$ 52.3	20.4	5.5
1976	120.8	22.0	11.5
1977	186.2	31.4	15.2
1978	133.7	31.3	10.3

The net result to consumers has been generally lower average costs than those paid by customers of neighboring utilities. As shown in the following table, Jersey Central's costs were eighth lowest out of 13 utilities and only three utilities had lower average costs than Penelec and Met Ed in 1978.

Table 2-1

Average Cost to Customers
Twelve Months Ended December 1978
(in ¢ per Kwh of sales)

Company	Cost
Consolidated Edison Co. of New York	8.14
Rockland Electric Co.	6.85
Long Island Lighting Co.	5.73
Public Service Electric & Gas Co.	5.33
Atlantic Electric Co.	4.74
Jersey Central Power & Light Co.	4.72
Duquesne Light Co.	4.53
Philadelphia Electric Co.	4.47
Pennsylvania Electric Co.	3.83
Metropolitan Edison Co.	3.80
Pennsylvania Power & Light Co.	3.53
Pennsylvania Power Co.	3.31
West Penn Power Co.	3.18

Source: GPU Corporation.

The post-accident need for purchased power increased company operating costs

The loss of generating capacity from taking TMI-1 out of service for refueling in January 1979 was offset by the entry into commercial service of TMI-2 beginning December 30, 1978. The subsequent loss of TMI-2 on March 28, 1979, however, and NRC's order to keep TMI-1 shut down even after the refueling was completed required that the operating companies increase their purchases/interchanges of power to meet customer demands for electricity. For 1979, the System's net purchases/interchanges increased to about $268 million, or more than double the amount for 1978. Of this $268 million, nearly $223 million was purchased/interchanged between April and December 1979. Fortunately, the companies were able to buy nearly two-thirds of the necessary power from systems outside PJM at considerable savings, as shown below.

Source of purchase	Total price paid	Number of Kwh purchases	Average cost per Kwh
	------(millions)------		(cents)
PJM	$ 96.7	2,408	4.02
Outside PJM	126.2	4,259	2.96
Combined	222.9	6,667	3.34

Source: GPU Corporation.

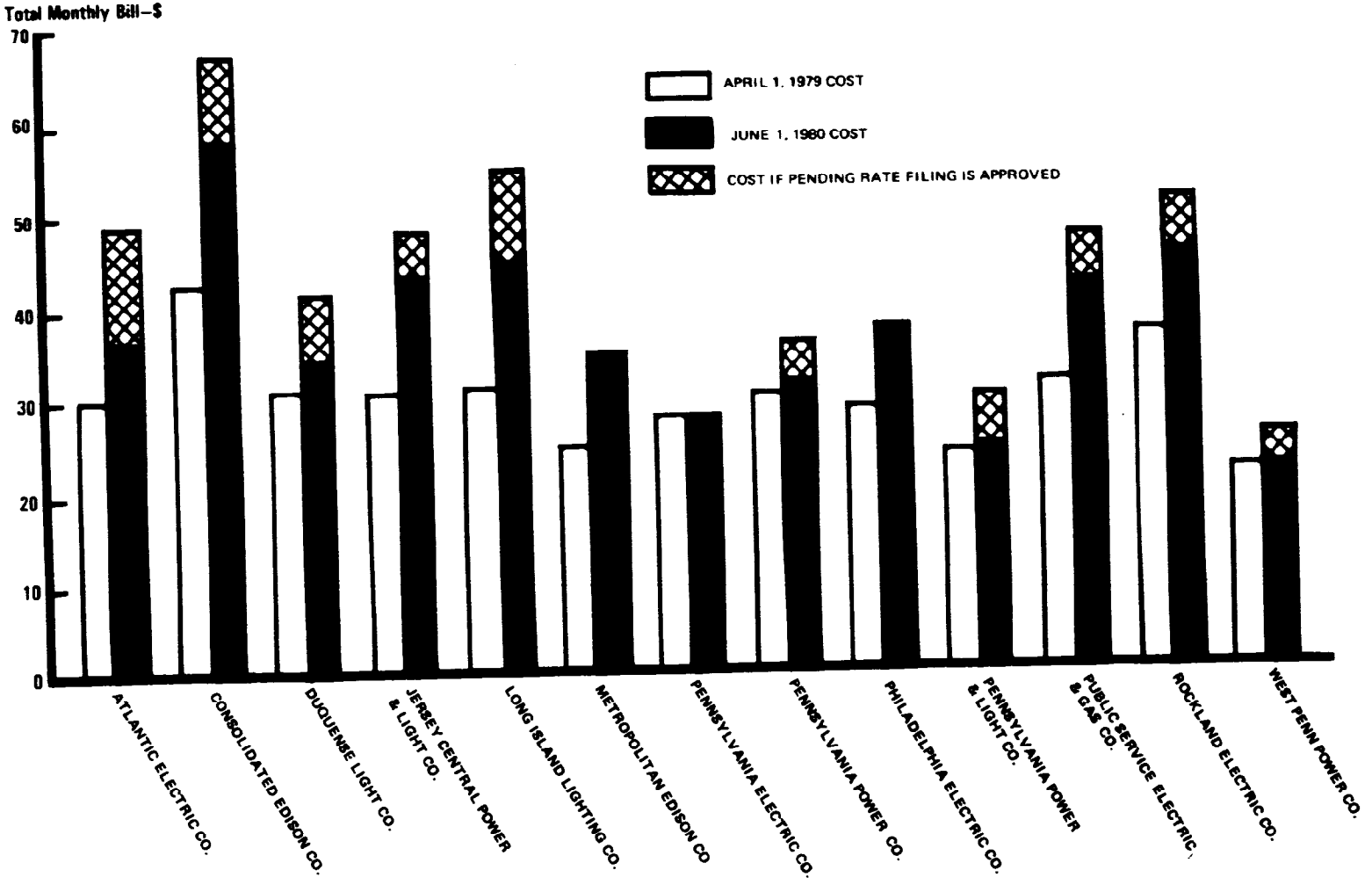
Because of purchases from non-PJM sources, this cost was nearly $45 million less than it would have been if all replacement power had been obtained from the PJM interchange under the current split savings rate schedule. Through March 1980, an additional savings of $46 million was made by increasing System purchases from outside PJM.

GPU has estimated that 1980 replacement power costs for TMI-1 and 2 will be about $325 million, or an average of $27.1 million per month. At least two factors, however, could significantly affect this cost estimate. GPU officials said that customer demand during January-March 1980 was the same as in the first quarter of 1979 and this is lower than had been anticipated when the 1980 cost estimate was prepared. If this zero growth level holds during the year, less power will be needed for the System and purchases could be reduced below the estimate for the year. In addition, there are indications that the current recession is affecting consumer demand in utility service areas to the west of the GPU System. As a result, more power from less expensive coal-fired generation may be available than was anticipated, and this in turn should reduce purchased power costs.

Despite the fact that the GPU System has had to purchase/interchange substantial power to replace the loss of the TMI-1 and 2 generating capacity, the cost of electricity to its customers has remained in the range of other utilities in the region. This is true primarily because the companies have not been allowed to pass on to their customers immediately the full amount of the higher-cost power. The rate increases granted by the State regulatory agencies prior to April 1, 1980, have largely reflected

energy clause adjustments that were not TMI-related or were offset by the removal of TMI-2 from the rate base. For example, the New Jersey Board of Public Utilities granted Jersey Central $234 million in rate increases during the year following the accident. Only 34 percent of the total rate increase was TMI-related. The following chart compares, for April 1, 1979 and June 1, 1980, typical electric bills for a residential customer purchasing 500 Kwh of electricity per month from various neighboring electric utilities. It also shows, as of June 1, 1980, the rate increases filed by electric utilities and what the new rates would be if the increases are approved. Although Jersey Central rates are on the high side, rates for Met Ed and Penelec are still favorable when compared to those of most other companies.

TYPICAL ELECTRIC BILL COMPARISONS RESIDENTIAL–NO WATER HEATING–500 KWH/MONTH



SOURCE: GPU Corporation.

CHAPTER 3

SOME ACCIDENT-RELATED FINANCIAL PROBLEMS ARE BEING RESOLVED BUT LONGER RANGE UNCERTAINTIES REMAIN

The nuclear accident at TMI-2 left the GPU System with a number of serious financial problems and uncertainties. The normal financing methods used by the utility companies have been disrupted, including the intercorporate flow of funds between GPU and the operating companies and ready access to the capital markets for financing ongoing operations.

The GPU System was also faced with a number of regulatory uncertainties with regard to the recovery of certain operating costs that normally would not present difficulties for the System. State utility commissions are currently resolving some of the cost issues that have been adversely affecting System finances, but these primarily involve only short-term problems. Decisions affecting the future of the TMI units, and their impact on the future System finances, are still pending at NRC.

The favorable State utility commission decisions on rate relief for the operating companies have alleviated the serious cash flow problems experienced by Met Ed and Jersey Central since the accident. Although the potential for bankruptcy has been diminished, the loss of earnings capability by the companies still leaves the future viability of the System in question. GPU estimates of capital financing to maintain and improve the existing transmission and distribution system, add a minimal amount of additional capacity, and clean up and recommission TMI-2 show a need for nearly $4 billion by 1987. To achieve that goal, the system will need regulatory approval to recover current costs, expedited approval to restore TMI-1 and 2 to service, and a sufficient increase in earnings to restore its credibility with the investment community so that access to the capital markets can be renewed.

GPU SYSTEM ORGANIZATION PROVIDES INTERCORPORATE FINANCING

Jersey Central, Met Ed, and Penelec operate financially as three separate companies, but within the overall direction and control of GPU as the parent company. Certain

specialized services that are common to all companies, such as planning, engineering, power pooling, and regulatory rate filings are provided by the GPU Service Corporation on a cost reimbursable basis. The companies are regulated by the State utility commissions as independent companies, and rates to cover the costs incurred in providing electric power to each company's service area are based on individual company rate filings.

Financing construction costs is a company responsibility. Each of the companies carries its own short-term borrowings and issues its own bonds and preferred stocks to outside investors. All of their common stock, however, is owned by GPU, with none of it being publicly traded.

The $1.4-billion investment in the common stock and consolidated surplus of its three operating subsidiaries represents all of GPU's material assets as a holding company. The dividends paid by the three companies are essentially its only income. GPU does issue its own common stock and at the present time has 61.3 million shares outstanding. Since GPU has no material assets other than operating company stock, the market price of its stock is a reflection of the financial strength of the companies as a whole.

The operating companies normally pay over 90 percent of the net income after taxes, interest, and preferred dividends to GPU in the form of dividends, leaving little of the earnings for company use.

After stock dividends are paid, GPU redistributes its net earnings to the operating companies as needed through capital contributions. Since 1970, the companies have paid dividends to GPU amounting to $1.046 billion and have received back through capital contributions $733 million. The following schedules show these dividend payments and capital contributions by company and year.

Dividends paid

Year	Jersey Central	Met Ed	Penelec	Total
	($, millions)			
1970-74	$182.5	$129.9	$151.3	$ 463.7
1975	36.7	37.8	39.7	114.2
1976	50.0	39.5	37.7	127.0
1977	63.7	49.0	37.0	149.7
1978	57.0	48.0	37.0	142.0
1979	12.0	7.0	30.0	49.0
Total	$401.9	$311.2	$332.5	$1,045.6

Capital contributions

Year	Jersey Central	Met Ed	Penelec	Total
	($, millions)			
1970-74	$179.8	$218.7	$ 89.0	$487.5
1975	13.0	-	4.14	17.14
1976	40.0	-	30.05	70.05
1977	40.0	-	45.0	85.0
1978	44.0	-	-	44.0
1979	29.5	-	-	29.5
	$346.3	$218.7	$168.19	$733.19

Source: GPU Corporation.

The large capital contributions made to Met Ed during the 1970-1974 period increased Met Ed's common equity ratio (common stock plus consolidated surplus divided by total capital) to 42 percent. In line with GPU's policy of maintaining the operating companies' common equity ratios at about 33-34 percent, all capital contributions were withheld during the 1975-1979 period. At December 31, 1979, Met Ed's common equity ratio was 36 percent.

PRE-ACCIDENT FINANCIAL CONDITION OF THE GPU SYSTEM WAS SOUND

Although the financial soundness of each of the three companies varied, the consolidated pre-accident financial position of the GPU System appeared to be favorable. An official of the SEC testified before a Senate Subcommittee 1/ and NJBPU that, prior to the TMI-2 accident, the GPU companies were soundly capitalized. During recent hearings held by PaPUC, witnesses from a management consulting firm engaged by the Commission to conduct a management audit of the GPU companies stated that "Prior to the accident, the company was prudently capitalized and its financial position was strong and improving."

Our analysis of the Corporation's financial statements for the period 1975-1977 shows that a steadily increasing earnings picture existed with commensurate increases in GPU common stock dividend payments. GPU's common stock was selling for about $20 per share in the market and the companies' bond and preferred stock ratings were reasonably good. The $742 million investment in TMI-2 was completed, and the unit was placed into commercial service on December 30, 1978. Utility commission approval to allow the TMI-2 costs in the companies' base rates was expected and this would further improve the earnings picture.

The financial picture for the individual companies was not quite as positive as the consolidated outlook. At the end of 1978, the companies were carrying about $103 million in their deferred energy accounts. This resulted primarily from State commission orders changing the State regulation of energy adjustment clauses. Rather than immediately

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1/Hearings held by Subcommittee on Nuclear Regulation, Senate Committee on Environment and Public Works, Nov. 8 and 9, 1979.

pass on to customers the full cost of these energy cost adjustments, the commissions deferred some of these costs for recovery in later periods. These amounts varied by company.

Jersey Central was probably in the least favorable financial position of the three companies. Much of the company's generating capacity relies on oil and natural gas and during the period of rising oil prices the company had been struggling to maintain a good financial position. In addition to the 25 percent investment in TMI-2, Jersey Central was constructing the Forked River nuclear plant on its own. About $350 million of its funds tied up in that project were not included in its rate base and consequently were not receiving a current cash return.

THE TMI-2 ACCIDENT AND SUBSEQUENT REGULATORY ACTIONS CHANGED COMPANIES' FINANCIAL POSTURE

The commercial phase-in of TMI-2 on December 30, 1978, offset the refueling shutdown of TMI-1 in early January 1979. This left the System's generating capacity relatively unchanged during the first quarter of 1979 but did portend increased earnings as NJBPU and PaPUC took steps to include the TMI-2 costs in the companies' base rates. The March 28, 1979 accident at TMI-2 and the continued shutdown of TMI-1, however, resulted in adverse changes not only in the System's power production capability but in its financial condition as well. These changes primarily lowered the cash flow, earnings posture, and interest coverage of the companies and were to a large extent influenced by the actions of the regulatory agencies following the accident.

Increased cash requirements posed immediate problems

The changes in the System's cash flow and short-term debt posture have come largely from the need to buy large quantities of replacement power due to the loss of the TMI units. As we discussed in chapter 2, the needed power was immediately available through the System's ties to the PJM Interconnection, and subsequent supplies were obtained from other utility companies. As was also discussed, this replacement power was obtained at a much higher cost than what had been estimated when the System rate schedules for 1979 were prepared. GPU officials stated that the basic

cause for the increase is the differential between nuclear fuel costs and coal and oil fuel costs. They said for the TMI units, the fuel costs in 1979 were expected to be about 4 mills per Kwh. In contrast, coal costs equate to about 12 mills per Kwh and oil costs about 48 mills per Kwh.

Because all of the replacement power came from either coal- or oil-fired generation, the company rates chargeable to customers covered very little of the actual replacement power costs. The large quantity of power needed and the substantially higher prices paid versus System-generated power costs put a severe strain on the cash position of the companies.

Although the cost of replacement power has been the single largest cash flow effect of the accident on company finances, other unanticipated cash demands were triggered by the accident. Extensive clean-up costs at TMI-2 have already been incurred by the companies. As of April 1, 1980, about $120 million has been spent for this purpose. About $96 million of this has been recovered from insurance proceeds, but the timing of cash payments and receipts is not always the same. Safety-related changes for TMI-1 have also required cash resources which are not covered by insurance proceeds and are not recovered in current rate schedules.

An adequate cash flow is important to a utility company if it is to remain solvent. Cash flow is dependent on two external constraints--availability of bank borrowing and rate regulation--over which the utility has little influence. Unlike many businesses that can immediately reflect their production costs and a profit margin when the product is sold, electric rates are affected by a time lag--whether regulatory or mechanical--that represents a mismatching of current costs and revenues. These unrecovered costs are held in a deferral account for later recovery through customer rates. Utility payment for these incurred, but uncollected, costs are normally covered by a cushion of internally generated funds or by short-term bank borrowings. Substantial increases in unanticipated expenses, such as those resulting from the TMI accident, can quickly reduce the cushion of available funds. The only recourse then is prompt regulatory rate relief or increased bank borrowings, if available. If neither of these is available and current cash requirements exceed current cash receipts, the alternative is insolvency.

Continued earnings are important for future financial viability

Closely allied to a utility's cash flow is its earnings capability. A company needs to collect not only enough revenues to meet its current O&M expenses, interest, and tax liabilities, but also a return on its invested capital. This is a critical factor in ensuring its continued ability to provide the necessary power supplies to its customers. The GPU System, like other utilities, relies heavily on outside investors for funds to build generating powerplants and related facilities. Unless the companies have sufficient earnings to repay the borrowed funds and pay dividends to stockholders on their investment, these external sources of funds will dry up.

Investors in utility stocks and bonds assess the relative risks of owning one company's securities versus those of other similar companies. An unusual event,such as the TMI accident with its attendant uncertainties as to recovery costs and their effect on the GPU System, increases the risks for investors. This perceived increase in risk for the GPU System securities was noted immediately by the Moody's rating service and subsequently by the Standard & Poor's rating service. Table 3-1 lists the quality ratings by Moody's for the operating companies' securities as they stood on March 28, 1979, together with the changes that have occurred since then. At the time of the accident, all but one of the companies' securities had a "Baa" or better rating. A "Baa" rating represents a medium grade security which is considered to be neither highly protected nor poorly secured. A "B" rating represents a lack of desirable investment characteristics.

TABLE 3-1

Moody's Quality Ratings Of GPU Securities (note a)

	3/28/79	4/19/79	6/29/79	3/28/80
Jersey Central				
Bonds (note b)	Baa	No change	No change	Ba
Debentures	Ba	No change	No change	B
Preferred	"baa"	No change	No change	"b"
Met Ed				
Bonds (note b)	A	Suspended	Baa	B
Debentures	Baa	Suspended	Ba	B
Preferred	"a"	Suspended	"ba"	"b"
Penelec				
Bonds (note b)	A	Baa	No change	Ba
Debentures	Baa	Ba	No change	Ba
Preferred	"baa"	"ba"	No change	"b"

a/Definition of Moody's rating symbols contained in app. II.

b/Includes pollution control bonds.

Source: Moody's Public Utility Manual.

As a result of decreased earnings capability, the GPU companies have been unable to meet the legal interest coverage requirements necessary to issue bonds and preferred stocks. This situation may change with the current rate increases, but most purchasers appear unwilling to invest in a utility system whose current and future financial viability is in question. Until such time as the System's rate of return and earnings potential improves to the point where the perceived investment risk is substantially decreased, the availability of external capital financing remains an uncertainty.

Regulatory agencies' actions have affected cash flow and earnings

Actions taken by the Pennsylvania Public Utilities Commission and the New Jersey Board of Public Utilities

have had the most direct impact on the present financial position of the System. To date, extensive rate relief given to Jersey Central by NJBPU has materially improved its cash flow position. Only about one-third of the approximately $300 million increase, however,is related to the TMI units. PaPUC has also responded to Met Ed's and Penelec's problems. A May 23, 1980, final decision with respect to recovering deferred energy costs will improve these companies' cash positions. The longer range earnings picture has not been helped, however, by the States' decision to take the investment and other costs of both TMI-1 and 2 out of the utilities' rate base.

The extended schedule of NRC prior to the restart of TMI-1 has exacerbated the companies' cash flow and earnings problems. FERC's rate action on the companies' filings for wholesale sales rate increases was positive, although by using the settlement procedure rather than the hearing process, some of the issues concerning rate treatment of TMI-1 and 2 were not addressed.

State utility commission actions

During the 14 months following the accident, NJBPU granted Jersey Central over $300 million in rate increases, most of it under its Levelized Energy Adjustment Clause (LEAC). 1/ Only one-third of this amount, however, was related to replacement power costs for TMI units. The remaining two-thirds was granted to Jersey Central to cover the higher costs of fuel for its own generating units and for non-TMI-related power purchases.

After initially allowing TMI-2 investment costs in the rate base by its order of January 31, 1979, NJBPU took the following actions after the accident on March 28, 1979.

1/A regulatory process used to adjust consumer rates as a result of fluctuations in fuel costs.

Jersey Central Power & Light Company

Date	NJBPU action taken	Amount allowed (rescinded) ($, millions) 1979	1980	1981
1/31/79	Increased base rates ($33.8 million annually)	$31.0	$33.8	-
6/18/79	Increased LEAC for TMI replacement power costs ($112.5 million over 18 months)	37.5	75.0	-
	Reduced base rates by removing TMI-2 costs ($29 million annually)	(14.5)	(29.0)	($14.5)
9/05/79	Increased LEAC for non-TMI related energy costs ($70 million over 12 months)	23.3	46.7	-
3/06/80	Increased LEAC for non-TMI related energy costs ($84.2 million total)	-	70.2	14.0
4/01/80	Increased TMI-related energy costs ($34.2 million total)	-	28.0	6.2
	Reduced base rates by removing TMI-1 costs ($17.9 million annualized)	-	(13.4)	(8.95)
	Increased recovery of pre-accident deferred energy costs of $51.4 million at $1.5 million/month until TMI-1 is restarted	-	13.5	9.0
5/13/80	Interim increase to base rates ($60.0 million annualized) (note a)	-	35.0	30.0
	Net rate recovery allowed--1979	$77.3		
	TMI energy cost recovery--1979	$37.5		
	Net rate rcovery allowed--1980		$259.8	
	TMI energy cost recovery--1980		$103.0	
	Rate recovery allowed through June 1981			$35.75

a/ This does not include the potential ruling on the remaining $113.5 million.

PaPUC has responded to the needs of Met Ed and Penelec in a manner similar to that of NJBPU for Jersey Central. After initially allowing the companies' investment in TMI-2 to go into rate base, the Commission rescinded its order shortly after the accident and effectively negated planned increases in rate revenues. Subsequent commission actions, as shown below, were concerned with both replacement power cost-recovery allowances and a further reduction in base rates by the removal of TMI-1.

Metropolitan Edison Company

Date	PaPUC action	Amount allowed (rescinded) ——$, millions)—— 1979	1980	1981
6/19/79	Reduced base rates for TMI-2 cost ($3.0 million annually)	($ 1.5)	($ 3.0)	($1.5)
	Increased LEAC for replacement power costs for TMI units ($44.6 million annually)	22.3	44.6	-
	Recovery of pre-accident deferred energy charges ($3 million annually)	1.5	3.0	1.5
2/08/80	Increased LEAC for TMI replacement power costs ($55 million annually) (note a)	-	45.8	-
5/23/80	Reduce base rates by removing TMI-1 ($26.9 million annually)	-	(13.45)	(13.45)
	Increased LEAC for TMI replacement power costs $26.9 annually)	-	13.45	-
	Recover $84.6 million deferred energy cost balance as of 2/28/80 over 18 months. ($74.9 TMI-related)	-	32.9	28.2
Net rate recovery allowed—1979		$22.3		
TMI energy cost recovery—1979		$22.3		
Net rate recovery allowed—1980			$126.3	
TMI energy cost recovery—1980			$119.5	
Rate recovery allowed through June 1981				$14.75

a/ Confirmed and made final by May 23, 1980 order.

Pennsylvania Electric Company

Date	PaPUC actions taken	Amount allowed (rescinded) ($, millions) 1979	1980	1981
1/27/79	Increased base rate ($56.2 million annually)	$51.5	$56.2	28.1
4/25/79	Reduced base rates by removing TMI-2 ($25 million annually)	(16.7)	(25.0)	(12.5)
4/19/79	Reduced base rates by removing additional TMI-2 costs ($1.6 million annually)	(0.8)	(1.6)	(0.8)
	Increased LEAC for TMI replacement power costs ($36.1 million)	18.0	36.1	-
	Recovery of deferred energy charges ($1.6 million annually)	0.8	1.6	0.8
5/23/80	Reduced base rates by removing TMI-1 costs ($11.7 million annually)	-	(5.8)	(5.8)
	Increased LEAC for TMI replacement power costs ($21.9 million annually)	-	12.8	-
	Recovery of deferred energy cost balance ($7.8 million over 18 months)	-	3.0	2.4
Net rate recovery allowed--1979		$52.8		
TMI energy cost recovery--1979		$18.0		
Net rate recovery allowed--1980			$77.3	
TMI rate recovery allowed--1980			$48.9	
Rate recovery allowed through June 1981				$12.2

In addition to the rate decisions rendered by PaPUC and NJBPU since the accident, each regulatory body has initiated actions that could affect the future course of the GPU System. PaPUC and NJBPU have also gone on record in their most recent rate orders that the Federal Government has a financial role to play in responding to the aftermath of the accident.

PaPUC actions--In late 1979, PaPUC selected a managment consulting firm to do a management and operations study of Met Ed/GPU as a major part of the Commission's comprehensive regulatory response to the TMI accident. The purpose of the study was to determine the extent to which the utility has contained costs, developed reasonable long- and short-range plans for continued operations, provided proper service to customers, and is properly organized and managed. On March 4, 1980, the firm provided direct testimony by a number of its staff on the partial results of its study in hearings before PaPUC concerning Met Ed and Penelec rate matters (Docket No. 1-79040308). Completion of Phase I of the study is expected by August or September 1980. Phase II would be a continuation of the study into areas identified in Phase I as agreed to by PaPUC.

In its June 15, 1979, order (Docket No. 1-79040308) concerning findings on Met Ed and Penelec rate filings, PaPUC noted that with respect to increased cost projections resulting from increased demands for electricity, the companies' witness testified "that the management has neither undertaken, nor even considered, specific actions to encourage conservation by the ratepayers." As a consequence, the Commission ordered Met Ed and Penelec to submit a series of conservation plans within 30 days relating to methods to encourage decreased consumption of electric power to reduce the companies' costs for purchasing replacement power.

PaPUC has made very plain its dissatisfaction with the way the Federal government has responded to the accident. In its May 23, 1980, rate order for Met Ed and Penelec, the Commission pointed out the "failure of the Federal government to respond to the accident at Three Mile Island with financial assistance that is commensurate with its responsibility for the development of nuclear energy." The Commission also pointed out that the Federal Government has been a keystone in the development of commercial uses of nuclear power and has insured, promoted, and exclusively regulated its development. The Commission referred to congressional acceptance of the idea that the Federal

government should intervene in the event of a major nuclear incident when it enacted the Price-Anderson Act in 1957 and a further commitment to take the action deemed necessary and appropriate to protect the public from the consequences of a nuclear disaster when it extended the act in 1975. The Commission further stated its belief that "the people of Pennsylvania should not have to bear the entire burden--emotionally or financially--where that burden properly belongs to all those who have benefitted from the development of nuclear energy."

NJBPU actions--The New Jersey Board has taken several specific actions to expand its understanding of the needs of Jersey Central and protect its customers from paying unreasonable costs. In an Interim Order dated May 13, 1980, 1/ the Board stated that it is conducting two major investigations related to the accident. One investigation is an inquiry into the question of Jersey Central's potential fault in the accident, a full exploration of the underlying causes, and the role played by the respective companies. The Board has also commissioned a Strategic Options Study to determine the least cost option of supplying safe, adequate, and reliable services to Jersey Central ratepayers. Jersey Central has also been directed to seek out all possible purchase power agreements that would reduce costs to consumers and to negotiate successfully a contract for low-cost power from Ontario Hydro.

At the Federal level, the Board has appealed directly to the Federal Energy Regulatory Commission for relief from the high-cost split savings formula utilized in the pricing of PJM Interchange sales. In his comments on the May 13, 1980, order one of the Commissioners also reported that the Board has actively interceded with NRC on the TMI-1 restart on behalf of Jersey Central ratepayers. The Commission stated that the Board has repeatedly pointed out the financial burdens imposed by the continued unavailablity of TMI-1 and has urged NRC, subject to all relevant safety and health precautions, to return TMI-1 to service.

Finally, the Board has drawn up an action agenda for soliciting Federal assistance. It is the Board's position that the costs of TMI-2 should be spread over a much broader base than the New Jersey and Pennsylvania ratepayers.

1/BPU Dockets No. 804-285, 803-172, and 795-508A.

NRC regulatory actions

The decision by Met Ed officials on March 28, 1979, to delay the scheduled startup of TMI-1 was followed by NRC orders on July 2 and August 9, 1979, directing that TMI-1 remain in a shut-down condition until the resumption of operations is authorized by the Commission. The July 2 order specified that a public hearing would be scheduled prior to restart approval. The August 9, 1979, order established:

--eight actions that Met Ed has to take with respect to resolving concerns that TMI-1 can be operated without endangering the health and safety of the public,

--four longer term actions that Met Ed will be required to complete as promptly as practicable and show reasonable progress on the completion of such actions prior to restart, and

--an Atomic Safety Licensing Board (ASLB) to conduct the public hearings, approve intervention petitions,and render an initial decision to the Commission.

The order also directed ASLB to handle the hearings in an expeditious manner and give priority to consideration of those issues which are directly related to suspension of operations.

Progress on the restart issue has been very slow. In September 1979, Met Ed submitted the first phase of its final report on actions taken in response to the NRC order. As of April 23, 1980, 16 amendments have been added for NRC staff review and approval. An NRC official said the basis for the delays has been in the submission of the restart report and the NRC staff review. He said Met Ed's initial submission was incomplete but acknowledged that NRC had not told Met Ed officials what would constitute an acceptable report.

The August 9, 1979, order contained a proposed hearing schedule from date of notice to the Board decision. Adherence to this schedule would require that the Board provide a decision to the Commission by July 1980. An NRC official said the schedule was unrealistic given the number of days that are legally required for each step in the process. Consequently, on February 12, 1980, the NRC staff

took a realistic look at the hearing process as of that date and proposed a revised schedule for completing the hearing. Under this schedule the initial Board decision to the Commission would be made in late January or early February 1981. According to the staff, even this time period may be optimistic.

ASLB has granted a number of extensions to date, although these have been somewhat offset by decreases in time requirements for other steps. Public hearings were expected to start in Harrisburg, Pennsylvania in mid-summer 1980. The starting date is currently scheduled for October 1980, with no definite completion date established. An NRC official said that Met Ed has probably completed 80 to 90 percent of the required items. The question of management competence, however, is still an open item and NRC has no acceptable criteria for measuring what it should be.

The NRC treatment of Met Ed's restart program is substantially different from that accorded to other utilities with similar reactor units. All Babcock and Wilcox (B&W)-designed reactors were closed down by NRC order after the TMI accident, but all except TMI-1 were allowed to restart without having made all the required changes and without the prestart public hearings. After-the-fact hearings are scheduled, however, for two of the reactors closed down by the initial NRC order. An NRC official said the Commission was not required to hold hearings and even today could rescind the order and let TMI-1 restart without a hearing. The official also said, however, that he believed public pressure would preclude such a decision by NRC.

Some of the required safety-related changes are also unique to Met Ed and not necessarily applicable to other B&W reactor operators. These involve the shared facilities problem; waste management capability; management problems in quality assurance, health physics, and operater training; and the financial ability of Met Ed to operate the plant.

GPU officials believe that NRC has set an unnecessarily extended schedule for the restart of TMI-1 and has allowed the schedule to slip without adequate reason. They also believe that the issues in the restart proceeding could, with no reduction in safety, be resolved much more swiftly.

These officials also believe that NRC has unnecessarily delayed decisions on matters related to the TMI-2 clean-up. This was particularly true of the decision to delay venting the containment building.

An NRC official stated that the release of the Krypton 85 gas from the containment building was perfectly safe and would be within every standard set by any agency. An NRC summary update on the status of TMI units 1 and 2, issued March 27, 1980, indicated that on March 12, 1980, the NRC staff issued a report to the NRC Commissioners recommending that GPU's plan for the release of the Krypton 85 gas by controlled venting through the stack be allowed to proceed. The Commission waited, however, until June 12, 1980, to authorize the venting of the containment building. In the interim, the Governor of Pennsylvania had an independent assessment made of the potential health hazards of venting the gas. The report provided to the Governor on May 15, 1980, 1/ supported the position that the release of the Krypton 85 gas posed no health hazard.

NRC has established a task force to assess the requirements for personnel and funding that it would need if it were to assume the responsibility for cleaning up the accident-related damage to TMI-2. Although NRC does not anticipate that such a condition is likely to occur, sufficient probability exists that the total costs may be too much for Met Ed to handle and that the responsibility to complete the work would be given to NRC. The task force expects to submit its report to the Commission by late July 1980.

Department of Energy

DOE has been only peripherally involved in the TMI issues. In the months following the accident, ERA's Office of Utility Systems prepared a preliminary report as a prelude to establishing a policy position on how to treat costs associated with major utility equipment outages. This was followed up on September 11, 1979, by a memorandum describing five regulatory options for allocating costs arising from such major outages. The memorandum left the final recommended course of action to a working group composed principally of ERA staff members. No final product, however, has emerged from the working group and no further work is anticipated.

ERA's utlity system staff also attempted to develop a computer model to assess the effects of the TMI outage on

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1/Union of Concerned Scientists, "Decontamination of Krypton 85 Gas from the Three Mile Island Plant," May 15, 1980.

system reliability. The model did not produce the desired results and further work on it was stopped. An ERA official said that the staff had used other means at their disposal to assure themselves that reliable power supplies could be provided by the GPU System and that therefore no further studies have been conducted. The official also said there may be some ERA staff involvement in GPU's plans to promote a major conservation program to help alleviate its generating capacity shortage.

FERC has been involved in three GPU company rate case settlements since the accident. The initial wholesale rate cases were filed by Penelec on September 1, 1978; by Met Ed on November 13, 1978; and by Jersey Central on December 18, 1978 as a means of fully reflecting in the resale rates the cost consequences associated with the commercial operation of TMI-2. The Jersey Central filing also included general cost increases which had occurred since 1976. Following the TMI-2 accident, discussions were held with the involved parties as to how the ongoing costs of TMI-2 should be equitably shared. In the Penelec case, the company suggested that one method of sharing the cost would be to include the TMI-2 investment in rate base but to reflect in its capitalization a zero return on the common equity portion of the investment in the unit. A similar proposal was made for the Jersey Central case and settlement agreements were subsequently approved by FERC. Like all dollar settlements under the Federal Power Act, these settlements do not establish any principles or precedents. The decision on Met Ed's filing is still pending before FERC.

EFFECT OF REGULATORY ACTIONS ON GPU SYSTEM FINANCES

State and Federal regulatory commission actions taken since April 1979, have materially aided the System companies in remaining solvent but have done little to provide solutions to the longer range problems of increased earnings and the restoration of full financial viability. The rate relief ordered by the State utility commissions will improve the System's cash flow and reduce the pressure on short-term bank borrowings, but the lack of dividend payments by the companies will severely limit GPU's role in providing financial assistance to the operating companies.

The decline in earnings capability resulting from removing the TMI units from base rates and the regulatory delay in returning TMI-1 to service have contributed to the System's uncertain ability to maintain reliable service and pay the clean-up and restoration costs of TMI-2.

Cash flow problems have been temporarily alleviated

On June 15, 1979, GPU officials negotiated a Revolving Credit Agreement (RCA) with 43 1/ banks to provide a maximum of $412 million of short-term borrowings for the System. These funds were to finance the unrecovered cost of purchased replacement power and other current cash obligations. The banks have thus far limited the System's borrowings to $292 million and at the present time there is no certainty that the limit will be increased. These short-term RCA borrowings allowed the System to pay for the power necessary to continue providing service to customers and avoid insolvency, but by April 1980 the RCA credit limit was rapidly being reached by Met Ed and Jersey Central. Penelec, on the other hand, had its short-term borrowings paid up.

The State commissions' rate orders granting the utilities authority to collect the current cost of purchased power and to recover expeditiously the companies' deferred energy costs are now providing a sufficient cash flow for the System to meet its current obligations and reduce its short-term bank borrowings. The tenuous position of Met Ed and Jersey Central just prior to their last rate increases, however, was expressed by both PaPUC and NJBPU. In ordering the full recovery of current energy costs, PaPUC stated that Met Ed's extreme dependence on short-term debt creates an unstable financial condition which potentially threatens the continued provision of utility service to its customers. NJBPU was more explicit in detailing the financial condition of Jersey Central prior to granting the company a $60-million interim rate increase on May 13, 1980, The Board found that:

1. Jersey Central will exhaust its short-term debt limit under its Revolving Credit Agreement before the end of May.

2. Under current rates, Jersey Central does not have sufficient interest coverage to sell long-term debt or preferred stocks.

3. GPU cannot sell common stock in its present financial condition.

4. Overall, under existing rates, Jersey Central will not be able to finance construction required to insure safe, adequate, and proper service.

1/ Two other banks were added later.

GPU's cash receipts and disbursements forecast for 1980--made prior to the latest rate increases--shows a projected cash balance of only $8 million on December 31, 1980. As shown in table 3-2, this compares to cash balances available on January 1, 1978, 1979, and 1980, of $27 million, $18 million, and $69 million, respectively. The $8-million cash balance represents only 0.4 percent of the System's total estimated revenues. The occurance of any event, or combination of events, that would cause expected revenues to decline or expenses to increase could quickly wipe out the $8 million.

Under normal operating conditions, a low year-end cash balance would not be a significant factor in a utility's financial viability. What is more important is the availability of credit. In 1978, for example, the difference between revenues (plus beginning cash balance) and disbursements, capital costs, and capital expenditures was a $127-million deficit for Jersey Central and a $151-million deficit for Met Ed. In both cases, the companies made up the cash deficit by issuing bonds and borrowing from banks.

For the GPU System in 1980, however, normal financing is not readily available and therefore the cash position becomes more critical. The present uncertainties have essentially denied the companies access to the long-term bond market. Given a continuation of high-cost purchased power and less than full recovery of current costs, the funds available through the Revolving Credit Agreement would soon be exhausted. The removal of TMI-1 and 2 from the companies' base rates has adversely affected earnings and further limited the System's options for securing needed funds.

Given the seriousness of the System's financial outlook, the May 1980, NJBPU and PaPUC rate orders providing an additional $78 million in revenues are a much-needed impetus to restoring credibility with the financial community. If the current projected revenues and expenses are close to actual, the additional $78 million would provide a cushion that would help stabilize the System's short-term cash needs and provide funds to cover expenditures not recoverable through consumer rates.

Table 3-2

GPU System Cash Receipts & Disbursements
($, millions)

	1978	1979	1980 estimate
Balance cash—beginning of period	$ 27	$ 18	$ 69
Receipts:			
Base revenues (except energy & TMI)	$ 813	$ 856	$ 898
Base revenues TMI-1	60	60	22
Base revenues TMI-2	20	27	-
Energy revenues	429	524	860
Total revenues	1,322	1,467	1,780
Disbursements:			
Operating costs			
Energy costs	395	525	837
Energy costs deferred	18	70	78
Payroll	127	133	143
Other O&M	170	188	208
Taxes/other than income	143	127	155
Income Taxes	4	(24)	-
Other Income	(4)	(8)	(6)
	853	1,011	1,415
Capital costs			
Interest	160	188	223
Preferred dividends	44	44	44
Common dividends	106	73	-
	310	305	267
Capital Expenditures			
Construction (ex. AFC)	336	267	252
TMI - recovery costs	-		
Less insurance recoveries		25	19
	336	292	271
External Financing			
Bonds	154	154	13
Bank borrowing	25	87	129
Preferred stock	-	-	-
Common stock	22	5	
Security retirements	(33)	(54)	(30)
	168	192	112
Balance cash—end of period	$ 18	$ 69	$ 8

Source: GPU Corporation.

Short-term bank balances and deferred energy costs remain high

Although the rate increases during 1979-80 have helped the companies avoid insolvency and possible bankruptcy, the short-term bank borrowings under the Revolving Credit Agreement for the May-December 1980 period are expected to increase by $6 million. The following table shows the expected balances for each company and for GPU.

Table 3-3

General Public Utilities Corporation
Actual and projected net short-term debt
May-December 1980
($, millions)

	May	December
Jersey Central	$133	$106
Met Ed	88	101
Penelec	-	14
GPU Corporation	44	50
System total	$265	$271

Source: GPU Corporation.

Actual and projected balances in the System's deferred energy accounts shows a similar trend for 1980. As shown below, the total deferred energy costs are expected to increase during 1980 although some decline is expected from the high point reached in March.

Table 3-4

General Public Utiities Corporation
Deferred energy balances
($, millions)

	JC	ME	PN	Total
December 1979	$ 77	$ 83	$ 13	$173
March 1980	143	97	21	261
June 1980*	144	87	24	255
September 1980*	127	72	15	214
December 1980*	124	55	17	196

*Estimated.

Source: GPU Corporation.

Our analyses of effects of rate increases

We examined the relationship between rate increases granted to pay for replacement power costs for the TMI units during 1979-1980 and the actual/estimated costs of that power for that period. As shown in table 3-5, the System will be over $192 million short of meeting current replacement power expenses by the end of 1980 unless additional rate increases are granted between June and November 1980.

Table 3-5

Comparison of Replacement Energy Costs and Approved Rate Increases in GPU System: April 1979-December 1980
($, millions)

Company	Purchase/ interchange	Rate recovery	Net gain (loss)
Jersey Central	$224.1	$140.5	($ 83.6)
Met Ed	217.2	141.8	(75.4)
Penelec	99.9	66.9	33.0
System total	$541.2	$349.2	($192.0)

If the estimated quantity and costs of replacement power for 1980 are reasonably accurate, the companies will face a continuing drain on their internally generated cash resources, further reliance on bank borrowings, and further additions to their deferred energy accounts.

The large balances in the companies' deferred energy accounts, as noted in table 3-4, are the results of State regulatory decisions not to require customers to pay current energy costs as they were incurred by the utilities. The March 31, 1980, balance of $261 million consisted primarily of replacement power costs for the TMI units that were not allowed in the utilities' LEAC rate allowances.

Both PaPUC and NJBPU recognized the need to allow the utilities to recover these deferred costs, particularly those costs incurred prior to the TMI-2 accident. In its June 19, 1979, order PaPUC allowed Met Ed and Penelec to collect about $11 million per year of the $33.4 million in their deferred energy account on December 31, 1978. On May 23, 1980, PaPUC allowed Met Ed to amortize over an 18-month period the $84.6 million balance in its deferred energy account as of February 28, 1980. Penelec was also allowed to increase its rates to recover the $7.8-million balance in its deferred account over the same time period.

NJBPU has been slower to act than PaPUC in allowing Jersey Central to recover these past costs. In 1979, the Board was only allowing Jersey Central to recover its $51 million of deferred energy costs at a rate of

$2.3 million per year. It was not until its April 1, 1980 order taking TMI-1 costs out of Jersey Central's base rates that the Board increased the deferred energy cost recovery to $17.9 million annually. However, the Board has not yet provided for the recovery of the $87 million in deferred energy costs incurred since January 1979.

Expected future costs will affect revenue requirements

The need to recover the hundreds of millions of dollars already expended but not collected will be exacerbated by the need to raise an additional $3.5 to 4.0 billion over the next 5 to 7 years to fund essential costs of cleaning up TMI-2 and provide assured supplies of reliable power. Current estimated costs for the major projects that need to be undertaken are shown in the following table.

Table 3-6

Major Capital Expenditures
Proposed for the GPU System 1981-1986
($, millions)

Type of expenditure	Estimated cost
New power generation:	
Seward 7 coal plant	$ 700
Other	250
Modify existing generation	430
Transmission system:	
Ontario Hydro Intertie	250
Other	450
Extend distribution system	730
Nuclear fuel	400
Other (including conservation and load management programs)	140
TMI-2 clean-up and restoration (note a)	600
Total proposed expenditures	$3,950

a/Current estimate net of $300 million insurance proceeds.

Source: GPU Corporation.

Loss of TMI units from base rates have seriously affected System earnings

The State commissions' actions providing equivalent dollar energy revenues to replace the revenue lost by removing TMI-1 and 2 costs from base rates has done little more than help the companies meet current cash flow needs. The System's loss of a return on over a billion dollars of investment in the TMI units has had a serious effect on the companies' earnings capacity and their ability to attract the investment capital needed to complete the projects identified in the previous section. In addition to losing the return on invested capital, removing the TMI units from rate base precludes the companies from recovering any costs associated with servicing debt and preferred stock, depreciation expense, and station operating and maintenance expense. This action has the effect of requiring the company to provide funds to cover these obligations from other sources. As of March 31, 1980, GPU officials stated that these costs totalled about $120 million for TMI-2. The subsequent loss of TMI-1 for rate base treatment on May 23, 1980, will add to this total because the funds to cover the fixed expenses for that unit will also have to come from other sources.

The effect of the System's reduced earnings capacity has been a matter of concern to the banks that have been providing funds under the Revolving Credit Agreement. In a May 15, 1980, letter to GPU and the operating companies following the May 9, 1980, PaPUC order, the banks recognized that while the rate actions taken by PaPUC and NJBPU have been responsive to many of GPU's needs, they believe that substantial questions remain as to the ongoing financial viability of the System. The letter stated further:

> "As the Banks have consistently maintained, actions amounting to the removal of TMI-1 from the rate base of GPU's operating companies are cause for serious concern, as are any modifications to rates which adversely affect earnings (as distinguished from revenues) and, thus, impede the capacity of the Borrowers to raise funds in the public securities markets. In this regard, while the favorable revenue impact of the PaPUC Order referred to above is acknowledged, its effects of eliminating all earnings for ME for 1980 is very unfavorable."

The loss of the TMI units from rate base has been particularly hard on Met Ed and has also affected Jersey Central's finances to some extent. As 50-percent owner of TMI-1 and 2, Met Ed has about $534 million invested in the two units. Currently, the fixed expenses for the two units approximates $53 million per year. Had the accident not occurred, Met Ed would have been allowed to collect revenues to cover these costs. When the units were removed from Met Ed's rate base, the company lost the right to recover these costs. Although Met Ed is allowed to earn a pre-tax return of approximately $49 million on about $200 million of its non-TMI property, all of these earnings are required to be applied to cover the fixed expenses of the TMI units. The net result of this situation is that GPU, as Met Ed's shareholder, earns no return on its investment and because of the $4 million deficit is losing a part of its investment.

The loss of Jersey Central's 25-percent share in the TMI units from its rate base was not quite as traumatic. The loss of earnings on its investment, however, severely affected its ability to continue paying the fixed cost on its $350-million investment in the construction of the Forked River project. The interest costs alone for the project amount to over $30 million per year, none of which are considered for current cash recovery.

GPU System has taken actions to relieve cash flow/earnings pressures

In addition to its efforts to minimize the costs of purchased power as described in chapter 2, GPU and the operating companies have taken a number of positive actions since the accident designed to reduce expenditures, conserve their available financial resources, and minimize the impact of the accident on consumers. Some of the major actions taken are described below.

Limited construction activities

GPU suspended work on two of its major construction programs--a 1,120 MW nuclear plant at Forked River, New Jersey, and a 625-MW coal-fired plant at the Seward Station near Johnstown, Pennsylvania. The System's projected construction budget for 1979 was $455 million, but this was reduced to $351 million in actual expenditures, a savings of $104 million. Capital expenditures for 1980 are now estimated to be about $271 million. Some routine

maintenance work has also been delayed, principally to help alleviate current cash shortages. Some of these delays, however, such as tree trimming and other power line maintenance, are only stop-gap measures because these functions must be done to maintain reliable service.

Common stock dividends reduction

In April 1979, the GPU Board of Directors reduced the quarterly dividend on common stock from 45 cents to 25 cents and suspended the dividend reinvestment program. The Board later voted to omit the February and May 1980 dividend completely. The reduction of dividends in 1979 and the omission of dividends in 1980 has thus far enabled the System to retain about $92 million to offset the enormous cash drain imposed by the accident.

Energy conservation and load management program

Current estimates of available generating capacity and demand for the System indicate that 2,200 MW of additional power will be needed by 1990. This additional power supply can be obtained by (1) constructing additional plants, (2) purchasing from other utilities, or (3) constraining demand through conservation and load management programs. To limit any unnecessary demands on the System's financial resources and at the request of PaPUC, GPU has undertaken a program to pursue the third option in an attempt to reduce the need for added capacity by 1,000 MW. This program is expected to save the System and its customers over $1 billion during the next 10 years.

Earnings could be improved with a higher rate of return on common equity

The GPU companies are currently allowed to earn about a 13 percent return on common equity as part of their base rates to customers. This return was set by State regulators prior to the TMI accident and has generally reflected the returns allowed since 1972. The rate of return on shareholders' investments strongly influences both a utility's earnings level and the attractiveness of its securities to investors. In March 1980, GPU officials said they did not believe it was necessary to project their future financial needs on a return higher than the 13 percent currently allowed.

To assess the reasonableness of GPU's perception of the adequacy of the allowed rate of return, given the changed nature of the System's finances subsequent to the accident, we analyzed GPU's financial position to determine if a different rate of return, or cost of common equity capital, would better reflect the needs of the System in terms of attracting capital investments and enhancing System earnings. We recognized that forecasting a rate of return on common equity would involve problems beyond those normally encountered in making such a determination in a utility rate case. For that purpose, the concept of a return on equity is generally oriented to the present, or to a slightly historic period, rather than to the future. Consequently, the results of our analysis will be influenced by the deviations that occur between our assumptions and actual events that occur during the projected time period.

A full discussion of the methodology and assumptions used in our analysis is given in appendix III. Basically, GPU's future return on equity was estimated using the Discounted Cash Flow model--which equates the investors' required rate of return to the current dividend yield plus the expected future growth rate of dividends--and the following assumptions:

--Future dividend yields will equal forecasted AA utility bond yields plus a risk premium.

--Future dividend growth rate is equal to the historical average dividend growth.

--Risk premiums will decline over the 5-year forecast period.

Based on this methodology and set of assumptions, our best estimates of future returns on common equity for GPU are:

Year	Estimated GPU return on common equity (percent)
1980	19%
1981	16
1982	15
1983	14
1984	13

It is important to note that the return on equity for GPU is a function of the investment risk of GPU in its entirety rather than of any one of its operational units. The overall risk of the parent is determined by the risks of the subsidiaries and the way in which those risks interact in combination. Investors' perception of risk will be for the parent company, GPU, and will be of the net risk of all the subsidiaries acting together.

The intrinsic return on equity of GPU subsidiaries cannot be empirically estimated because they do not have publicly traded common stock. Each subsidiary may contribute more or less than the average contribution of risk to the parent, but the measurement of such risk contribution is difficult. Therefore, the return on GPU's equity is properly assigned as the return on equity for each of the operating subsidiaries.

Finally, it should be noted that the return on equity plays an important role in the financial integrity of any company. Just as the GPU System must earn a return sufficient to pay its interest on long-term debt and dividends on preferred stocks, the System must also earn a return on the common shareholder's investment, on average over a period of time, that is at least equal to its cost of equity capital. If it fails to do so over an extended period of time, it will be unable to obtain additional equity capital for either expanding or maintaining its plant and service. In the short run, shareholders may bear the penalties of an inadequate return, but in the longer run if the return is not adequate, then investors will not continue to supply additional capital.

Subsequent to our March 1980, discussion with GPU officials on the rate-of-return issue, Jersey Central filed a rate base case with NJBPU--the first System company to do so since the accident. On April 29, 1980, the company filed for a $173-million increase in its base rates to cover increases in all operating and maintenance costs other than those covered by the energy clause adjustment. The rate base filing also includes an adjustment to the company's rate of return. We noted that the company has recognized the need for a higher rate of return than it is currently earning. Jersey Central proposed to NJBPU that it be allowed to earn a rate of return on common equity of 15.5 percent. The company stated, however, that the perceived risk to investors of buying company securities would justify a rate of return of approximately 18 to 20 percent.

A higher rate of return will not substantially increase GPU's estimated revenue requirements

At our request, GPU officials prepared a proposed statement of return for Met Ed showing the revenues required to eliminate the cash flow problem for the period 1980-84. GPU assumed a 13-percent return on common equity in its computations, using a rate base that excluded Met Ed's investment in TMI-2. Using the results of our return on common equity analysis, GPU recomputed its proposed statement of revenue requirements for each of the 5 years. A comparison of the revenues required for Met Ed to meet its current obligations versus the revenues required to increase its earnings and improve its attractiveness to investors is given in table 3-7. As can be seen for 1980, a 19-percent return would require a $65-million increase in revenues over GPU's estimate, or about 15 percent more than GPU projects Met Ed will need to maintain solvency. By 1984, the difference in revenue requirements is only $37 million, or less than 5 percent more than Met Ed's projected revenue needs. The reduction in the difference between the estimated revenue requirements results because of the lower return on equity needed as perceived investment risks are reduced through timely action by State regulators.

Table 3-7

Metropolitan Edison Company

Comparison of Statement of Return Between Proposed GPU Rate of Capital Requirements and as Proposed by GAO
($, Millions)

	1980		1981		1982		1983		1984	
	Company	GAO	Company	GAO	Company	GAO	Company	GAO	Company	GAO
Total revenue	$423	$488	$539	$590	$610	$646	$698	$738	$790	$827
Expenses	350	353	449	451	513	515	610	612	796	698
Net before taxes	$ 73	$135	$ 90	$139	$ 97	$131	$ 88	$126	$ 94	$129
Additional deduction:										
Interest	59	57	57	52	59	51	56	52	56	55
Excess depreciation	38	38	38	38	39	39	42	42	40	40
Deferred energy	38	38	(21)	(21)	(19)	(19)	(20)	(20)	(20)	(20)
Other	(2)	(2)	-	-	(3)	(3)	(12)	(12)	(19)	(19)
Total	$133	$131	$ 74	$ 69	$ 76	$ 68	$ 66	$ 62	$ 57	$ 56
Taxable income	(60)	4	16	70	21	63	22	64	37	73
Income taxes	(28)	2	8	36	11	32	11	33	19	37
Investment tax credit	33	(1)	(6)	(27)	(8)	(5)	(8)	(5)	(15)	(5)
Federal income tax payable	$ 5	$ 1	$ 2	$ 9	$ 3	$ 27	$ 3	$ 28	$ 4	$ 32
Investment tax credit adjustment	(33)	1	6	27	8	5	8	5	15	5
Deferred taxes										
Energy	20	20	(11)	(11)	(9)	(9)	(9)	(9)	(10)	(10)
L D and other	10	10	17	17	15	15	16	16	17	17
Tax on interest of AFUDC	2	-	2	2	3	-	3	-	5	-
Consolidation Savings	-	-	(2)	(2)	(2)	(2)	(1)	(1)	(1)	(1)
Other	-	-	-	-	-	-	(2)	(2)	(6)	(2)
Total taxes	$ 4	$ 32	$ 14	$ 40	$ 18	$ 36	$ 18	$ 37	$ 24	$ 41
Return	$ 69	$103	$ 76	$ 99	$ 79	$ 95	$ 70	$ 89	$ 70	$ 88
Preferred dividends	$ 10	$ 10	$ 10	$ 10	$ 10	$ 10	$ 10	$ 10	$ 10	$ 10
Net	$	$ 36	$ 9	$ 37	$ 10	$ 34	$ 4	$ 27	$ 4	$ 23

Source: GPU Corporation.

CHAPTER 4

CONCLUSIONS AND RECOMMENDATIONS

There is little question that the nuclear accident at TMI-2 on March 28, 1979, has had a significant impact on the present and future viability of the GPU System and its customers. The loss of the TMI units 1 and 2 adversely affected System cash flows and earnings capability. Furthermore, the loss of the units from the System's generating capacity has required a greater degree of dependence on outside purchases of electric power to meet customer's demands.

The System's extensive interconnections and membership in the PJM power pool and its ability to purchase power from utility systems outside the PJM area have allowed it to meet its load requirements, but only at much higher costs than those attributable to the lost generating capacity. Although the dependence on these power purchases/ interchanges has been relatively satisfactory in meeting short-term needs, the restoration of the System's own generating capability is of critical importance if the System is to continue providing adequate supplies of reliable power to its customers over an extended period of time. We believe that the ability of the System to fully recover from the accident, regain its pre-accident financial viability, and expand its generating capacity to required levels is questionable without the help of both State and Federal regulators.

In responding to the concerns of the Subcommittee about the financial viability of the GPU System and the role of regulatory agencies, we have reached the following conclusions.

The financial stability of the GPU System has been seriously affected by the results of the accident but recent State regulatory decisions have temporarily alleviated the System's cash flow problems and maintained the System's solvency.

The immediate impact on the System's financial viability was the drain on the companies' cash reserves to pay for the large quantities of high-cost power purchases necessitated by the loss of the TMI nuclear units. Penelec was affected to some extent, but Met Ed and Jersey Central were the most seriously affected--Met Ed because of its

heavy reliance on the TMI units for generating capacity and Jersey Central because of an already short cash position due to its prior construction commitments to the Forked River project. In 1979, the System's purchased-power costs increased to $268 million, or more than double the $133 million spent in 1978. Nearly $233 million of the 1979 total costs were incurred during the period April-December. Replacement power cost estimates for 1980 increased this amount to $541 million by year end. For the 1979-1980 period the companies have only been allowed to recover $349 million in revenues from customers to offset the replacement power costs.

The time lag between purchased power payments and revenue receipts from customers has not only required the companies to add the uncollected power costs to an already large deferred energy cost account but required them to borrow the money to pay for the power at high interest rates. This has effectively limited the short-term borrowing resources normally available to pay other costs that are affected by the same time lag.

By early 1980, both Met Ed and Jersey Central were rapidly reaching the point of insolvency. GPU itself was in no position to provide any financial relief. Dividends from the operating companies had been reduced to only $49 million in 1979, down from an average of $133 million over the prior 4-year period. GPU paid common stock dividends of over $73 million in 1979, but needed to borrow funds under the Revolving Credit Agreement to make the payments and meet its other expenses. The precipitous drop in the market price of its common stock precluded GPU from selling any of its common stock to raise funds, leaving it with no real source of income until company dividends are eventually restored.

The May 1980, Pennsylvania and New Jersey rate increases for Met Ed and Jersey Central provide sufficient revenues for the companies to remain solvent and to keep current on their purchased power costs. The increase will also allow Met Ed to recover $84.6 million of deferred energy costs--paid for with borrowed money--over an 18-month period. However, the company's short-term debt is still expected to increase from $88 million to $101 million between May and December 1980. Unless a significant part of the deferred costs collected in 1981 are used to repay the bank loan, Met Ed will finish the year with a reduced deferred energy cost account but no resources to draw on to complete repayment of the loan.

Removal of the TMI units from the companies' rate base considerations has an adverse impact on earnings needed to assure the System's future financial viability and the continuation of reliable power supplies.

The States' regulatory decisions to take the TMI units out of the companies' rate bases effectively removed over $1 billion from their earnings potential. Met Ed, because of its 50-percent share of the TMI costs, was affected more than the other companies. In addition to the loss of return on invested capital, the continuing fixed costs of the two units--depreciation, interest on debt, preferred stock dividends, and maintenance costs--have to be paid for out of the return earned on other non-TMI plant investments. Since these fixed costs for Met Ed are currently higher than the earned return on non-TMI investments, Met Ed has no ability to accumulate internal cash funds to cover expenses not immediately recoverable through customer charges. These expenses include items such as TMI-1 modifications to meet NRC safety standards, the company's share of TMI-2 clean-up costs not immediately covered by insurance payments, and transmission and distribution construction costs necessary to maintain reliable service.

The loss of Met Ed's earnings on the TMI units leaves only two alternatives for it to cover its fixed expenses--increased short-term borrowings or increased rate revenues. A comparison between Met Ed's present bank-imposed ceiling of $105 million on its short-term borrowings and its current balance of $88 million indicates it has little flexibility in its financing program. Consequently, until one or both of the TMI units are allowed to restart and returned to rate base, Met Ed will be almost completely dependent on rate relief if it is to remain financially viable.

The TMI-2 accident has severely limited the System companies' ability to obtain funds from the capital market.

Most utility company financing consists of using short-term bank borrowings or internally generated cash funds to pay construction costs or unrecovered O&M costs, and than issuing common or preferred stocks or long-term bonds to pay off the short-term borrowings. This method requires ready access to both bank credit and the capital markets. Access to the capital markets is dependent on a company's dividend payment record, compliance with certain interest coverage requirements, and a satisfactory rating by bond rating agencies.

Immediately following the accident, the bond rating agencies downrated most of the debt securities of the operating companies. Although a low rating does not preclude a company from issuing bonds, some investment firms are precluded by their charter from investing in low-rated securities. In any event, prudent investors would require an interest return well above that earned by a higher-rated company to compensate for the perceived risk of the investment. The uncertain future liabilities of the company relating to clean-up costs and possible legal claims required GPU's independent auditors to render a qualified opinion on the 1979 financial statements. This has also precluded some institutional investors from buying operating company bonds. Furthermore, the reduced earnings lowered the interest coverage ratio below the legally required level for Met Ed and Jersey Central. As a consequence, long-term debt financing is not a viable option for the companies. GPU's ability to assist the companies has also been limited. GPU normally sells common stock to raise needed capital for its own expenses and to reinvest in the operating companies. The value of GPU common stock, however, has fallen to 25 percent of book value, making it impossible to sell its stock as a means of providing capital for these needs.

We believe that these conditions will persist until the regulatory agencies allow a sufficiently high rate of return on stockholders investment to adequately compensate them for the perceived riskiness of their investment and until the companies' earnings capabilities are increased by the return of TMI-1 and 2 to service.

The loss of earnings capability raises questions as to the System's ability to fund TMI-2 clean-up costs and needed generating capacity.

Without a quick restoration of earnings capability and a sufficiently high rate of return to attract investment capital, the System may not have sufficient funds to complete the clean-up and restoration of TMI-2. The latest estimate of the cost is in the range of $800-900 million--of which only $300 million is covered by insurance. This means that Met Ed could be required to pay as much as $300 million for its share of the costs. With a reduced earnings base, no access to bond markets, and minimal flexibility in short-term borrowings, Met Ed's prospects for raising the necessary funds are dim without extensive PaPUC rate relief. Jersey Central's share of the clean-up would

be $150 million, but with the financial problems it faces in adding needed capacity, it too will need additional rate relief to meet its obligations. GPU will continue to face a heavy indebtedness, particularly if it attempts to resume dividend payments. With the current and future financial burdens on Met Ed and Jersey Central, it appears that dividend payments by the companies--except for Penelec --will be minimal in the foreseeable future. This effectively precludes any financial support to the companies from GPU in their clean-up effort.

Obtaining the $500-600 million for clean-up costs is further complicated by the fact that these costs are only a part of the funds needed by the System over the next 5 to 7 years to maintain reliable service. The uncertainties associated with the TMI units returning to service in the near future make it almost mandatory that the System move ahead with its plans to construct the Ontario Hydro intertie and build the Seward 7 coal plant and reduce its dependence on purchased power. The billion dollars needed for these two projects could conceivably come from external sources, but only with an improved financial posture. Another $2 billion is needed to maintain and improved transmission and distribution systems. This places an even greater responsibility on the regulators to improve the financial viability of the companies since an adequate transmission and distribution system is vital in meeting consumer needs regardless of the power supply source.

We believe that to deny the System the ability to obtain the funds necessary to restore TMI-2 to service and add the necessary generating, transmission, and distribution capacity to maintain reliable service will be detrimental to the System's customers in the long run. Without a return to self-sufficiency, dependence on power purchases could well increase but with a decrease in reliability. Rates chargeable to customers are also likely to continue increasing and they may well end up paying more for power in the future than if the funds necessary to allow the companies to recover financially were provided in the next few years.

Federal regulatory agencies have done little to expedite the System's recovery from the accident.

At the Federal level, NRC has had the principal role in overseeing the restart of TMI-1 and the clean-up operations on TMI-2. The Department of Energy's ERA and FERC

have had oversight responsibility for assessing reliability of service and approving wholesale rate settlements.

NRC's order delaying the restart of TMI-1 until a public hearing is held has been the primary cause of the System's loss of earnings capacity and the extended need for additional increments of purchased power. Although the initial NRC order on TMI-1 directed ASLB to handle the hearings in an expeditious manner and give priority to consideration of those issues directly related to the suspension of operation, numerous extensions of time have been granted leading to delays in completing the hearing process. In addition, NRC has not given Met Ed the necessary guidance and criteria to ensure timely compliance with the order.

NRC has treated Met Ed's restart program differently from other utilities with Babcock and Wilcox reactors. We do not question their judgment in setting different requirement and procedures, given the situation at TMI. However, we believe that the uniqueness of the situation that led to the differing requirements should also engender different procedures for expediting the corrective actions needed and the return of the unit to service. Performance criteria that are lacking either for restarting TMI-1 or cleaning up TMI-2 should be expeditiously furnished and timely decisions on company compliance with the requirements should be made. While full recognition of the public's right to participate in the decision making process should be given, the hearing process should be conducted so that it is as equitable to the utilities as it is to the public.

The ERA staff continues to monitor the effects of the accident on reliability of service, but has not taken an active role in assessing the effects of the System's financial problems on future capacity needs. The projected availability of purchased power is seen as minimizing any reliability problems in the near term, with the added cost of this power being a State, not a Federal, problem. FERC has also been only peripherally involved in the after-effects of the accident since the System's wholesale sales are only a small part of total sales. In the two rate cases settled subsequently to the accident, FERC officials elected not to hold formal hearings and consequently have not had to establish any principles or precedents on how accident related costs should be shared.

The slow reaction of the regulatory agencies to meet the most pressing needs of the GPU System and their reluctance to

project a definite policy positon on what should be done to mitigate equitably the adverse consequences of the TMI accident have left an aura of uncertainty around the TMI restart and clean-up efforts that significantly affect the future of the System and its customers. Federal regulators appear to be reluctant to become too deeply involved while the State Commissions are giving strong indications that Federal support is needed.

Further examination of TMI aftermath is warranted

We believe that the nature of the accident with its potentially adverse effects on consumers, the GPU System, and the utility industry requires a different approach to regulation than has been seen heretofore. The present fragmented roles and responsibilities of the various Federal and State regulatory agencies need to be brought together into a unified approach towards resolving the problems created by the accident. We believe there is a need to combine the efforts of all the responsible agencies and examine the current and future needs of the System and its customers, how these needs can best be met, the extent and reasonableness of the System's recovery costs, and how these costs can and should be shared most equitably.

The studies currently being performed for PaPUC and NJBPU may well answer a number of questions about the future of the GPU System. We believe, however, that in conjunction with these studies a federally directed examination into the long-range needs of the System and its service area is necessary, both because of the interstate, interagency relationships that exist in nearly every issue and because of the significance of the new issues and their resolution for the future of nuclear power generation.

Because of its role as the national energy agency, we believe that DOE is the best-suited Federal entity to serve as the lead agency in undertaking the examination discussed above. The Department has important responsibilities for electric power supply and national energy policy. It is empowered to conduct investigations concerning various facets of the electric energy area.

The examination should be conducted with the full support and cooperation of the Federal Energy Regulatory Commission and the Nulcear Regulatory Commission. In conducting its examination, we expect that the Department would as a minimum, respond to the following questions.

--How reasonable are the present cost estimates for clean-up and recommissioning of TMI-2?

--What are the detailed costs of clean-up and recommissioning? How would insurance payments be affected if the unit were cleaned up and then abandoned?

--What is the probability TMI-1 will be allowed to restart? When? If delayed beyond the current scheduled dates, why? What is the effect on the System's finances if it is not allowed to restart?

--Given that the clean-up estimates are reasonable and recommissioning is feasible, what are the likely sources of financing the effort?

--What are the legal responsiblities of the operating companies if one company defaults on its share of clean-up costs?

--How valid are the System's projected needs for capital expenditures over the next 5 to 6 years? What effect will failure to complete it have on System reliabilty?

--How likely is it the System can finance its capital construction requirements and the clean-up/recommissioning costs?

--How much of the financial burden can be placed on consumers? On shareholders?

--What responsibility does the Federal Government have in providing assistance in the event of a nuclear accident such as Three Mile Island.

--What effect will the formation of GPU's nuclear operating corporation have on TMI-1 restart and TMI-2 clean-up efforts?

RECOMMENDATION TO THE SECRETARY OF ENERGY

We recommend, therefore, that the Secretary of Energy undertake a detailed study of the GPU system regarding its future role as a provider of electric power in Pennsylvania and New Jersey, and that the Chairman, FERC, and the Chairman, NRC cooperate and contribute to this study to the fullest

extent possible. This study should have as its objective a report to the Congress, including a statement of any specific actions to be taken by the utilities or any of the Federal regulatory agencies and any recommendations to the Congress. We expect that if external assistance is needed, alternate sources of such assistance would be discussed. Given the current study efforts of NRC, PaPUC, and NJBPU, the detailed financial data developed by FERC in its recently concluded rate cases for the companies, and ERA's extensive knowledge of the System's generating capacity requirements and sources of alternate power supplies, we believe that the report can be completed and submitted no later than February 1, 1981.

RECOMMENDATIONS TO THE CHAIRMAN, NUCLEAR REGULATORY COMMISSION

Given the significant effects on the financial viability of the GPU System and on consumer rates in the System's service area caused by the delayed restart of TMI-1, we recommend that NRC move as quickly as possible, while taking all necessary steps to protect the public health and safety, to consider and act on the question of restarting TMI-1. In addition, we recommend that the Chairman cooperate fully with the Secretary of Energy in the study of the GPU System and its needs and provide all possible assistance in fully developing the regulatory responsibilities of the Commission as they relate to the restart, clean-up, and recommissioning of the TMI units.

APPENDIX I

United States Senate
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
WASHINGTON, D.C. 20510

January 18, 1980

The Honorable Elmer B. Staats
Comptroller General
General Accounting Office
Washington, D.C. 20548

Dear Mr. Staats:

As you know, the Senate Nuclear Regulation Subcommittee has been charged by the Senate with conducting a one-year examination of the nuclear reactor accident at Three Mile Island. In the course of this inquiry, one of the aspects being examined is the financial capability and responsibility of electric utilities to deal with reactor accidents.

On November 8-9, 1979, the Subcommittee held public hearings which focused to some extent on the financial capacity of the operator of Three Mile Island, the Metropolitan Edison Company (MetEd), to recover from the accident. During these hearings, three members of your staff, Clifford Gardner, Ronald Kader, and Alfred Francfort, assisted the Subcommittee in that phase of the inquiry. Several issues surfaced during those hearings which we believe require further study by the General Accounting Office.

We therefore request that the GAO provide responses in report form to the questions listed below:

1. Please provide an analysis of the financial capability of General Public Utilities Corp. (GPU), the parent of MetEd, to maintain that subsidiary and assist that company in the plant cleanup and refurbishment costs.

2. Can either GPU or its subsidiary afford the costs of cleanup, replacement power and recommissioning of Unit 2, the disabled reactor, without Federal funding and/or including these costs in the rate base?

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3. To what extent should these costs be included in the rate base or be borne through Federal funding?

4. Have MetEd's power costs increased as a result of the Three Mile Island accident, and, if so, how much and why?

5. How have any increased power costs been distributed among customers and shareholders?

6. Have any State or Federal regulatory agencies taken any actions affecting the financial viability of the Three Mile Island plant owners?

7. Are regulatory and accounting treatments used by the Nuclear Regulatory Commission with respect to costs incurred to shut down nuclear plants adequate? If not, why not?

8. What are the Federal regulatory agency policies with respect to accident cleanup and recovery costs as far as who is to bear the cost - the ratepayer or the shareholder?

We understand that no government agency at present at the State or Federal level has done an in-depth evaluation of the financial issue with respect to nuclear accident cleanups. GAO's examination of this matter will be most helpful.

Since this inquiry is working under severe time constraints, it is necessary that we have your report no later than May 1, 1980. Should you have any questions concerning this matter, please contact Jay Boudreau at 224-6593.

Sincerely yours,

Alan K. Simpson
Ranking Minority Member
Subcommittee on Nuclear Regulation

Gary Hart
Chairman
Subcommittee on Nuclear Regulation

APPENDIX II

DEFINITION OF MOODY's RATING SYMBOLS

Debt	Preferred Stock
Aaa = Best Quality; interest and principal exceptionally secure.	"aaa" = Top quality; good asset protection and least dividend impairment.
Aa = High quality; margins of protection may not be as large as in Aaa bonds	"aa" = High grade; reasonable assurance of well maintained earnings and asset protection in foreseeable future.
A = Upper medium grade; many favorable investment attributes; security principal and interest adequate but may be susceptible to impairment in future.	"a" = Upper medium grade; earnings and asset protection expected to remain adequate.
Baa = Medium grade; neither highly protected or poorly secured.	"baa" = Medium grade; protection adequate for present but may be questionable over long term.
Ba = These have speculative elements; not well safe guarded during both good and bad times.	"ba" = Speculative elements; future cannot be considered well assured; characterized by uncertainty.
B = Lack desirable investment characteristics; assurance of interest and principal payments over any long period of time may be small.	"b" = Lack desirable investment characteristics; assurance of dividend payments and maintenance of other terms over any long period of time may be small.
Caa = Poor standing; may be in default or may have danger with respect to principal or interest.	"caa" = Likely to be in arrears on dividend payments; does not rule out future dividend payments.
Ca = Speculative in a high degree; may be in default.	
C = Lowest rated bonds; extremely poor prospects of ever attaining real investment standing.	

These ratings may be modified by the addition of a plus or minus sign to show relative standing within the major rating categories.

APPENDIX III

FORECASTING GPU'S COST OF COMMON EQUITY

COST OF EQUITY CAPITAL DEFINED

The cost of equity capital is essentially the total rate of return required by investors in the common stock. That required rate of return on their investment is a function of the risk those investors perceive in that investment and of the state of the economy. Furthermore, the required rate of return on investment, and thus the cost of equity capital, depends on investors' perception of the overall risk of the company rather than any particular aspects of the company's risk position.

The cost of equity is the cost of all equity funds, whether those funds are used for cleaning up Units I and II, maintaining distribution systems which have nothing to do with TMI, or even building new nuclear plants. In other words, the costs that have been estimated at this point are for all of GPU's equity funds, without regard for the particular uses to which those funds are to be put. Of course, the current, relatively high cost of equity is a result of investors' awareness of the TMI accident and the ensuing clean-up costs, but those clean-up costs cannot be separated from other applications of funds and assigned a separate cost of capital.

GPU'S COST OF EQUITY CAPITAL APPLIES TO EACH OPERATING SUBSIDIARY

It is important to note that the cost of equity for GPU is a function of the investment risk of GPU in its entirety rather than of any one of its operational units. The overall risk of the parent is determined by the risks of the subsidiaries and the way in which those risks interact in combination. Investor's perception of risk will be for the parent company, GPU, and will be an expression of the net risk of all the subsidiaries acting together.

The intrinsic cost of equity of GPU subsidiaries cannot be empirically estimated because they do not have publicly traded common stock. Each subsidiary may contribute more or less than the average contribution of risk to the parent, but the measurement of such risk contribution is difficult. Therefore, the cost of GPU's equity is properly assigned as the cost of equity for each of the operating subsidiaries.

Finally, it should be noted that the cost of equity plays an important role in the financial integrity of any company. Just as GPU must earn a return sufficient to pay its interest and preferred dividends, it must also earn on its equity capital a rate of return, on average over a period of time, at least equal to its cost of equity capital. If it fails so do so over an extended period of time, it will be unable to obtain additional equity capital for either expanding or maintaining its plant and its service. In the short run, stockholders may bear the penalties of an inadequate return, but in the longer run, if the return is not adequate to reward investors for their perceived risk, then they will not continue to supply additional capital.

GENERAL METHODOLOGY: USING THE DISCOUNTED CASH FLOW MODEL TO DETERMINE THE COST OF COMMON EQUITY

The Discounted Cash Flow (DCF) model is the most appropriate for inferring from objective market data the cost of equity capital because: (1) it is consistent with the objectives and principles articulated in the HOPE (230 U.S. 591) and BLUEFIELD (262 U.S. 679) decisions of the U.S. Supreme Court, which decisions form the basis for present regulatory treatment of the cost of capital; (2) the model is founded on sound and generally accepted concepts of economic behavior; and (3) its application encourages the analyst to be explicit regarding the data, computations, and assumptions used in the analysis.

The costs of debt and preferred stock are contractual in nature and can be observed directly. The cost of a bond is the yield to maturity of its interest coupons and the amount due at maturity. The cost of preferred stock is the required dividend payment.

However, the cost of common equity cannot be observed since there is no contractual obligation for the issuers to pay any set amount of common dividends. Instead, the cost of equity, or the rate of return on investment necessary to induce investors to invest in that common stock, must be inferred from the actions of investors in the market.

The total rate of return on an investment in common stock is the present value of all future dividends plus the expected future sales price, divided by the purchase price. Given an expected stream of dividends during

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the period the stock will be held and an expected sale price at the end of that holding period, the investor can adjust the total rate of return to equal or exceed his required rate of return simply by paying the appropriate price for the stock. Thus, if we know, or assume, investors' expectations regarding dividend streams and future sales price, their required rate of return for a particular investment can be inferred from the price established in the market.

The DCF model embodying these basic concepts is developed algebraically as follows. 1/ In the DCF method we seek to infer the rate of return that recent investors have implicity attributed to a particular stock or group of stocks. That is, the market price at any time will reflect the implicit discount rate of those investors who trade the stock at that time. It is the rate of return that currently is sufficient to induce those people to invest in the equity stock.

Specifically, as shown in Equation 1, the current market price, p_o , of a share is found by discounting at rate, k, the stream of dividends, d_n, and the sale price of the share after n time periods, p_n.

(Eq. 1)

$$P_o = d_1/(1+k) +...+ d_n/(1+k)^n + P_n/(1+k)^n$$

Now, if we assume that dividends will grow at a constant rate per period, g, each of the dividends can be expressed as a product of the current dividends, d_o, as follows:

(Eq. 2)

$$P_o = d_o(1+g)/(1+k) +...+ d_o(1+g)^n/(1+k)^n + P_n/(1+k)^n$$

Rewriting equation 2:

1/See Jack Clark Francis, Investments: Analysis and Management, 3rd Edition, New York: McGraw Hill Book Company, pp. 264-288

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(Eq. 3)

$$P_o = d_o(1+g)/(1+k) + \ldots + d_o(1+g)^n/(1+k)^n + d^o(1+g)^{n+1}/(1+k)^{n+1} + d_o(1+g)^{\infty}/(1+k)^{\infty}$$

If we further assume an infinite planning horizon, equation 3 can be simplified to:

(Eq. 4)

$$P_o = d_1/(k-g)$$

Which can be rewritten:

(Eq. 5)

$$k = (d_1/P_o) + g = (d_o(1+g)/P_o) + g$$

Equation 5 tells us that "k", the investor discount rate, or required rate of return, or cost of equity, equals the current dividend yield projected one period forward plus the rate of growth of dividends. The current dividend yield is known and the growth rate, g, can reasonably be projected from historic dividend data.

Alternatively, if we assume continuous compounding, Equation 3 may be rewritten as:

(Eq. 6)

$$k = (d_o/P_o) + g$$

Equation 6 days that the current investor discount rate is given by the current dividend yield plus the rate at which dividends are expected to grow.

The final form of the model says that the investor's required rate of return, or the investor discount rate, is equal to the current dividend yield plus the expected future growth rate of dividends.

METHODOLOGY OF THIS STUDY

With regard to the specific task of estimating GPU's cost of equity capital for each of the years 1980-1984, the following questions must be answered. Given that the very concept of cost of equity implies an empirical

determination from market data that are inherently historical in nature, how can a forecasted cost of equity be estimated?

Regarding this question, the cost of equity is properly inferred from market data which result from the pricing decisions of investors. Unfortunately, market data cannot be measured prospectively. Also, the cost of equity depends not only on the perceived risk of investment in a company's equity but also on economic conditions in general and interest rate levels in particular at the time the investment is made. Since future costs of equity clearly will depend on future economic conditions, forecasted costs of equity must be based on forecasted economic conditions.

Various economic indicators are regularly forecasted by firms such as Chase Econometrics, Data Resources,Inc., and Wharton Econometric Forecasting Associates. For example, Chase Econometrics forecasts the Federal funds rate, 91-day Treasury bill rate, 4-6 month commercial paper rate, prime commercial bank rate,and the AA utility bond rate. Wharton and Data Resources each forecast a larger number of similar series.

The component of the DCF model sensitive to the level of interest rates is dividend yield. Projections of GPU's cost of equity could be made using the DCF model if GPU's dividend yield (currently zero because GPU has suspended dividends) could be estimated as a function of forecasted interest rates, as expressed by one or more of the series regularly forecasted by the firms mentioned above.

Investors' long term growth expectations should be sensitive to temporary economic conditions; growth rates are much more stable over time than are dividend yields. Hence, growth expectations which are reasonable today are probably close to those likely to be held by investors during the 1980-84 forecast period.

Assumptions used in forecasting GPU's cost of equity

GPU's future cost of equity was estimated using the DCF model and the following assumptions:

a) Future dividends yields will equal forecasted AA utility bond yields plus a risk premium,

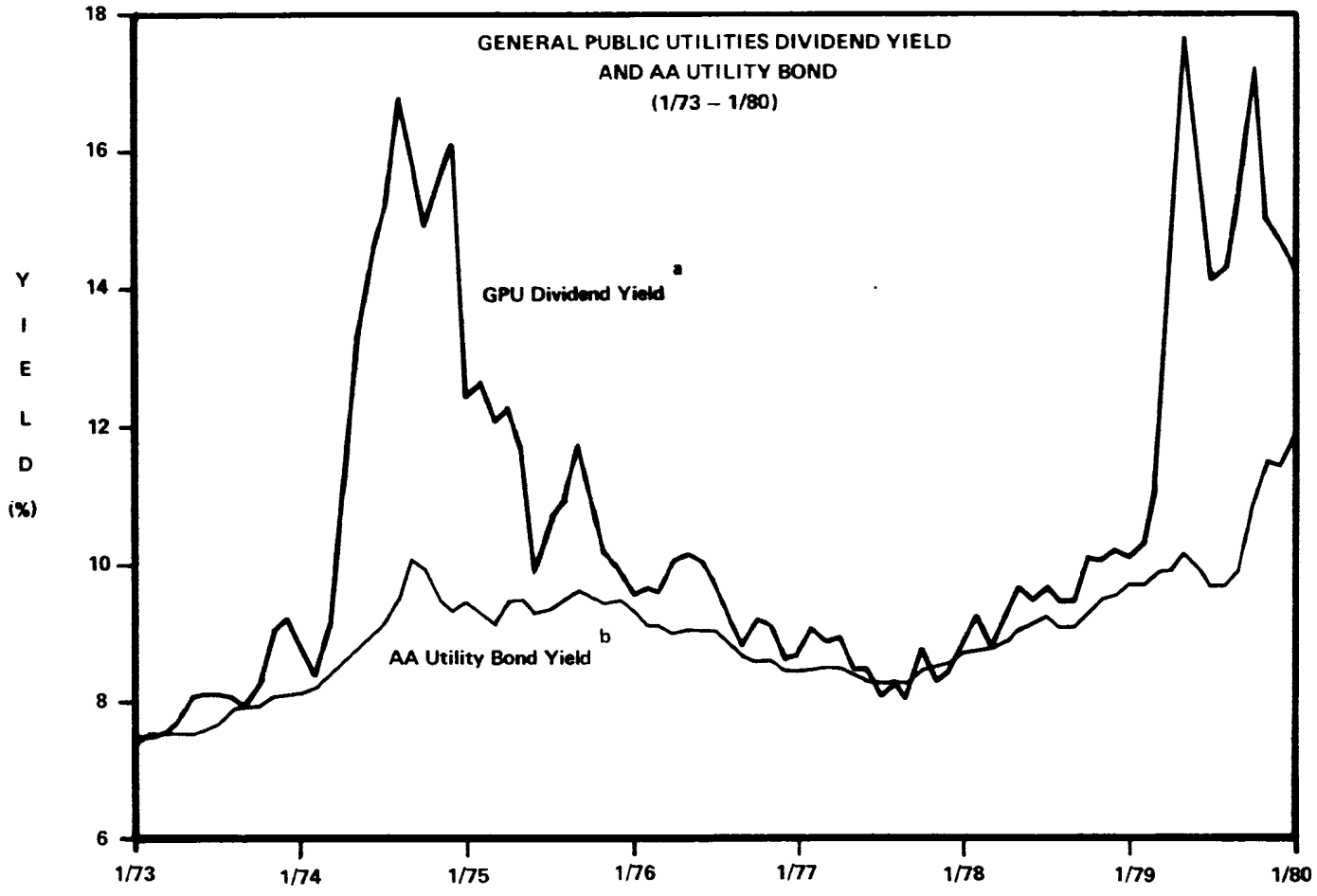
APPENDIX III

b) Future dividend growth is equal to the historical average dividend growth, and,

c) Risk premiums will decline over the five year forecast period.

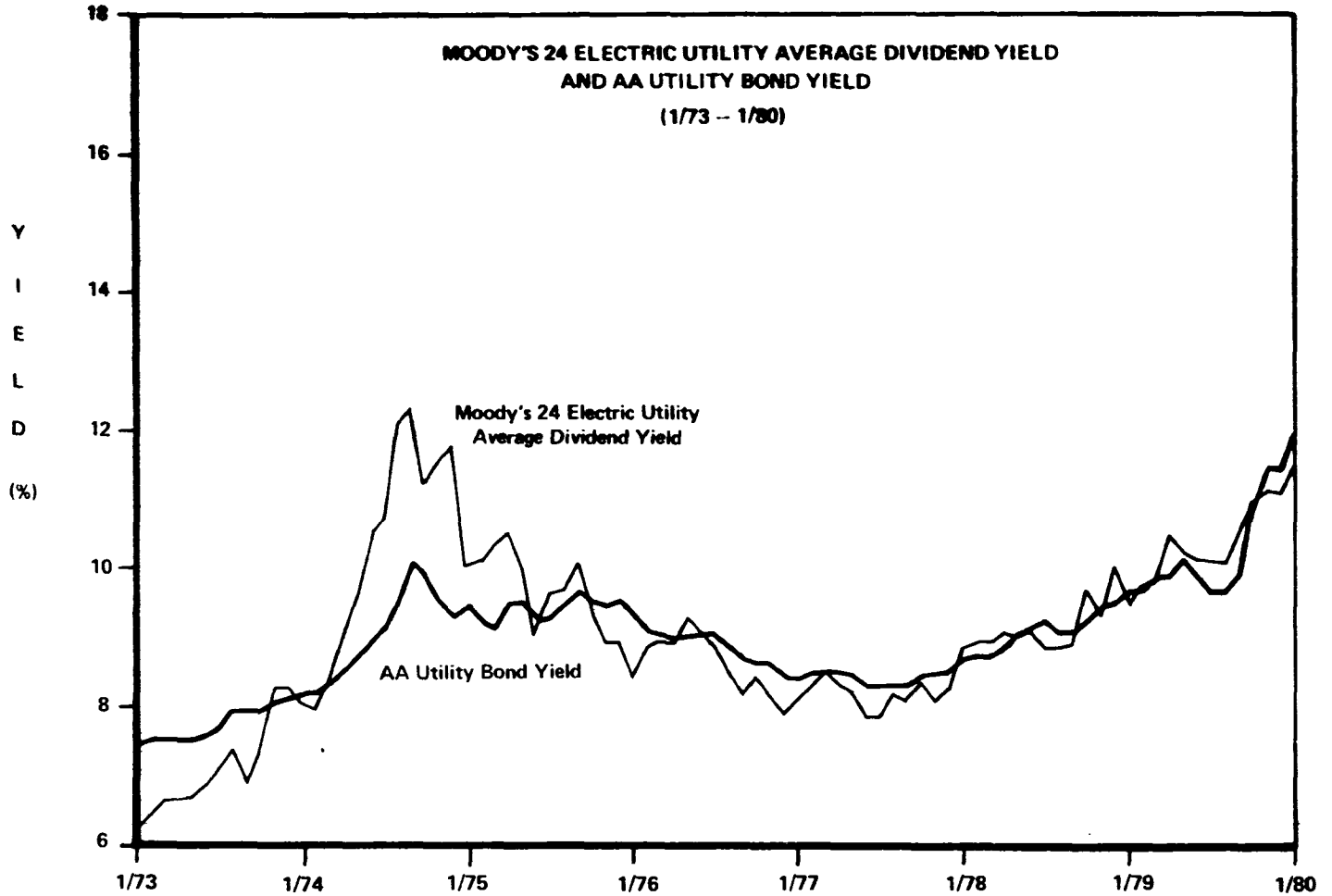
Exhibit A presents three graphs (A-1, A-2, A-3) showing, for each month from January 1973 through January 1980, GPU's dividend yield, the average dividend yield of Moody's 24 electric utilities, and the average of Moody's AA utility bond yields. Those graphs,and the ones in Exhibits B, C, D, and E, show clearly that during about half the 7 years (1973-79) the three series followed nearly the same pattern and were at nearly the same level. Of particular interest is the apparent difference in the reaction of GPU's dividend yield and the AA bond yield to two financial crises--one at the beginning and the other at the end of the 7 years.

EXHIBIT A-1



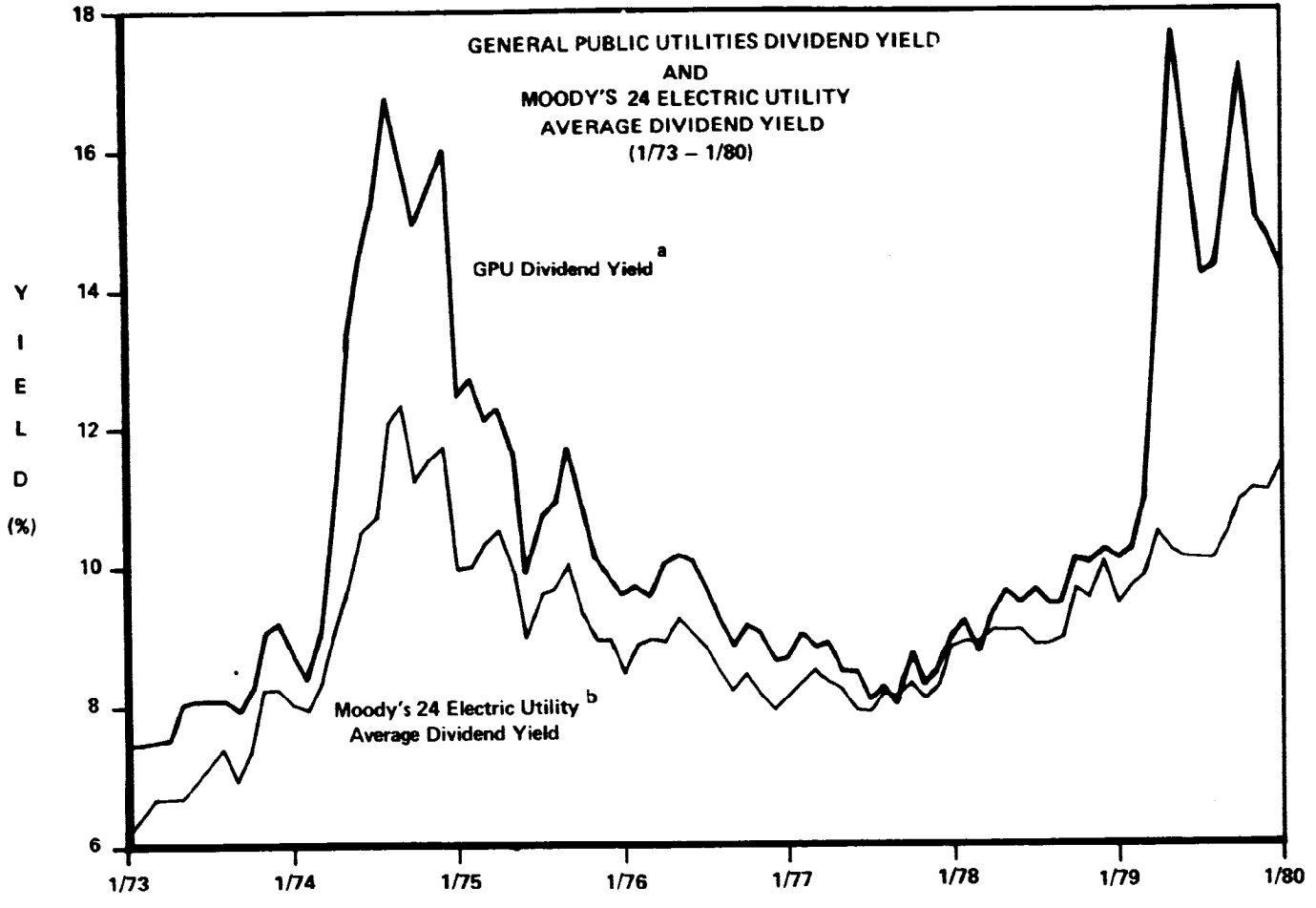
SOURCE: [a] Barron's
[b] Moody's Public Utility Manual, 1979 and Moody's Public Utility News Reports

EXHIBIT A-2



SOURCE: Moody's Public Utility Manual, 1979 and Moody's Public Utility News Reports

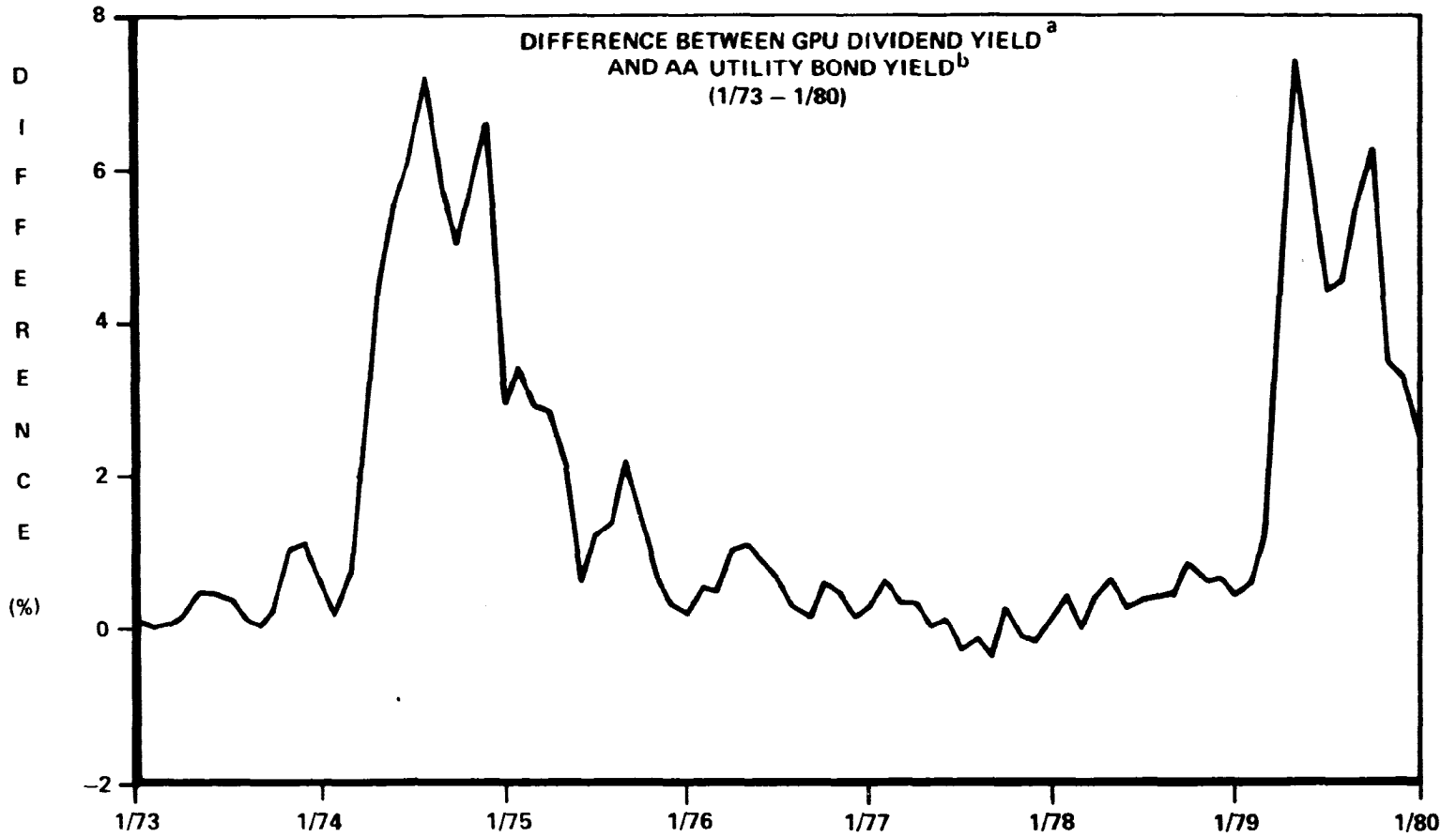
EXHIBIT A-3



SOURCE: [a]Barron's

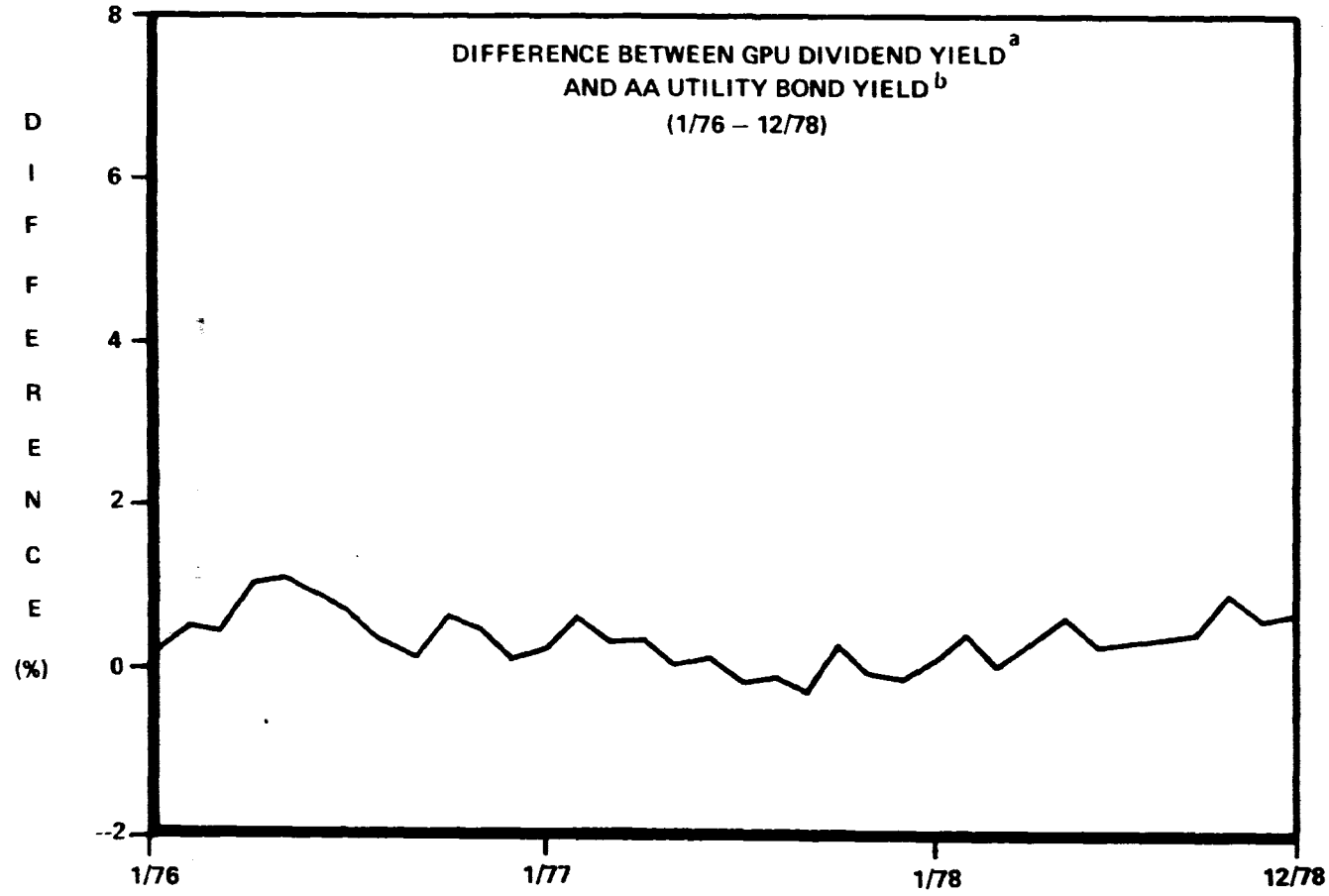
[b]Moody's Public Utility Manual, 1979 and Moody's Public Utility News Reports

EXHIBIT B



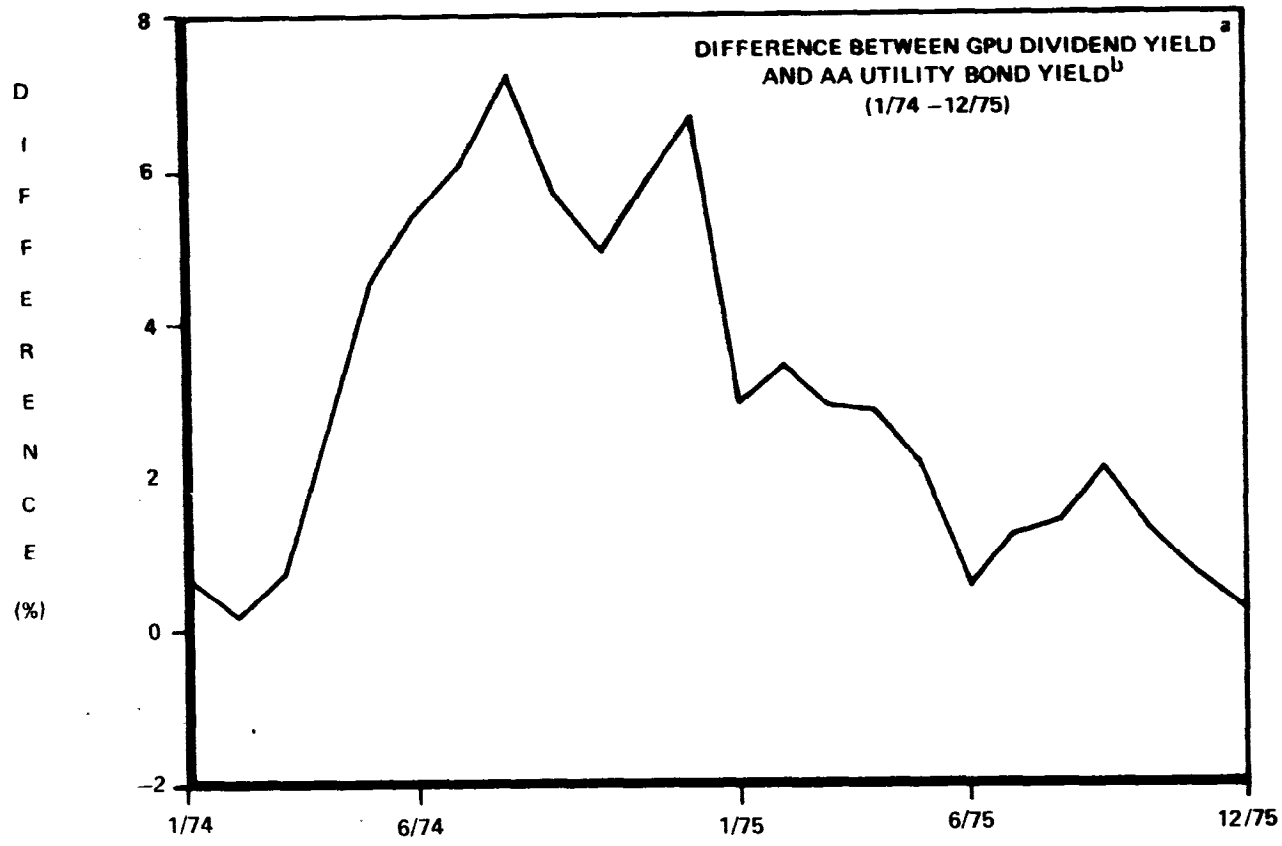
SOURCE: [a]Barron's
[b]Moody's Public Utility Manual, 1979 and Moody's Public Utility News Reports

EXHIBIT C



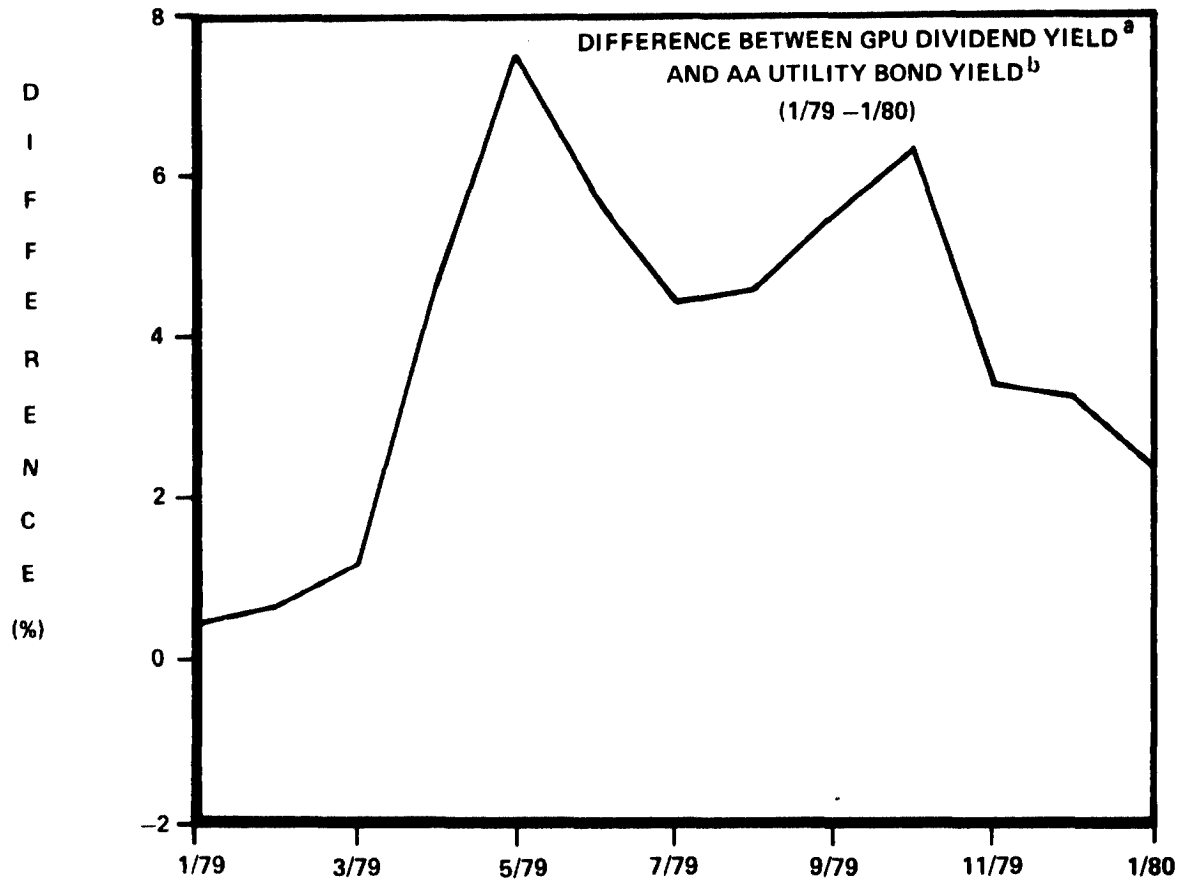
SOURCE: [a]Barron's
[b]Moody's Public Utility Manual, 1979 and Moody's Public Utility News Reports

EXHIBIT D



Source: [a]Barron's
[b]Moody's Public Utility Manual, 1979 and Moody's Public Utility News Reports

EXHIBIT E



SOURCE: [a]Barron's

[b]Moody's Public Utility Manual, 1979 and Moody's Public Utility News Reports

APPENDIX III

GPU's dividend yields closely follow AA utility bond yields

The shock of the Oil Producing and Exporting Countries oil embargo of 1974-75 caused the dividend yield of GPU to jump to about 7.5 percentage points above the AA utility bond yield. Moody's 24 electric utility average yield also increased, but less dramatically. GPU's yield then gradually declined to approximately the level of the AA bond yield, and during the 1976-78 period, GPU's dividend yield very closely followed the AA bond yield of the Moody's 24 electric utility average.

Following the TMI accident in March 1979, GPU's dividend yield again shot up about 7.25 percentage points above the AA bond yield,and then gradually declined to about 2.8 percentage points above the AA bond yield by the end of 1979. Of course, since GPU's dividend omission there has been no dividend yield to measure or to compare to AA bonds yields or any other financial series.

GPU's future growth rate assumed to equal its average historical growth rate

During the 1976-78 period when GPU's dividend yield closely followed the AA utility bond yields,it is very likely that investors expected a future growth rate of about 1 to 2 percent. Analysis of historic growth rates during the years preceeding 1976-78 shows that GPU had growth rates of dividends, earnings, and book value between 1 and 2 percent, but with many negative rates (see Exhibits F, G and H). After the events of 1979 it is unlikely that investors would now, or for the foreseeable future, expect growth rates for GPU to exceed the 2-percent level. In fact, GPU's own projections for 1982-84 are for level annual dividend payments of about one dollar per share, nearly half the pre-TMI rate.

Although there clearly is little prospect of dividend growth during the five-year forecast period, it is possible that by the end of that period (say 1983 or 1984) investors once again may expect modest dividend growth. We assume investors will expect, during each of the forecast years, a future (from that year on) dividend growth rate of between 1 and 2 percent. This assumed average growth rate of 1.5 percent for GPU compares with an electric utility industry average annual historic growth rate in the 3- to 4-percent range.

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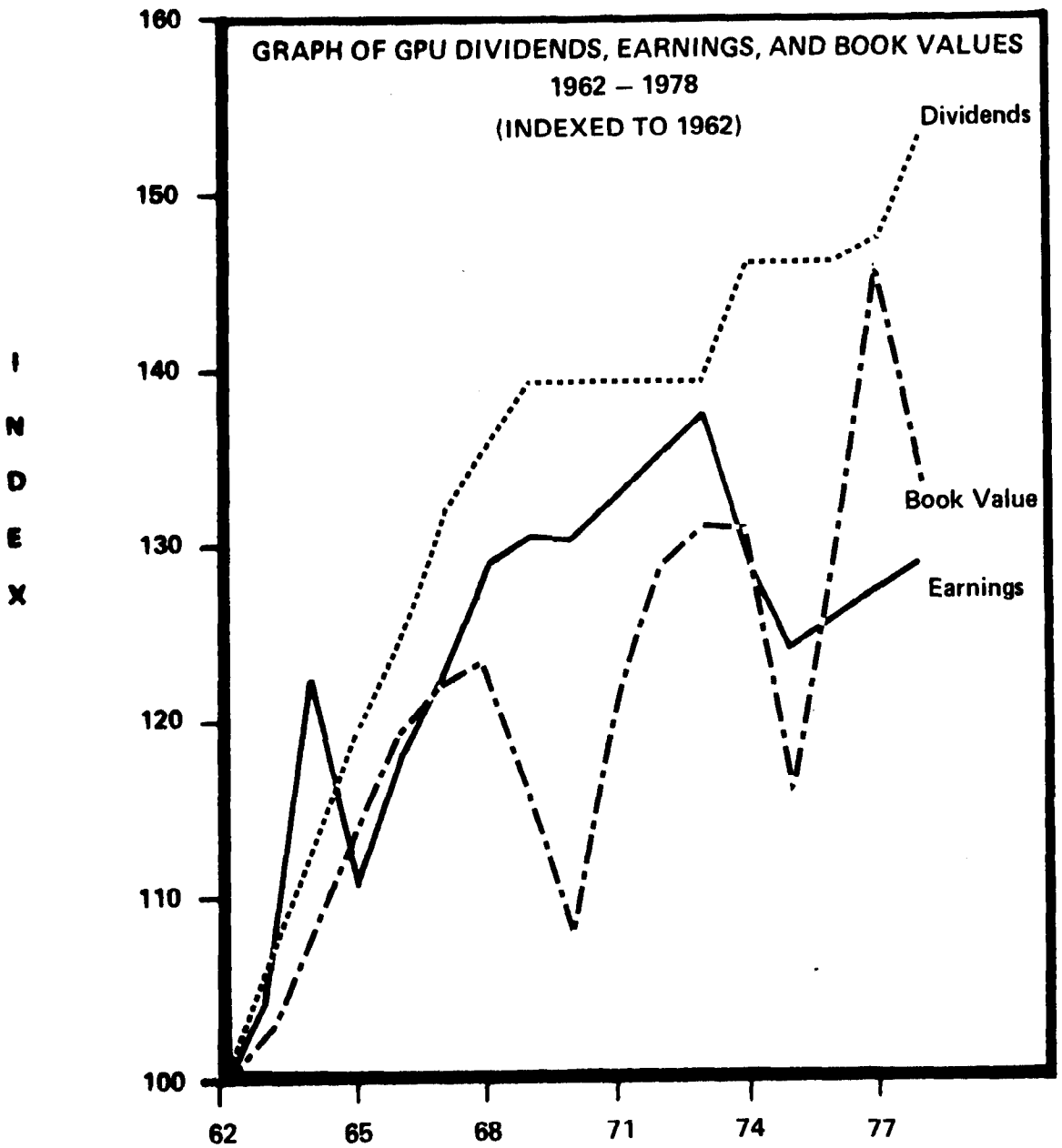
Exhibit F

GPU Dividends, Earnings, and Book Values (1962-1978)

Year	Declared Dividends	Earnings	Book Value
1962	1.15	1.71	14.96
1963	1.22	1.75	15.57
1964	1.3	1.85	18.33
1965	1.37	1.95	16.71
1966	1.43	2.04	17.78
1967	1.52	2.09	18.34
1968	1.57	2.11	19.21
1969	1.6	2.	19.56
1970	1.6	1.83	19.5
1971	1.6	2.08	19.81
1972	1.6	2.21	20.31
1973	1.6	2.25	20.51
1974	1.68	2.25	19.37
1975	1.68	2	18.6
1976	1.68	2.2	18.81
1977	1.7	2.5	19.04
1978	1.77	2.3	19.19

Source: Value Line Investment Survey.

EXHIBIT G



SOURCE: Value Line Investment Survey

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EXHIBIT H

HISTORIC GROWTH RATES

GROWTH RATES (%) THROUGH 1978:

From:	DIVIDENDS	EARNINGS	BOOK VALUE
1977	4.04	-8.33	0.78
1976	2.61	2.22	1.00
1975	1.68	5.47	1.06
1974	1.16	2.67	0.05
1973	1.54	1.49	-1.06
1972	1.51	1.10	-1.24
1971	1.38	1.35	-1.00
1970	1.22	2.23	-0.72
1969	1.07	2.07	-0.56
1968	1.03	1.65	-0.36
1967	1.09	1.38	-0.05
1966	1.29	1.25	0.24
1965	1.51	1.26	0.59
1964	1.74	1.37	0.57
1963	1.99	1.53	0.91
1962	2.25	1.66	1.20

GROWTH RATES (%) THROUGH 1977:

From:	DIVIDENDS	EARNINGS	BOOK VALUE
1976	1.18	12.78	1.22
1975	0.59	11.15	1.17
1974	0.36	4.11	-0.40
1973	1.21	1.88	-1.78
1972	1.28	1.23	-1.77
1971	1.17	1.52	-1.32
1970	1.08	2.58	-0.89
1969	0.89	2.31	-0.65
1968	0.88	1.75	-0.39
1967	0.98	1.41	-0.02
1966	1.23	1.26	-0.31
1965	1.49	1.27	0.70
1964	1.75	1.39	0.67
1963	2.04	1.57	1.04
1962	2.32	1.71	1.35

GROWTH RATES (%) THROUGH 1976:

From:	DIVIDENDS	EARNINGS	BOOK VALUE
1975	0.00	9.53	1.12
1974	0.00	-1.12	-1.46
1973	1.46	-1.85	-3.00
1972	1.46	-1.26	-2.51
1971	1.25	-0.05	-1.65
1970	1.05	1.76	-1.00
1969	0.87	1.62	-0.68
1968	0.86	1.10	-0.36
1967	0.98	0.82	0.08
1966	1.28	0.74	0.45
1965	1.57	0.84	0.89
1964	1.87	1.05	0.82
1963	2.18	1.31	1.22
1962	2.48	1.50	1.55

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Risk premium is expected to decline over the forecast period

As previously described, investor response to two previous financial shocks--the oil embargo and TMI--was to require a premium for GPU's dividend yield relative to the AA utility bond yield. GPU's dividend yield premium had already declined from its post-TMI high of 7.48 percentage points to less than 3 percentage points at the time GPU suspended its dividend. The dividend suspension undoubtedly constitutes an additional shock which likely will serve to increase the yield premium investors require once the dividend is reinstated. However, judging from past behavior, we can expect the dividend yield to fall gradually back toward the AA utility bond yield level as GPU solves its TMI problems and moves toward a more normal operating condition.

To reflect this anticipated investor behavior, GPU's forecasted yield will be estimated by adding a gradually declining premium to the forecasted yields of AA utility bonds. A yield premium of 4 percentage points is assumed for 1980, 2 percentage points for 1981, 1 for 1982, and 0.4 for both 1983 and 1984. The latter premium is the average difference between GPU's yield and the AA yield during the 1976-78 period. The assumed premium of 4 percentage points in 1980 is somewhat higher than the average premium during the 1979 post-TMI period.

Calculation of the cost of equity

The AA utility bond yields forcasted by Chase Econometrics and Data Resources, Inc. are shown in Exhibit I. Also shown are a low estimate for expected growth of 1 percent and a high estimate of 2 percent. For each year, combining the low AA bond yield forecast with the yield premium and the low estimate of growth produces the low forecast of GPU's cost of equity. A high estimate is analogously calculated. To avoid conveying the impression that the forcasts are highly precise, the forecasted costs of equity have been rounded to the nearest whole percentage point.

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Exhibit I

Forecasted Yields, Growth Rates, and Cost of Equity (COE) General Public Utilities

Year	Yield Premium	Low Growth	High Growth	Chase est. a/	DRI est. b/
1980	4.0	1.0	2.0	13.38	13.28
1981	2.0	"	"	12.65	12.32
1982	1.0	"	"	12.12	12.49
1983	0.4	"	"	11.60	12.54
1984	0.4	"	"	10.28	12.16

Year	Low COE est.	High COE est.	Mean COE est.	Rounded COE est.
1980	18.28	19.38	18.83	19.00
1981	15.32	16.65	15.98	16.00
1982	14.12	15.49	14.81	15.00
1983	13.00	14.94	13.97	14.00
1984	11.68	14.56	13.12	13.00

Source: a/Chase Econometrics, U.S. Macroeconomics Forecasts and Analysis, First Quarter 1980.

b/Data Resource, Inc., Spring 1980.

We have not attached any measure of confidence to the forecasts; we note only that all forecsts have some uncertainty associated with them, and that in recent years economic forecasting has not had a particularly good record. However, even though a particular forecast may not--indeed, doubtless will not--be entirely accurate, the task at hand nevertheless requires that a forecast be used. Just as assumptions used in models may not be entirely accurate or realistic, the best assumptions must be used if the best decision is to be made; so, too, the best forecasts are better used than none at all.

It should be noted that the Chase and Data Resources forecasts are in fairly close agreement through 1982, after which they diverge for 1983 and 1984. Such a situation is not surprising since the longer the forecasting horizon, the more the uncertainty and the greater the effects of differing assumptions.

The net result of the analysis is that our best estimates of future costs of equity for GPU are:

Year	Estimated GPU cost of common equity
1980	19%
1981	16
1982	15
1983	14
1984	13

(309332)

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