General Public Utilities Corporation
Pennsylvania Operations

Management and Operations Study

Commonwealth of Pennsylvania
Public Utility Commission

September 1980

Theodore Barry & Associates
A TB&A Group Company

Los Angeles • New York • Atlanta • Chicago • Portland • Washington, D.C.

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I - INTRODUCTION

In September 1979 the Pennsylvania Public Utility Commission (PUC or the Commission) requested proposals to conduct a comprehensive management and operations study of Metropolitan Edison Company (Met-Ed), Pennsylvania Electric Company (Penelec) and General Public Utilities, Inc. (GPU or the Company). The request stated that the study would be performed in two phases. The first phase (Phase I) would consist of two components. One component would be a broad but comprehensive review of the management and entire operations of the company. While the scope of this review would be broad, its depth would be sufficient to identify significant cost savings, improvements in management methods or service to customers. The second component would be an in-depth analysis of the specific objectives detailed below. These analyses would be sufficient to provide responsible opinions, judgments and recommendations for specific changes together with projected costs and potential savings, if any. These analyses would also assist the Commission in carrying out its regulatory responsibilities.

The second phase (Phase II) would consist of in-depth analyses of areas where cost savings and potential improvements warrant a more detailed investigation than could be conducted during Phase I and the development and implementation of those programs and systems identified in Phase I that are authorized by the Commission This authorization will follow the Commission's consideration of the recommendations in the Phase I report and a cost/benefit analysis of each proposed program.

In November 1979, Theodore Barry & Associates (TB&A) was selected to perform the study. The audit began on December 17, 1979. This report presents the results of Phase I. This chapter outlines the objectives and scope of the study, the approach and methodology used, an overview of GPU operations and the organization of this report.

OBJECTIVES AND SCOPE

The overall objectives of this study included the determination of what improvements, if any, could be accomplished in the management and operations of GPU and, specifically, which, if any, cost saving measures could be instituted. The ultimate purpose was to explore all economically practicable opportunities for providing ratepayers with lower rates and/or better service.

In addition, as requested by the PUC, the following specific objectives were to be addressed:

- Review the prior management and operations study of GPU and the prior review of the construction management of TMI 2 to become aware of the major issues developed during these studies. These reports were used as a starting point to identify the substantive issues early in the review and to isolate the recommendations made in these studies that have not been implemented.

- Review the financial condition of GPU and address the following specific questions:

  - o What is the current and prospective financial condition of GPU assuming the continued unavailability of nuclear units TMI 1 and TMI 2?

  - o Has the Company considered and actively pursued all possibilities for the procurement of capital?

- Conduct a detailed review of the Company's efforts to find economical replacement power and note the successes and failures.

- Examine the management actions and decisions involved in the following, in order to make a determination as to the adequacy of the past and present management of Met-Ed:

  - o The construction, maintenance and operation of TMI 2

  - o The NRC modification order on TMI 1

  - o The actions and responses of Met-Ed during the PUC hearing. The Commission order as a result of this hearing was part of the RFP. This order addressed the very complex issues concerning who should pay for the costs of the accident.

- Examine customer service and other related issues developed as a result of interviews with the Director of the PUC's Bureau of Consumer Services.

In addition to the overall and specific objectives cited above, TB&A suggested the following sub-objectives:

- Evaluate management of major operations and determine how efficiently Company resources are being used, if adequate and effective policies and procedures are in force and being consistently followed, and what improvements, if any, can be instituted by the Company.

- Identify areas in which management and operational practices can be strengthened and in which cost benefits can be realized, and make recommendations for specific practical actions that will achieve these benefits.

- Evaluate the effectiveness of the organization of GPU to optimally allocate management time, material and capital resources.

- Identify and assess major external factors which may be contributing to present or potential management problems, and recommend improvements which the Company could make in carrying out its external relations responsibilities, and in responding to these factors.

- Provide a vehicle for improving the credibility and relationships of the Company and the PUC with political entities, with the press, with customers, and with the money markets by preparing an accurate and well-balanced report on management and operations. The report should put company performance in proper perspective, and describe strengths, as well as areas for improvement.

There are many operational and financial ties between Met-Ed, Penelec, GPU and JCP&L. These include the construction and ownership of power plants, energy exchange and purchase agreements, cross-loan guarantees, financial and cost allocation practices and executive level organization and decision making. The scope of the study included all functional areas of Met-Ed, Penelec and GPUSC. This study did not examine the management and operations of JCP&L, but it did examine financial and operational interfaces among all GPU operating companies and the service company.

APPROACH AND METHODOLOGY

From mid-December 1979 through September 1980 TB&A consultants spent almost four man-years of effort on the Phase I elements of the management and operations study of Metropolitan Edison, Pennsylvania Electric Company, and General Public Utilities. TB&A's initial proposal outlined a comprehensive review for each of the Company's functional areas. Subsequent to initial interviews with GPU's senior management and upon completion of a review of relevant prior studies, TB&A refined its work plan to focus on these areas of major concern expressed by the Pennsylvania Public Utility Commission. Following review and approval by the PUC's Bureau of Audits, TB&A proceeded with the detailed technical work, which was conducted in two stages.

The first stage encompassed a reconnaissance of each functional area to develop findings for use by the PUC in the rate proceedings involving Met-Ed and Penelec in Docket No. 1-79040308. Because of the critically of these proceedings, the PUC Bureau of Audits requested TB&A to:

- Conduct on orientation of major functional areas to obtain first-hand knowledge of the needs of the Commission and the details of the problems facing Company management;

- Perform more in-depth reviews of certain areas identified by Commission staff;

- Provide input to the Commission in its deliberations; and

- Finalize a work plan for the remainder of Phase I activities.

TB&A's findings and conclusions were filed as testimony on March 4, 1980.

Subsequent to providing testimony, TB&A initiated the second stage of the Phase I work. Prior to undertaking this portion of the study, the work plans were revised to reflect recent developments and the particular concerns of the PUC. The major elements of this second stage of the work program consisted of a continuation of the review of nuclear and financial issue, an analysis of the characteristics of GPU's energy position and a review of the Company's proposed management combination and division consolidation of the Pennsylvania operating companies.

Throughout the course of the Phase I work, TB&A staff interviewed corporate personnel and managers in each functional area, reviewed documentation regarding policies, procedures, and implementation plans already underway, and visited most major corporate facilities. Interviews were also conducted with Commission staff members, the NRC, the SEC, the Lieutenant Governor of Pennsylvania, representatives of the Company's legal firms, representatives of the investment community including banks, investment firms and rating agencies and representatives of other interested parties such as Johnstown Area Regional Industries (JARI).

After completion of the data gathering, TB&A staff analyzed and evaluated GPU's operations to develop a profile of the Company. Corporate documents, reports from other utility companies, and TB&A's research materials formed the basis for the development of preliminary findings, conclusions and recommendations. The preliminary findings and conclusions were verified with appropriate levels of management and subsequently incorporated into presentations to the Commission staff. A draft copy of this report was then prepared for review by the Commission staff and subsequently by GPU prior to the issuance of this final report. As a result of the review process, the findings and conclusions in the report are based on facts which are accurate to the best knowledge of GPU management, the Commission's Bureau of Audits, and TB&A personnel. The findings, conclusions, and recommendations presented in the report are TB&A's and are not necessarily shared by GPU management or the Commission's staff, except as noted.

COMPANY OVERVIEW

General Public Utilities Corporation (GPU) is an electric utility holding company that provides electricity to some 4 million people living in New Jersey, Pennsylvania and a small part of New York State. It distributed more than 30 billion kilowatt-hours of electricity in 1979. Of this total, approximately 34 percent went to residential customers, 23 percent to commercial accounts, and 37 percent to industry.

The GPU System includes three operating companies: Jersey Central Power & Light Company (JCP&L) in New Jersey and Metropolitan Edison Company (Met-Ed) and Pennsylvania Electric Company (Penelec) in Pennsylvania (See Exhibit-1). The System has total assets of $5 billion, making it the 14th largest of the nation's 210 Class A and B investor-owned electric utilities.

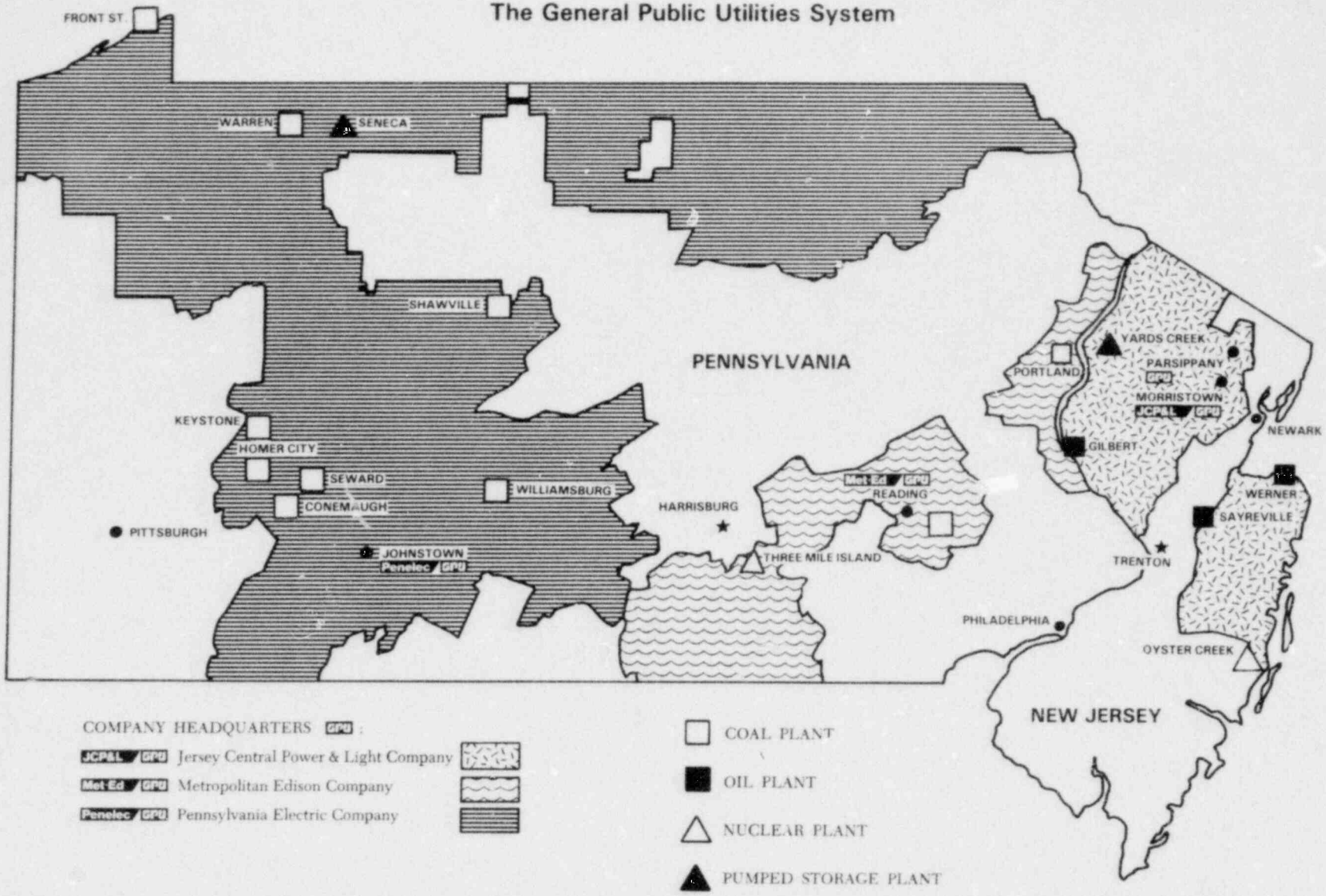
As a holding company, GPU has certain external considerations which are not shared by many other electric utility companies. Since GPU has operating companies which serve areas of three different states -- New Jersey, Pennsylvania, and New York -- it must of necessity deal with the respective regulatory bodies in each state. Due to the unique needs of each state the regulatory commissions do not necessarily operate in conformity and consistency with each other.

Both operating companies in Pennsylvania are subject to rate and other comprehensive regulation by the Pennsylvania Public Utility Commission (PUC). As subsidiaries of GPU, a registered holding company which holds all of the operating companies' common stock, both companies are subject to regulation by the SEC with respect to accounting, the issuance of securities, the acquisition and sale of utility assets, securities or any other interest in any business, the entering into and performance of, service, sales and construction contracts and other miscellaneous matters. Both companies are also subject to regulation by the Federal Energy Regulatory Commission (FERC) under the Federal Power Act as a company engaged in the transmission or sale at wholesale of electric energy in interstate commerce, and by the Nuclear Regulatory Commission (NRC) as part owners of the Three Mile Island (TMI) nuclear generating station.

The business of the operating companies consists predominantly of the generation, purchase, transmission, distribution and sale of electric energy. The GPU Service Corporation (GPUSC) provides management, financial, engineering, operating and administrative support services for the operating companies in the generation, power supply, transmission, distribution, administrative and general areas. GPUSC plans and supervises new construction work and is responsible for system-wide planning of power supplies, coordination of safety programs, centralized computer services, purchasing, stores, labor relations, wage and salary administration and insurance. The current organization structure of the overall CPU System is shown in Exhibit I-2.

Metropolitan Edison provides retail service in all or portions of four cities, 92 boroughs and 155 townships, located within 14 counties in the eastern and central parts of Pennsylvania, having an estimated population of 830,000. It also sells electricity at wholesale to five municipalities having an estimated population of 17,500, to an electric company serving substantially all of one township and to a rural electric cooperative corporation. Met-Ed's only subsidiary, York Haven Power Company, is the owner and licensee of the York Haven hydro-electric project.

The General Public Utilities System



POOR ORIGINAL

EXHIBIT I-1

Operating Companies' Statistics

Company	Revenues ($000)	Total Assets ($000)	Sales Mix			Customers–Year-End	Electric Sales (MWH)	Peak Load* (MW)	Fuel Mix		
			Residential	Commercial	Industrial				Coal	Oil & Gas	Nuclear
Jersey Central Power & Light	$ 664,947	$2,114,054	40%	27%	30%	690,889	12,770,989	2,548	19%	22%	59%
Metropolitan Edison	$ 338,136	$1,327,149	31%	19%	41%	358,265	8,084,033	1,533	76%	5%	19%
Pennsylvania Electric	$ 493,061	$1,496,576	28%	21%	44%	508,940	11,140,457	2,092	95%	1%	4%
General Public Utilities System	$1,490,154	$4,991,994	34%	23%	37%	1,558,094	31,995,479	6,173	67%	8%	25%

* *At time of GPU System peak.*

PRESENT CORPORATE ORGANIZATION STRUCTURE
OF GPU

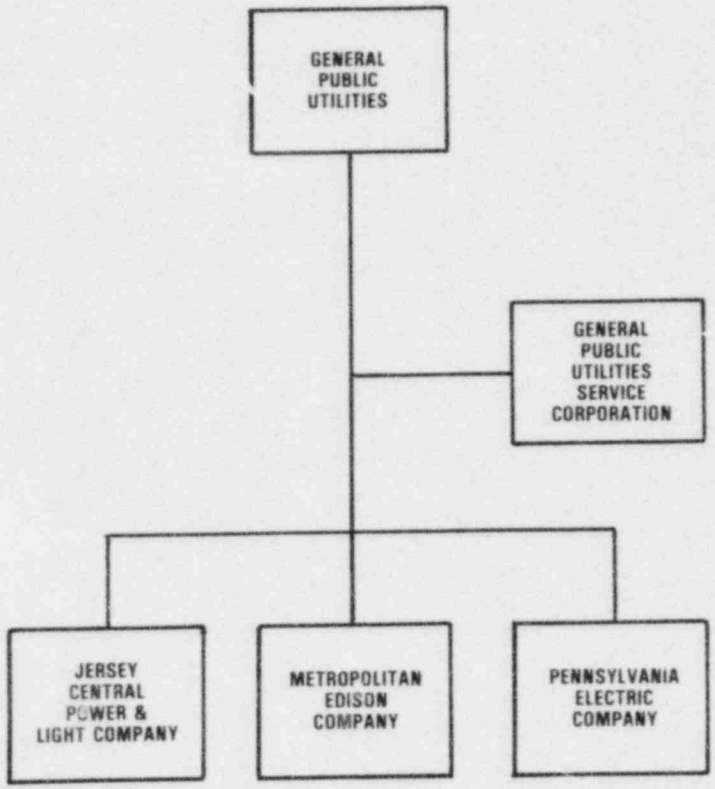


EXHIBIT I-2

Pennsylvania Electric Company provides electric service within a territory located in western, northern and south central Penn- sylvania, extending from the Maryland state line norther to the New York state line, with a population of about 1,500,000 approximately 30 percent of which is concentrated in ten cities and thirteen boroughs, all with populations over 5,000. Penelec, as lessee of the property of the Waverly Electric Light and Power Company, a wholly-owned subsidiary, also services a population of about 8,400 in Waverly, New York and vicinity. The Company's other subsidiary, Ninevah Water Company, which is also wholly-owned, supplies water to one of the Company's generating stations and to private customers in and around Seward, Pennsylvania.

The generating and transmission facilities of JCP&L, Met-Ed and Penelec are interconnected and are operated as an integrated and coordinated system. Major facilities of the integrated system are designed and installed on an over-all system basis to achieve maximum operating economy consistent with service reliability. The electric transmission facilities of the integrated system are also physically interconnected with neighboring non-affiliated utilities in Pennsylvania, New Jersey, Maryland, Ohio and New York. The Company is a member of the Pennsylvania-New Jersey-Maryland Interconnection (PJM) and the Mid-Atlantic Area Council, an organization providing coordinated review of the planning of electric utilities in the PJM area. The interconnection facilities are used for substantial capacity and energy interchange and purchased power transactions, as well as emergency assistance.

As of January 1, 1980, Met-Ed had 2,123 employees (excluding personnel associated with nuclear generation) and Penelec, 3,239 (excluding 781 on site staff at jointly owned plants). In addition to its wholly owned generation, Met-Ed is the operator for the jointly owned Three Mile Island nuclear plant. Penelec operates eight coal-fired plants, including one jointly owned with New York State Electric & Gas, two owned by a group of other PJM utilities, and two hydro plants. It also operates pumped storage and diesel facilities for joint owners. The employee totals include those devoted to operating facilities for other owners.

REPORT ORGANIZATION

This report contains six chapters and is organized as follows:

I INTRODUCTION - (this chapter)

II SUMMARY - presents an overview of the significant issues facing the Company and summary of strategic recommendations.

The review of the Company's operations is divided into the following four chapters. In each chapter, TB&A presents relevant background material, an analysis of key issues, and strategic recommendations.

III FINANCE

IV ENERGY

V NUCLEAR

VI ORGANIZATION

APPENDIX - provides a list of all recommendations contained in the report.

II - SUMMARY

This chapter summarizes the key issues and recommendations of Phase I of the Management and Operations Study of the Pennsylvania operations of General Public Utilities. It provides an overview and perspective of the Company, reviews certain key issues to provide an overall assessment and outlines recommendations that must be implemented.

OVERVIEW AND PERSPECTIVE

At the end of 1978 the future was promising for GPU, its ratepayers and investors. GPU is now a candidate to be the first major utility to go bankrupt since the Depression. Prior to the accident at TMI 2, GPU's finances were sound and improving. The commercial start-up of TMI 2 in December 1978 marked the completion of a major construction program which would provide the Company and its customers with an abundant source of low-cost energy. While it still faced major construction requirements in Pennsylvania and even more so in New Jersey, GPU had reached an enviable position relative to the rest of the electric utility industry, and to northeastern utilities in particular. It had a low-cost generation mix due to its higher than average nuclear capacity; GPU's production costs from internal generation, in 1978, were almost 7% lower than the national average and more than 15% lower than the average for other Pennsylvania companies.

The accident at TMI on March 28, 1979 precipitated a financial crisis that is without precedent for a utility company. The major players - GPU, the Pennslyvania PUC, the New Jersey Board of Public Utilities, the state legislators and governors, the Federal Government and the NRC - need to resolve the present financial predicament for the ratepayers, stockholders and creditors. Failure to do so presents a potential danger to public health and safety. The Company, while quick to perceive the immediate impact of the accident and respond effectively, has had difficulty in finding solutions to its long-term financial problems.

The Pennsylvania Public Utility Commission has conducted numerous public hearings to resolve key regulatory issues emanating from the accident. The Commission reached its decisions based on the information placed on the record by the Company, intervenors and its own staff. The Commission's decisions have rested on its needs to address various questions in light of regulatory law and precedent. The Commission's order of May 23, 1980 provided sufficient cash flow to maintain the solvency of the Company in the short-term. However, it now appears that uninsured costs to clean-up and restore TMI 2 may approach $1 billion and uncertainty exists as to where the funds will come from. Uncertainty also exists as to when the NRC will allow TMI 1 to return to service. The PUC's September 18, 1980 order has clarified its position that customer revenues cannot be used to finance the clean-up of TMI 2.

Without taking into account the regulatory constraints of the Commission, a different structure to the May rate order would have provided the same cash flow but with greater earnings and better coverage ratios without changing the level of rates charged to customers. In light of the Commis-

sion's recent order prohibiting the use of customer revenues to fund the clean-up, the absence of third-party funding for the clean-up and with GPU's lack of financial flexibility, few options to fund the clean-up of TMI 2 exist. Without adequate earnings and interest coverage, the Company cannot borrow funds in the amounts required over the next several years to continue providing reliable service to existing customers and to clean-up and restore TMI 2.

Six indisputable facts must be recognized to understand GPU's very real and pressing problems.

GPU Is In Great Jeopardy.

The Company's major short-term and long-term financial problems need to be resolved, and the possibility of bankruptcy or a major reorganization of the Company is far from remote.

The Problems Involved And The Solutions Required Are Complex.

There is a growing sense of frustration due to the inability of the institutions involved to improve the situation without adopting unpalatable alternatives. The Chairman of the Pennsylvania Commission has made strenuous attempts to convince the Federal Government that it has significant responsibilities and obligations. The Company has initiated severe cutbacks in many of its operations. However, no vehicle has surfaced to address the complex problems and provide for an orderly resolution to all of the issues arising from this crisis.

The following circumstances contribute to the problems:

- Fragmentation of responsibilities. The responsibilites of the key players (the Company, ratepayers, the NRC, investors, the banks, the SEC, the Commissions in both states, the Federal Government, and others) frequently conflict and overlap within the current regulatory, financial, and legal constraints.

- Institutional ennui. Considering that eighteen months have passed since the accident, the situation has not improved substantially. This environment fosters a feeling among the players of weariness and dissatisfaction with the process. It appears that the existing institutional framework is unable to resolve the problems.

- Public health and safety. The clean-up of TMI 2 must be completed as soon as practically possible. The plant appears to be in a stable condition and the Company has succeeded in releasing the Krypton gas and gaining entry into the containment building. However, the accident occurred 18 months ago and there are still hundreds of thousands of gallons of radioactive water in the containment building and a complex clean-up program is required.

- Public uneasiness. The continued escalation of rates, particularly the funding of purchased power costs, and questions of public health and safety contribute to the public's concerns.

- Limited options. The money to pay for the clean-up, purchased power and Company operations must come from somewhere. The only possible candidates are the ratepayers, the stockholders, the creditors, the state or Federal governments or perhaps the electric utility industry. Currently, Met-Ed's customer revenues are 25 to 30 percent higher than would have been the case if the TMI 2 accident had not occurred. These increases are largely attributable to replacement power costs. Stockholders have suffered paper losses approximating $775 million as the price of GPU's common stock has decreased from $18 to $5 a share. Shareholders have also lost more than $100 million as a result of dividend decreases and omissions. Met-Ed may be hard pressed to continue paying dividends on its preferred stock. The Company's liquidity continues to deteriorate thereby increasing the chance that an event of default will occur and trigger bankruptcy.

- Increased uncertainties. The return to service of TMI 1 and 2 are not just uncertainties, but unknowns. There is a growing awareness that the uncertainty surrounding when - if ever - they will return to service may be key.

The Problems Are Resolvable.

If the problems are not solved, in the near future, it will be because principles have prevailed over pragmatics. Given the appropriate regulatory assurances, and the return to service of TMI 1, GPU could finance all expected clean-up costs within the existing financial and regulatory framework. This is not to imply that the solution would be resolved without increased costs. However, even if the costs of clean-up and restoration of TMI 2 are $1 billion net of insurance, the revenues required will most likely be less than ten percent over current levels assuming TMI 1 is returned to service and costs are recovered over at least five years. The return to service of TMI 1 is a necessary step to relieving the financial needs of GPU and its customers.

Time Is Of The Essence.

The world of the practical will not wait for the resolution of conceptual issues. Financial markets can be quite unforgiving. Repairing the damage to GPU's financial viability will no doubt hinge on actions not intentions, results not efforts.

A Broad Perspective Will Be Necessary To Resolve The Problems.

The issues raised are questions of principle and policy. The issues take on greater meaning when viewed in terms of the role nuclear power plays in the nation's energy plans. One central question is whether the

NRC or the Federal government should be held accountable for the financial implications of their decisions. That is, are the costs of the continued outage of TMI 1 being fairly weighed, by the NRC and, if not, should it or the Federal government provide financial relief to GPU and its ratepayers?

OVERALL ASSESSMENT

This section reviews the results of TB&A's analysis of the key issues in four major areas:

- Finance
- Energy
- Nuclear
- Organization

These areas are expanded on in the subsequent chapters of this report.

FINANCE

The financial health of GPU cannot be restored overnight. Once earnings sufficient to satisfy miminum coverage tests are achieved, it could take another year before the Company will be able to access the public bond markets since bond indentures require that the coverage ratio be met for 12 out of 15 months. The PUC may have to resolve a conflict that has subsequently developed between two positions it has taken. On the one hand the PUC stated that it "will provide Met-Ed the means of financial rehabilitation," but on the other hand it has prohibited the recovery of clean-up costs from ratepayers. This position was developed when the uninsured amount was a relatively manageable $100 million (versus $1 billion today). Events have changed considerably since the Commission took these two positions. The uninsured clean-up costs are now so great that GPU cannot handle them without either rate relief or third-party funding.

The ultimate disposition of the TMI units and the Company's ability to recover its investment in Forked River, are still unknowns. Because the range of possible outcomes is so great, bankers, trustees and rating agencies who must make decisions about long-term commitments are unlikely to lend, invest or recommend investment of funds where preservation of capital and reliability of income from the investment are so unsure.

Besides the ratepayers, the only other candidates to fund the clean-up are either stockholders or a third party, such as the Federal Government, state government or a utility industry group. GPU's stockholders have already suffered massive losses from the severe decline in the market value of their holdings (GPU stock is selling at 25% of book value as of mid-1980 versus 85% for the industry) and from the discontinuance of dividends. It is unlikely that the Company will be able to issue new equity as long as it

warrants classification as a speculative investment. The continued erosion of the Company's equity base will also impair the Company's ability to issue bonds since bond investors require a minimum amount of equity "cushion" as a condition of lending. Although the Company has brought suit against Babcock & Wilcox, the designer/vendor of the damaged unit, it is unlikely that the suit will be settled before the clean-up costs require funding. The PUC has stated its belief that the Federal Government has an obligation to underwrite the clean-up costs on the basis that the Federal Government has pre-empted authority for the development of commercial applications of nuclear power and also that the increase in rates is an excessive burden on the Company's ratepayers. The White House has responded that is has no statutory authority to provide direct financial assistance to GPU and its ratepayers.

The average rates for Met-Ed and Penelec are not among the highest in the Northeast. Some combinations of events could result in much higher rates than at present. If ratepayers funded the clean-up costs, they could find that TMI 2 (or worse yet both TMI 1 and 2) will not be allowed to return to service. GPU's customers would then have paid almost $1 billion in clean-up costs only to be faced with continuing replacement power costs, which now total $325 million per year for both TMI 1 and 2 for the entire GPU system, and with non-productive investments valued at over $1 billion. If there were a high degree of assurance that both units would return to service, and that TMI 1 would return to service during 1981, the cost of funding the clean-up through rates might be a viable option.

If the projected $934 million in clean-up and restoration costs were funded entirely through rates on a current basis, the approximate impact on Met-Ed revenue requirements would be less than 10% above current levels, based on a full current payment of clean-up costs and reflecting an allowance for inflation. Alternatively, if the costs were to be financed and amortized over 20 years, the net increase could be very small. Without the return to service of TMI 1, however, the increase in revenues required to fund clean-up costs through rates would be in the range of 10% to 25% over current levels for Met-Ed depending on the rate-making treatment afforded various items.

One argument for payment by the Federal Government is the prolonged outage of TMI 1 due to the actions, or inactions, of the NRC. If the prolonged outage of TMI 1 relates to double standards applied to it by the NRC in comparison to other Babcock & Wilcox generation stations of like design and construction, the NRC might have a responsibility to compensate those affected financially by its actions. By the end of 1980, the additional cost required to purchase replacement power for TMI 1 alone will total almost $300 million.

While the NRC is not charged with responsibility for the financial viability of a company operating a nuclear generating station, it can withhold licensing if a company is not deemed financially sound. If GPU is not judged financially sound, then licenses to operate the TMI units must be withheld. Yet, it is the prolonged outage of both units - particularly TMI 1 - (plus the uncertainity relating to either or both returning to service)

that is seriously aggravating the Company's financial position. For each month that the undamaged TMI 1 remains out of service, GPU's ratepayers incur another $14 million in extra costs and stockholders must pay an additional $4.5 million in fixed charges (O&M, depreciation, interest and preferred dividends). Furthermore, the application of subjective rather than definitive criteria in deciding on the restart has created an environment in which it is difficult to assess the likely outcome.

There is the potential for a domino effect which could adversely impact this situation. If, for example, clean-up costs are ultimately determined to be unrecoverable through rates and no third party steps forward to pay for them, those costs would have to be written-off against stockholders' equity. The effect of writing-off $700 million (Pennsylvania's 75% share of $934 million net clean-up costs) against an equity base of $1.4 billion would reduce the Company's equity ratio (based on 1979 year-end amounts) to well under 30% of capitalization. Such an event would imply continued low bond ratings and, unless another means is provided to generate earnings sufficient to more than offset the earnings impacts, the continuation of unsatisfactory interest coverage ratios. The bankruptcy of one of the operating companies would have a domino effect throughout the GPU system, and possibly a serious impact on other PJM companies. Within the GPU system, even Penelec - which is in a much stronger financial position than the other operating companies - might be forced into bankruptcy, because it would not be able to obtain capital from the parent and because it could also be precluded from obtaining any external financing.

Neither ratepayers nor investors would benefit from precipitating the bankruptcy of any of the GPU companies. Perhaps the most disturbing facet of a financial calamity is that the companies might not be able to continue the clean-up of TMI 2. As TB&A testified in March 1980, "it appears that no one has a contingency plan to maintain the safety of TMI 2 and proceed with its clean-up in the event that Met-Ed/GPU can no longer do so." Although the NRC is apparently preparing contingency plans for taking over the clean-up operation if necessary, those plans relate to the overall management of the project, not to the staffing of the operation or liability for the costs incurred.

If GPU is not allowed to recover clean-up costs through rates and if the Federal Government does not offer financial assistance, then bankruptcy or a reorganization is probably both imminent and certain. All available information indicates that there will be additional costs under either a bankruptcy or a reorganization outside of Chapter 11.

ENERGY

It appears that the Company could have devoted more attention to power plant productivity and maintenance during the mid-1970's, but did move quickly to improve its performance in these areas in the late 1970's. As a consequence, the condition of the plants worsened during the 1977-78 period. Significant improvements in results were realized in 1979 and early 1980. The decline in plant performance is partly attributable to diverting resources to bring major new generating plants on line and to meet evolving

environmental regulations. In spite of the recent improvement in performance, there are some causes for concern. The fact that megawatt hours lost to forced outages has not significantly declined since its 18 percent increase in 1977 may indicate that equipment and maintenance problems still exist. Furthermore, the transfer of GPUSC's Generation Productivity Department personnel to work on TMI-related problems may negatively impact power plant performance in future years. Opportunities exist to improve fossil-fuel power plant performance by 3% which could provide over $13 million of annualized savings to GPU, exclusive of capital investments required.

The Company's overall performance in the fuels area has been good. It strengthened its procurement organization and procedures to correct the fuel procurement weaknesses that led to the coal overpayments by Met-Ed in the mid-1970's. Its uranium supply activities prior to TMI were appropriate. The Company, however, has not taken full advantage of its strategic opportunities in the fuels area. For example, GPU did not aggressively pursue the conversion of Met-Ed oil-fired combustion turbines to gas until January 1980. If the economic evaluations and the processes for securing regulatory approval had begun at the end of 1978, or immediately after the TMI accident when GPU began to purchase large volumes of interchange power priced on a split savings basis against its combustion turbines, the Company might have realized some benefits by the spring of 1980. GPU now estimates that it will not realize the $4 million annualized benefits from the conversions until the spring or summer of 1981.

GPU has made aggressive efforts to lower the costs of purchased power and has already achieved substantial savings of over $100 million in purchased power costs. At the same time, the Company has exercised caution where warranted such as the rejection of Pennsylvania Power & Light's offer of firm power from the Susquehanna nuclear units, and the attempt to negotiate with Ontario Hydro a pricing formula to reduce the financial risks of a potential Canadian energy export tax.

GPU's Load Management and Conservation Master Plan is comprehensive and reflects a careful, phased approach. It identifies large potential savings with a present value of $2 billion. It employs a well-balanced, time-phased approach toward implementation. The Plan, however, does not contain short-term options for achieving immediate reductions in load, and there are early indications that there may be more load reduction potential available from cogeneration than was evident at the time the Master Plan was developed. While the Plan calculates savings on a discounted cash flow basis, it does not project the program's impact on revenue requirements or such financial measures as: earnings, interest coverage, and level of short-term debt. The Plan does not explicitly consider the impact of other companies' load management efforts, or time of day profiles of future purchased power sources upon the economics of load shift programs. Finally, even though there is a high degree of uncertainty as to whether all forecast benefits of the program will be realized, no sensitivity analysis was performed to quantify the impact of this uncertainty. A major obstacle to the successful implementation of the Master Plan is GPU's current financial situation which may place serious constraints on the availability of needed manpower and investment funds.

NUCLEAR

As a result of the visibility of the accident at Three Mile Island, GPU is faced with complex institutional and political issues that could conceivably severely constrain its ability to clean up TMI 2 and restart TMI 1. Many of the restrictions being placed on GPU are far more stringent than those imposed on other utilities with operating nuclear plants. The clean-up and restart efforts will require that specific actions be taken promptly by all parties involved in order to ensure the timely and safe clean-up and restart of the units at a minimum cost.

The Company has taken numerous steps at Three Mile Island which have resulted in identifiable progress toward the safe clean up of TMI 2 and the restart of TMI 1. The concept of the nuclear organization is appropriate, but clear roles and functions need to be documented. GPU has substantially strengthened various functions at TMI through the addition of outside personnel. The selection of Bechtel as the major contractor for the clean-up of TMI 2 is reasonable and prudent. The project controls to be used by GPU and Bechtel need to be more adequately defined and implemented and a formal methods improvement program for the clean-up and restart efforts needs to be implemented. GPU public relations efforts with respect to the TMI 2 clean-up need to be strenghtened, and consideration should be given to increasing public involvement. GPU should develop and implement a specific program to communicate the adverse effects of NRC delays to its public and elicit their support to encourage the NRC to provide proper criteria for evaluation.

The issues associated with TMI are so complex that they cannot be adequately addressed in the normal regulatory process. The regulatory and political problems facing GPU will probably continue to adversely affect the ability of the Company to clean-up and restart the units in a timely and safe manner. Numerous controlling "critical paths" may affect the clean-up and restart efforts, and many of these actions may be outside the control of GPU alone. It is therefore important that GPU address these outside forces -- i.e., the NRC and various other regulatory agencies -- to assure that the clean-up and restart are accomplished in as cost effective a manner as possible consistent with public health and safety considerations.

ORGANIZATION

GPU is attempting to make significant changes in its organization and methods of operation during a very difficult period. The accident at TMI was followed by a series of events which required GPU management's time and attention above and beyond the requirements of day-to-day operations. These events included the need for crisis management at TMI, the recovery effort at TMI, numerous studies and investigations, a rapidly deteriorating financial condition, numerous rate and other public hearings, the proposed formation of GPU Nuclear Corporation, the proposed management combination of the Pennsylvania operations and a strike at Penelec. The occurrence of any one of these events might cause strain in the management of any company.

Through the holding company arrangement and membership in the PJM, GPU has attained benefits such as economies of scale in central dispatch, ability to obtain financing, load diversification, and economies of scale in generation planning and construction. However, a number of significant benefits can be achieved, both near-term and long-term, through a combination of the Pennsylvania operating companies. These benefits include: concentrated coal-fired generation expertise in the western Pennsylvania coal area; streamlined and strengthened corporate staffs; more consistent and timely response to Pennsylvania publics; more standardized methods of operation and consistent levels of service; improved career development opportunities and ability to attract and retain personnel; and a more streamlined and consistent organization structure. The Company has publicly committed itself to attain $18 million of annualized cost savings and cost avoidance through the management combination without impairing the level of service delivered by Met-Ed and Penelec.

There do not appear to be any convincing arguments against the proposed management combination. GPU management is committed to limiting the net impact of the combination on employment in the Johnstown area. Because the proposed reorganization is a management combination, not a merger, the legal entities will continue to be separate for financing and ratemaking purposes. The only significant financial implication of the proposed combination is the potential to reduce future operating costs below the level they might otherwise attain.

The original draft plan for the management combination prepared by GPU in late March 1980 did not clearly identify how the management combination would benefit Pennsylvania ratepayers. Considerable modification was required to the original proposal to address the needs and concerns of the Company's various publics. The dynamic and complex nature of corporate reorganizations necessitates an iterative approach. That is, reorganization evolves from an original proposal that is continuously refined as new facts and perspectives present themselves. This iterative process is characteristic of the proposed management combination of GPU's Pennsylvania operating companies. During the time period of this study, TB&A monitored and critiqued this iterative process. The Company's proposal now includes an improved organization plan, an objective process for selecting key personnel, detailed plans for communicating the management combination to all parties, and the identification of and commitment to the significant qualitative and quantitative benefits which would accrue to the company and the ratepayers of Pennsylvania.

SUMMARY OF STRATEGIC RECOMMENDATIONS

Exhibit II-1 provides seventeen strategic recommendations for implementation. There are also over eighty detailed recommendations which are listed in the appendix and which require action on the part of GPU, the Pennsylvania PUC or other groups. The specifics of each recommendation can be found in Chapters III through VI.

The relative priorities of the strategic recommendations are based on the perceived needs of the Company, the Commission and GPU's Pennsylvania

ratepayers. To provide a basis for selecting the appropriate level of priority, the following cr[illegible]ia were used to evaluate each recommendation:

Quantitative Benefits

- Improved performance levels
- Potential cost savings
- Potential cost avoidance

Qualitative Benefits

- Meets challanges of changing environment
- Contributes to effective management
- Improves service

For each quantitative and qualitative benefit a High, Medium, or Low classification was assigned to each recommendation. The cost benefits of the recommendations can be categorized as: improved cash flow, avoidance of operation and maintenance expenses, reduction of operation and maintenance expenses, avoidance of capital expenditures and reduction of inventory levels.

The costs required to attain the substantial and necessary benefits are difficult to quantify because they consist of a number of elements, including fees for external assistance, management time for development and implementation of new procedures, and on-going maintenance expenses. However, in each recommendation outlined in Exhibit II-1, the benefits should more than offset the implementation and maintenance costs. All of the recommendations are likely to produce indirect benefits to which specific dollar values cannot easily be attached, but which will result in more efficient and economical operations.

Three levels of priority were assigned.

A - Essential that action on the recommendation be implemented immediately.

B - Recommendation will materially contribute to performance, and specific action should be taken within three months.

C - Recommendation will materially contribute to long term performance, and specific action should be taken within one year.

With regard to potential Phase II projects, outside involvement should be considered in the implementation of each of the seventeen strategic recommendations.

SUMMARY OF STRATEGIC RECOMMENDATIONS

Page Reference	Recommendation	Quantitative	Qualitative	Priority
III-27	Establish a JOINT TASK FORCE consisting of representatives from GPU, Commissions and state governments of Pennsylvania and New Jersey, the Federal Government and the electric utility industry to address alternative courses of actions and develop and implement a comprehensive plan of action relative to critical issues facing GPU.	High	High	A
III-28	In conjunction with the Pennsylvania and New Jersey commissions, develop an INTERIM ACTION PLAN to provide GPU with financial stability pending the complete resolution of key issues by the Joint Task Force.	High	Medium	A
III-28	Prepare to implement an EMERGENCY PLAN of action to forestall bankruptcy if the due process requirements of regulation will not allow the resolution of major issues, or the implementation of an interim plan in the very near future.	Low	Low	A
IV-22	Pursue the options indentified in the 1980 TMI 2 MAJOR COMMITMENTS REVIEW OPTIONS. Continue to explore and expand upon all off-site, non-conversion alternatives to the TMI 2 restore option to provide a margin of safety should the TMI 2 restore option become infeasible.	High	High	A

Page Reference	Recommendation	Quantitative	Qualitative	Priority
IV-24	Expand and pursue the plan of action to optimize non-nuclear PLANT AVAILABILITY AND OUTPUT in order to reduce GPU's purchased power requirements.	High	Medium	B
IV-25	Accelerate development of a formal ENERGY OPTIONS STRATEGIC PLAN which includes an assessment of relevant regulatory, government policy, and fuels market factors and the initiatives that are contemplated in response to the problems and opportunities represented by these factors.	Medium	Low	C
IV-26	Further expand the LOAD MANAGEMENT, CONSERVATION AND CO-GENERATION efforts to maximize the load reduction potential.	High	High	B
IV-27	Expand and pursue the "PENNSYLVANIA SOLUTION" options, that is, initiatives sponsored by Pennsylvania regulatory authorities to develop a statewide approach to utilization of the energy reserves of Pennsylvania, including generating facilities.	High	High	A
V-16	Expedite the development of formal roles and functions of the GPU Nuclear Corporation Organization.	Low	High	B

Page Reference	Recommendation	Quantitative	Qualitative	Priority
V-17	Finalize the PROJECT CONTROLS to be used between Bechtel and GPU during the clean-up effort.	Medium	Medium	B
V-17	Develop and implement an effective METHODS IMPROVEMENT PROGRAM at TMI.	Medium	Medium	B
V-17	Continue to strengthen the PUBLIC RELATIONS efforts for GPU Nuclear Corporation.	High	High	A
V-17	Coordinate PUBLIC COMMITTEES for each nuclear facility which will be actively involved in the review of management actions.	High	High	B
V-18	Develop a specific program to communicate the adverse effects of NRC DELAYS to the Company's various publics, including the Pennsylvania and New Jersey Commissions, state legislatures and governors in order to apply pressure to the NRC to expedite its decision-making process through all available means.	High	High	A
V-21	Complete the MANAGEMENT COMBINATION of the Pennsylvania companies.	High	High	A
V-22	Take the necessary steps to complete the CONSOLIDATION OF DIVISION OPERATIONS of the Pennsylvania companies.	High	High	B
V-23	Develop a formalized organization planning process to determine the long-term needs and strategy of GPU for ORGANIZATIONAL DEVELOPMENT.	Medium	Medium	C

III - FINANCE

BACKGROUND

During the last decade the financial pressures facing the electric utility industry have intensified significantly as a result of inflation, higher interest costs, soaring fuel and construction costs and decreasing returns on equity. This section traces the effect of these changes on the industry and outlines GPU's financial position at the time of the accident. In addition, this section provides highlights of TB&A's March 1980 testimony, relating to financial issues, the major elements of the Pennsylvania PUC's rate order of May 23, 1980 and a summary of developments since those events.

ELECTRIC UTILITY INDUSTRY

There are 210 Class A & B investor-owned electric utilities in the U. S. with net utility plant of $183 billion and revenues of $65 billion serving over 67 million customers. These companies account for 78% of all electricity generated in the United States. In the years 1969 to 1978 the nation's investor owned electric utilities increased their generation of electricity by 56%. During the same period operating expenses increased almost 300%, with fuel costs accounting for almost half of the increase in costs. Higher operating expenses accounted for 85% of the increase in revenues, which in 1978 were three and one-half times the 1969 level.

In order to satisfy the increased demand for electricity, utilities invested almost $110 billion in additional plant between 1969 and 1978. Financing was provided by issuing bonds and preferred stock in the amount of $50 billion and $15 billion respectively with increases in common stockholders equity providing an additional $42 billion.

The funds obtained by the electric industry through public financings between 1969 and 1978 represent a substantial and increasing proportion of all funds obtained from public offerings. Approximately 30% of utility financing was from common stock offerings and represents an even higher proportion of total common stock offerings by all companies on the public markets.

This reflects the fact that electric utilities are capital intensive; in order to generate a dollar of revenue, utilities must invest three dollars in utility plant. This compares with $.70 in assets per dollar of revenue for the 1,000 largest industrial corporations in the U. S. Slightly over 10% of the Fortune 1,000 require more than one dollar of assets to generate a dollar of revenue, and only a handful of those require more than $1.25 in assets per revenue dollar. The electric utility industy is far more highly leveraged than would be considered prudent for an industrial concern. Electric utilities have a debt to equity ratio of 1.7 to 1 whereas for industrials a debt/equity ratio of 1 to 1 or greater would be considered imprudent.

GENERAL PUBLIC UTILITIES

At the end of 1979, GPU had net utility plant of $4.2 billion and revenues of $1.5 billion. The Corporation's capital structure was as follows:

Item	12/31/79 Amount (Billions)	Capital Ratio(a) (1)	(2)
Long-term debt	$ 2.2	53.7%	51.2%
Preferred stock	0.5	12.2	11.6
Common equity	1.4	34.1	32.5
Subtotal	$ 4.1	100.0%	95.3%
Notes Payable	0.2		4.7
Total	$ 4.3		100.0%

(a) The amounts shown in column (1) are those traditionally taken into consideration for rate-making purposes. The amounts in column (2) include short-term debt. Rating agencies now attach greater importance to the use of short-term debt because it is a key indicator of a company's financial flexibility. When a company's short term obligations reach 5% of capitalization, it is assumed that the amount is part of capitalization since, it is considered, it should at that level be funded out by long-term obligations.

Prior to the accident at TMI 2, GPU was in a sound financial position with a bright outlook for the future. The initiation of commercial service at TMI 2 in December 1978 marked the completion of a major construction program which would provide the Company and its customers with an abundant source of low cost energy. While it still faced major construction requirements in Pennsylvania and even more so in New Jersey, the Company had reached a plateau which put it in an enviable position relative to the rest of the electric utility industry, and to northeastern utilities in particular. It had a low-cost generation mix due to its higher than average of nuclear capacity. Even using 1978 data (see Exhibits III-1 and III-2), which do not reflect the contribution that TMI 2 would have made, GPU's production costs from internal generation were almost 7% lower than the national average and more than 15% lower than the average for other Pennsylvania companies. The addition of TMI 2 would have further strengthened the Company's position.

The Company's financial position was sound and improving and it was under consideration for an upgrading of its credit rating. In line with its conservative financial policies, GPU had not entered into many of the unconventional financing practices now common in the industry. The fact that GPU had not already financed its nuclear fuels and had recently reduced its short-term lines of credit proved to be most helpful when it sought the

COMPARISON OF POWER PRODUCTION COSTS FOR GPU AND OTHER ELECTRIC UTILITIES 1978

	All Class A & B Utilities		Northeastern Companies[d]		GPU	
Source	Average Cost Per MWH	Source as Percent of Net Generation	Average Cost Per MWH	Source as Percent of Net Generation	Average Cost Per MWH	Source as Percent of Net Generation
Steam Conventional[a]	$17.47	80.3%	$22.77	73.0%	$17.87	62.8%
Steam Nuclear	6.71	13.5	8.48	22.7	5.69	33.4
Hydro	1.97	4.8	3.05	3.1	5.65	0.8
Other[b]	35.80	1.4	58.05	1.2	44.28	3.0
Total[c]	$15.54	100.0%	$19.36	100.0%	$14.49	100.0%

(a) Includes both coal and oil-fired generation.

(b) Predominantly gas turbines.

(c) Excludes pumped storage.

(d) See Exhibit III-3. Excludes GPU companies.

Source: Statistics of Privately Owned Electric Utilities in the United States - 1978 Department of Energy, October 1979; and Uniform Statistical Reports - 1978

EXHIBIT III-1

COMPARISON OF POWER PRODUCTION COSTS
FOR MET-ED, PENELEC AND OTHER PENNSYLVANIA UTILITIES
1978

Source	Met-Ed		Penelec		Other Pennsylvania Utilities[d]	
	Average Cost Per MWH	Source as Percent of Net Generation	Average Cost Per MWH	Source as Percent of Net Generation	Average Cost Per MWH	Source as Percent of Net Generation
Steam Conventional[a]	$17.96	58.4%	$16.19	85.1%	$18.15	84.0%
Steam Nuclear	4.38	37.8	4.38	12.8	9.10	11.9
Hydro	5.06	1.6	6.34	0.9	3.18	2.4
Other[b]	48.58	2.2	39.82	1.2	44.81	1.7
Total[c]	$13.31	100.0%	$14.86	100.0%	$17.19	100.0%

(a) Includes both coal and oil-fired generation.

(b) Predominantly gas turbines.

(c) Excludes pumped storage.

(d) Duquesne Light, Pennsylvania Power, Pennsylvania Power & Light, Philadelphia Electric and West Penn Power

Source: Uniform Statistical Reports - 1978

EXHIBIT III-2

Revolving Credit Agreement immediately following the TMI accident. In fact, as indicated in TB&A's March 1980 testimony, several members of the financial community were of the opinion that negotiating the Revolving Credit Agreement plus two private placements represented "a remarkable achievement, and one which few managements in the industry would have been equal to." Additionally, several of those interviewed told us that they could think of a number of companies in the utility industry that would not have survived an occurrence such as the accident at TMI 2.

HIGHLIGHTS OF TB&A MARCH 1980 TESTIMONY

The major findings in TBA's testimony related to financial issues were as follows:

- The $55 million rate request for Met-Ed represented the company's minimum requirement. (The PUC's May 23rd Order granted the full amount requested, plus rapid recovery of deferred energy costs.)

- The Company would require additional rate relief in the near future. (Met-Ed and Penelec filed rate requests for an additional $75 million and $65 million per year, respectively, during July 1980.)

- Even with the escalation in its costs since the accident, it does not appear likely that Met-Ed's rates will become the highest in the Northeast. (See Exhibit III-3.)

- Without the ability to obtain external financing it will be difficult for GPU to undertake a major spending program such as the clean-up of TMI 2.

- The Company's $400 million estimate of the clean-up costs was a "soft" number. The actual costs will most likely be much higher. (In August of 1980 GPU released a revised estimate of clean-up and restoration costs of $855 million.)

- The greatest cost of the accident is the cost of replacement power and those costs ($127 million and $325 million per year for Met-Ed and GPU, respectively) were subject to potentially significant change due to circumstances outside the Company's control. (While the Company's cost of replacement power has not increased, this is in large measure due to GPU's success in obtaining purchased power from coal-based utilities outside PJM. This has reduced the sensitivity of GPU's replacement power costs to escalation in oil prices.)

- If GPU is to obtain external financing, it must obtain a level of revenues that will convince its creditors that it can recover their costs.

- The Company's cash flow position has deteriorated to the point where it might not be able to deal with another major unforeseen event.

RESIDENTIAL CUSTOMER REVENUES
FOR NORTHEASTERN UTILITIES
1979

Utility	Average Number of Residental Customers	Revenue per MWH
Con Edison	2,367,589	$ 105.19
Long Island Lighting	806,262	71.62
PSE&G	1,486,142	70.08
Boston Edison	486,368	63.88
Duquesne	493,509	62.30
Jersey Central Power & Light	617,515	60.50(a)
New England Electric System	935,915	60.21
Central Hudson Gas & Electric	181,631	60.10
Delmarva Power & Light	240,401	58.62
Philadelphia Electric	1,171,340	57.86
Penelec	447,063	52.64(a)
Northeast Utilties	957,417	52.02
New York State Electric & Gas	586,665	49.78
Metropolitan Edison	314,219	49.14(a)
Rochester Gas & Electric	253,069	45.69
Niagara Mohawk	1,206,469	43.27
Potomac Electric	215,090	41.26
Average for 210 Class A&B Electric Utilities	59,311,000	43.10(b)

Source: Uniform Statistical Reports for 1979 and Statistics of Privately Owned Electric Utilities in the United States - 1978

(a) For the 12 months ended June 30, 1980 the average revenues per megawatthour (MWH) for residential customers were $55.20, $54.60 and $68.90 for Met-Ed, Penelec and JCP&L, respectively. These amounts more fully reflect the impact of rate decisions since the accident. However, information was not available to compute recent comparable figures for the other companies.

(b) 1978 average.

- The loss of its ability to obtain external financing will have a severe negative impact on the Company's ability to maintain service to customers and expedite the clean-up of TMI 2.

- The uncertainties associated with bankruptcy pose risks to ratepayers, regulators and investors. These risks, which cannot be completely quantified, should be avoided.

- Customers of all utilities dependent on the PJM power pool could be impacted due to the lack of planning by the PJM for a bankruptcy of a member company.

- Efforts to clean up TMI 2 might be slowed due to uncertainty with respect to responsibility for the clean-up thereby potentially endangering the public health and safety.

- No evidence was found to indicate that ratepayers would benefit financially from bankruptcy; the existence of a new untested bankruptcy law leaves too many questions with respect to the eventual outcome of such a proceeding.

- The cost of outside capital is not of as much concern to the GPU companies as the availability of such capital.

- The question of the Met-Ed franchise should either be deferred until all available options are studied or resolved in favor of the status quo. (The franchise issue was dismissed by the PUC in its May 23rd order.)

- The banks in the Revolving Credit Agreement attached symbolic and strategic importance to maintaining TMI 1 in the rate base. (The PUC removed TMI 1 from the rate base in its May 23rd Order.)

- The banks in the Revolving Credit Agreement will be reluctant to advance funds without assurance as to the source of funds to repay the loans. (In September 1980, subsequent to the denial of emergency rate relief by the PUC, the banks in the Revolving Credit Agreement linked the amount of credit available to Met Ed to its rapidly declining deferred energy balance. The progressive reductions in credit caused by this action will be partly offset by the pledge of Met Ed's accounts receivable, as approved by the PUC on September 18, 1980. The receivables will provide security for $20 million of borrowings under the RCA.)

- The "material adverse change" clause allows the banking group to withdraw from the Revolving Credit Agreement.

ACTIONS BY THE PENNSYLVANIA PUC

The PUC's rate order of May 23, 1980 was a major milestone in the resolution of GPU's financial crisis. The Commission removed one of the greatest uncertainties facing the Company by dismissing the order to show cause on the revocation of Met-Ed's certificate of public convenience:

> "We must conclude that based upon this record no modification or revocation of Met-Ed's certificate is required at this time because we find no imminent and foreseeable threat to continued provision of adequate and reliable service at reasonable rates."

More importantly, the Commission enunciated its position on Met-Ed's role in providing electric service in its franchise territory and on the support that could be anticipated from the PUC:

> "The basic conclusion of the Commission in this order is that Met-Ed should continue to operate as a public utility. The Commission will provide Met-Ed the means of financial rehabilitation."

In addition, the order provided for approximately current recovery of energy costs and a rapid recoupment of deferred energy costs to provide increased cash flow. This ensured the company's viability in the short term and provided time to study the longer-term issues. Other major elements of the May 23rd order related to TMI 1 rate base treatment, clean-up costs and the role of the Federal Government.

The removal of TMI 1 from the rate base, a decision viewed by the Commission as subject to review when warranted by a change in circumstances, was based on the finding that the uncertainties surrounding the restart were so great as to cause it to fail the test of "imminence and certainty" of returning to service to the public.

In the May 23rd order the Commission stated, without expansion, that "nothing negated" the position it took in its order of June 19, 1979 regarding clean-up costs:

> "The Commission is of the view that none of the costs of responding to the incident, including repair, disposal of wastes and decontamination are recoverable from ratepayers. These costs are and should be insurable."

The PUC decried the Federal Government's lack of financial assistance on the grounds that Federal intervention was implicit in the enactment and extension of the Price-Anderson Act. In 1957 the Joint Committee on Atomic Energy commented that:

> "The chance that a reactor will run away is too small and the foreseeable possible damages of the reactor are too great to allow the

accumulation of a fund which would be adequate. If this unlikely event were to occur, the contributions of the companies protected are likely to be too small by far to protect the public, so Federal action is going to be required anyway."(1)

And in 1975 the statute itself included the following provision:

> "Provided, that in the event of a nuclear incident involving damages in excess of the amount of aggregate liability, the Congress will thoroughly review the particular incident and will take whatever action is deemed necessary and appropriate to protect the public from the consequences of a disaster of such magnitude."(2)

Based on these findings, the Federal Government was called on to recognize its responsibilities and honor its commitment to GPU and its ratepayers.

SUBSEQUENT DEVELOPMENTS

Subsequent to TB&A's March 1980 testimony and the Commission's final rate order of May 23, 1980, this study focused on those underlying issues affecting the long-term viability of the companies. It is now apparent that the optimal resolution of the major issues cannot be achieved within a narrow framework. The interests of the ratepayers of both Pennsylvania operating companies are inextricably intertwined with those of GPU's New Jersey ratepayers and also with the fortunes of the Company's investors. Furthermore, the Nuclear Regulatory Commission, Congress and the Department of Energy are major players in the resolution of the financial issues. The NRC is a key - if silent - player with regard to financial issues. The action or inaction of this agency will, to a much greater extent than initially perceived, influence the outcome of major financial issues.

Congress and the Department of Energy have emerged as parties in interest. The value of oil required to produce the same amount of electricity that could be provided by TMI 1 and 2 is $235 million and $270 million per year, respectively. In 1980, the United States will pay almost $100 billion to OPEC. This is nearly ten times what it was five years ago and equal to 10% of the value of all stocks listed on the New York Stock Exchange. The implications are as ominous as they are obvious. It is not overly dramatic to relate the GPU predicament to national energy policy or to underscore the profound change that has affected one of the major underpinnings of our economic strength: a stable supply of cheap energy. This

(1) S. Rep. No. 296, 85th Cong., 1st Sess. reprinted in [1957] U.S. Code Cong. & Ad. News 1810-11.

(2) 42 U.S.C. 2210(e)(Supp. 1979).

concern is magnified by the growing awareness that we must revitalize our industrial base -- and a major obstacle to any reindustrialization program will be the poor financial condition of the electric utility industry.

The treatment accorded GPU and the precedents set in resolving the problems brought on by the accident will have significant implications for the future of nuclear energy, the nation's fuel consumption patterns and the cost of energy. The electric utility industry will be given clear signals on how to proceed -- be it through legislative fiat, the imposition of regulatory criteria that cause the construction cost of nuclear stations to become prohibitively expensive, or an increase in the cost or lack of availability of capital for nuclear projects due to investor perceptions of increased risks.

While the average costs of constructing coal vs. nuclear generation have historically been close, it is also apparent that the economics vary significantly by region. The Northeast and Atlantic seaboard favor nuclear and the West favors coal-fired generation. However, a de jure or de facto moratorium on nuclear construction may lead to a sub-optimal fulfillment of future energy needs. The same result could be brought about by the inclusion of a risk premium in the cost of capital for nuclear generation which might lead utilities to shift toward more fuel intensive capacity in an effort to keep total costs and risks as low as possible.

In addition to national economic considerations, there are also unresolved questions regarding the more specific responsibilities of the Federal Government to GPU in the wake of the accident. The form and structure of Federal involvement as well as the types and extent of costs to be covered, if any, will require clarification. A study recently completed by the General Accounting Office on behalf of the Senate Committee on Environment and Public Works has called for the Department of Energy to undertake a more detailed study.

KEY ISSUE ANALYSIS

The five key financial issues facing GPU are:

- Clean-up and restoration costs
- TMI 1
- TMI 2
- Forked River
- Deferred energy

Other factors must also be considered:

- Loss contingencies
- Tax losses
- Potential impact of clean-up costs on revenues
- Access to capital markets
- Bankruptcy
- Reorganization
- Restoring financial viability

The manner in which these issues are resolved will determine the fate of the GPU System. The unfavorable resolution of any one of these issues - all of which have a potential major impact on earnings and capital - could trigger bankruptcy. The amounts involved, excluding any tax effect, and indicators of their relative magnitude are shown in the table which follows.

Order of Magnitude of Key Issues

Item	Amount (Millions)	Item As A Percent Of: Net Utility Plant	Equity Capital
Clean-up and restoration costs(1) (net of insurance)	$ 555	13%	40%
TMI 1	380	9	27
TMI 2	715	17	51
Forked River	390	9	28
Deferred Energy	238	6	17

(1) Current Company Estimate

These issues are critical and require resolution, or at least substantial clarification, in the near term because of their potential not only to destroy the Company's equity base, but also to so impair earnings that the Company would be precluded from the financial markets. This latter event could also bankrupt GPU.

The amounts involved are so large that any one of them could have a major unfavorable impact on the Company. In fact, the uncertainty that currently surrounds the possible outcomes is by itself contributing to the financial instability of the Company.

CLEAN-UP AND RESTORATION COSTS

Clean-up and restoration costs were orginally estimated by Bechtel to approximate $400 million, of which $300 million would be covered by the company's insurance, and $100 million would be funded from other sources.

At present there are two questions related to clean-up and restoration costs:

- How much will the costs really be, and

- How will the uninsured portion be funded?

As indicated in TB&A's March 1980 testimony, "the $400 million estimate was a 'soft' number and would likely be much higher." In regard to the first question, GPU's most recent estimate of clean-up and restoration costs was $855 million, and a recent GAO study estimated the costs at $900 million. These estimates do not reflect insurance recoveries.

No estimate can yet be considered firm because of the many uncertainties remaining. In fact, an analysis of the Company's most recent estimate indicates that the ultimate net cost of the clean-up could easily be higher by several hundred million dollars simply as the result of inflation.

Analysis of Clean-up and Restoration Costs

Item	Estimated Cost (Millions)
Current estimate of costs to complete clean-up, 1980 forward	$503
Clean-up costs incurred in 1979	95
Cost of damaged core	37
Unrecovered operations and maintenance costs during outage	90
Total clean-up costs	$725
Less: Insurance	300
Net Clean-up cost	$425
Plus: Reconstruction and restoration and replacement core	257
Clean up and restoration cost - 1980 dollars	$682
Estimated impact of inflation (10% annualized)	252
Total	$934

If all costs attributable to the outage of TMI 2 clean-up are included, and if inflation is factored in, the ultimate net cost of the clean-up and restoration could well approach $1 billion. In addition, the existing estimates do not reflect the costs of any, as yet unknown, additional NRC requirements or further regulatory or other delays affecting the pace of the clean-up efforts.

With regard to the second critical question on funding clean-up costs the Pennsylvania PUC has stated:

> "The Commission is of the view that none of the costs of responding to the incident, including repair, disposal of wastes and decontamination are recoverable from ratepayers. These costs are and should be insurable."

This statement was made without benefit of more recent estimates, nor were those estimates available when the Commission referred to this statement in the May 23rd order. When the accident occurred, GPU's insurance coverage was the maximum available at the time.

When the uninsured portion was estimated at $100 million and the Company was still generating earnings and still had adequate interest coverage, the Commission's statement may have caused concern among the Company's lenders and potential lenders, but the amount was not so large for a major utility that the funding question had to be resolved immediately, particularly in view of the other, more urgent, questions before the Commission.

The tenfold increase in the uninsured cost has changed this situation radically. Although the insurance proceeds will cover the bulk of the clean-up costs through 1981, the uninsured costs are now so great that a continuation of the uncertainty surrounding the source of funding could well preclude any external financing even if the Company's earnings and coverage were restored to acceptable levels. In fact, if this issue is not resolved promptly, the Company's existing borrowing arrangements could be jeopardized.

In its order of September 18, 1980 the PUC denied emergency rate relief to Met-Ed. The PUC again reaffirmed its opposition to collecting clean-up costs from ratepayers and further stated that

> "clean-up costs and expenditures not covered by insurance ultimately are the responsibility of the Company's stockholders and/or the Federal Government; however, they are not the responsibility of ratepayers."

After noting that a portion of the deferred energy costs collected from Met-Ed customers are funding some of the uninsured clean-up costs, the PUC ordered the Company to "cease and desist from using any operating revenues for uninsured clean-up and restoration costs."

TMI 1

The combined investment in TMI 1 is $380 million. The base revenues and earnings associated with this asset are $57 million and $28 million, respectively. The ultimate question is whether or not it will be allowed back in the rate base, and, if so, when. The position taken by the PUC has in turn linked these questions to the NRC's decisions on granting a license to restart. The proceedings concerning the restart involve lengthy public

hearings and have already suffered significant delays. In addition, the Atomic Safety and Licensing Board has recommended that the NRC establish "psychological stress" as one of the criteria for determining whether the reactor should be allowed to restart. This opens the possibility that, even if there are insufficient technical, engineering or safety reasons for delaying or refusing the restart, the plant might still not be licensed. These factors have greatly increased the uncertainty surrounding the likely outcome of this issue.

In addition, the NRC must be assured of the financial integrity of GPU to operate nuclear stations. But with both TMI 1 and TMI 2 out of the rate base, the Company's financial position is continually deteriorating. In June 1980 GPU showed a consolidated loss. With its existing rate orders, the Corporation will probably have very low earnings and may well incur a loss for the full year. Because of these unfavorable trends and the Company's inability to obtain external funds, the NRC may be hard-pressed to allow restart if the financial condition of the companies is allowed to worsen.

TMI 2

The combined investment of the GPU System companies in TMI 2 is $715 million, or more than half of the Corporation's equity base. Shortly after the accident, the investment in TMI 2 was excluded from the rate base for each of the operating companies. As a result, base revenues and earnings were reduced by the following amounts:

Reductions In Base Revenues and Earnings
(Millions Per Year)

	Met-Ed	Penelec	GPU (Includes JCP&L)
Revenues	$52(a)	$27(b)	$108
Earnings	$26	$14	$ 56

(a) TMI 2 component of base rate increase approved in March 1979, but not implemented due to accident.

(b) Base rates reduced by $25 million; deferred energy cost amortization increased by $2 million.

Neverthless the Company must continue to pay the fixed costs associated with the plant. The major fixed-cost elements are as follows:

Major Fixed Costs of TMI 2
(Millions Per Year)

	Met-Ed	Penelec	GPU (Including JCP&L)
O&M and Depreciation	$ 17	$ 8	$ 34
Debt	14	7	27
Preferred Dividends	3	2	6
Total	$ 34	$ 17	$ 67

With respect to TMI 2, the most important question is when - if ever - it will return to service. At present, and perhaps for several years into the future, this question cannot be answered. However, the question that can be answered - and in all probability cannot be postponed for years - is who will pay for it, particularly if it is not allowed to return to service.

Even if all the other issues are favorably resolved, the continuing prospect of writing off a substantial part or all of the TMI 2 investment against equity capital could in and of itself impede external financing. As with TMI 1, the fact that TMI 2 is excluded from the rate base without allowance for any element of cost is an indication that such a possibility is very real. In fact, a write-off against equity is exactly what is accomplished by exclusion from the rate base, albeit over a much longer period of time.

The longer the unit remains out of the rate base, the greater will be the pressure on the Company to make provision in its accounts for an estimate of the full loss. While the accounting profession defers to regulators in applying accounting principles to utilities, it may be expecting too much to assume that an asset of such magnitude will be allowed to be written off - with no recovery - over 30 years. And if the accountants delay in requiring recognition of the loss, analysts and potential lenders will most likely assume it has happened and adjust their projections accordingly.

Due to the prolonged period of the outage, the regulatory treatment afforded thus far, and uncertainty as to whether it will return to service, the recoverability of the investment is in doubt. If these circumstances continue and if the PUC does not allow the Company to recover these costs or if it becomes clear that the costs of the unit will be borne by investors until the unit returns to commercial operation, then it is reasonable to expect pressure on GPU to recognize the loss of value during the expected period of the outage. Assuming the earliest restart (return to commercial service) at July 1, 1987, the Corporation could be required to write down its investment in TMI 2 to recognize the impairment in value of the asset. Currently GPU is charging off over $80 million per year - excluding equity return - in unrecovered costs associated with TMI 2. The longer that the recovery of TMI 2 costs remains unresolved, the more compelling will be the pressure to recognize the impairment of value by a writedown against equity.

FORKED RIVER

Although it is owned entirely by JCP&L, Forked River has a potential impact on the Pennsylvania operating companies and their ratepayers and reflects the broader issues facing the GPU System. JCP&L now has $390 million (including $30 million previously allowed in the rate base) invested in its Forked River project. The project, initiated in 1969, was planned as a nuclear generating station. Prior to the accident it was expected to be completed in December 1983, providing capacity of 1168 MW. The most recent cost estimate prior to the accident was $1.2 billion.

Following the accident, GPU slashed its construction program to conserve cash - principally by deferring or cancelling expenditures for Forked River. The reductions in spending for Forked River represent 47% and 64% of the total construction cut-backs for 1979 and 1980 respectively. The project, on which less than 30% of the costs had been incurred, has been suspended indefinitely and the Company ceased accruing AFUDC (allowance for funds used during construction) in April 1980. Therefore, the approximately $35 million of carrying costs on this investment will have to be recognized out of current revenues.

If work on Forked River is not resumed in the reasonably near future, its status as a non-earning and non-productive asset must be resolved. The key question here, as with the other major issues, is the impact on earnings and equity. If, at one extreme, the investment must be written off, the result would be to reduce JCP&L's common equity by 60% (based on 1979 data). This represents an almost 30% reduction in GPU's consolidated common equity. The effect would reduce JCP&L's equity ratio from 37% to 19%. Since the only source of equity capital for the operating companies is the parent company, GPU Corporation -- which cannot obtain external financing -- JCP&L would be left with an equity base insufficient to support debt financing. The result would be that JCP&L would be pushed into a financial crisis--a crisis that would probably affect the rest of the GPU system.

Alternatively, the costs might be amortized through rates. This practice, which has been applied in the past to other utility company investment programs that have been cancelled, would probably allow recapture of cost without any earnings (i.e., with the unamortized investment excluded from rate base). One of the questions regarding this approach is the amount of investment the company would be allowed to recover. It is possible for example that some portion of the AFUDC increment ($35 million) might be disallowed since this represents prior earnings on the project costs incurred as of the date the investment qualified as a dead asset.

To the extent that Jersey Central's investment in Forked River is not a recoverable asset, the Corporation's earnings and equity capital will be impacted. On a statewide basis, both Pennsylvania and New Jersey have approximately equal distributions of consolidated equity capital. Consequently, an impairment in one state could have an unfavorable effect on the other.

DEFERRED ENERGY

The current deferred energy balance is approximately $238 million for the GPU system and represents the smallest dollar amount of the major issues. Although the rate action in the PUC's May 23rd order provides for rapid amortization of the balances, the issue has a significant relationship

with the Company's short-term borrowings. The recent deferred energy and short-term debt balances for the companies are as follows:

Deferred Energy Costs
(000's)

	12/31/78	12/31/79	6/30/80	Estimated 12/31/80
Met-Ed	$ 23,221	$ 82,499	$ 85,640	$ 51,000
Penelec	23,312	12,985	16,839	11,000
JCP&L	56,405	77,286	135,808	105,000
Total GPU	$102,938	$172,770	$238,287	$167,000

Short Term Debt
(000's)

	12/31/78	12/31/79	6/30/80	Estimated 12/31/80
Met-Ed	$ 35,000	$ 68,000	$ 94,000(a)	$ 91,000(a)
Penelec	500	-	-	-
JCP&L	54,100	45,000	133,000	120,000
GPU Corp.	-	58,000	47,000	43,000
Total GPU	$ 90,100	$171,000	$274,000	$254,000

(a) Includes $13 million of first mortgage bonds issued and outstanding with the Revolving Credit Banks.

Based on the rapid recovery of deferred energy allowed the companies, the unrecovered costs incurred since the accident will be substantially reduced by the end of 1980 and almost eliminated by the end of 1981. There are two concerns with respect to this issue:

- When the deferred energy balances are exhausted, the Company's cash flow will drop significantly unless other sources are provided; and

- Based on current projections, the level of short-term debt does not appear to be decreasing in tandem with reductions in the deferred energy balances for all the companies.

The Pennsylvania Commission's May 23rd order provided for Met-Ed and Penelec to recover their deferred energy costs over 18 months. While Penelec has only a small balance and an otherwise satisfactory cash flow, the accelerated recovery is critical to Met-Ed. When the 18 month amortization period ends, because of Met-Ed's current tax loss position, cash flow will drop by the full revenue reduction of $56 million per year based on the level of annual sales assumed in the Commission's May order.

While these revenues do not reflect earnings, they provide vital cash flow, that is, approximately 12% of Met-Ed's current collections from customers. Although the rapid recoupment of the unrecovered energy costs is a significant benefit to Met-Ed, it is only temporary relief.

The more immediate concern about the deferred energy balance relates to Met-Ed. Based on the experience since implementing the Commission's May 23rd order it appears that Met-Ed's short-term debt is not being reduced at the same rate as its deferred energy balance. This is particularly disconcerting to the banks participating in the Company's Revolving Credit Areement. As the bankers view the situation, the proceeds of their loans were to finance the rapid growth in the deferred energy balance. During the period following the accident, the two balances moved up in tandem. It now appears that for Met-Ed, at least, the reverse may not be true. Although the deferred energy balance for Met-Ed will decline by $35 million between June 30 and year end, the Company projects that Met-Ed's short-term debt will be reduced by only $4 million.

The major elements causing this imbalance, excluding current operating and maintenance expenses, are construction costs which include expenditures for the distribution system (new customers) and modifications to TMI 1, contract retention payments to DOE for prior fuel enrichment services, and mandatory sinking fund payments and refinancings. Since, GPU's quarterly insurance recoveries approximate two-thirds of the amounts spent on the clean-up, Met-Ed has also funded its share of the unrecovered costs.

The bankers' concern is heightened in light of the prior question regarding the unrecovered energy costs -- within a short time the deferred energy balance will be exhausted and the Company may find it even more difficult to repay the loans, particularly if access to capital markets remains blocked. In early September 1980, the banking group imposed new repayment terms. The banks have linked the amount of credit available to Met-Ed to the unrecovered balance of energy costs. As a result, the credit available to the Company will be steadily reduced. If Met-Ed and its parent company continue to be unable to access capital markets, the reduction in credit available to Met Ed could lead to a cash flow crisis far more severe than experienced to date. In fact, the projected cash flow for Met-Ed indicates the need for an increase in its existing borrowing limit to fund a $26 million gross receipts tax payment to the State of Pennsylvania in April 1981. The state cannot allow deferral of this payment without action by the State Legislature. However, non-payment of the tax would be an event of default under various of the Company indentures.

LOSS CONTINGENCIES

The most current estimate of clean-up and restoration cost represents approximately 40 percent of GPU's equity capital; the underlying investment in TMI 2 represents half the equity base. If TMI 2 is not cleaned up, restored and returned to service, the Company's ability to recover its original investment would be in doubt. If GPU and its investors are to be the sole source of funding for clean-up and restoration costs, the Company may be required to make provision for significant loss contingencies in its financial statements well before the costs are incurred.

Accounting principles require that a company provide for a loss if it is probable that an asset is impaired or that a liability exists and if the amount of the loss can be reasonably estimated. Accounting principles are applied differently to regulated industries "because of the effect in regulated businesses of the rate-making process, a phenomenon not present in non-regulated businesses."(1) A regulated company can postpone writing-off expenses or writing-down assets "if it is clear that the cost will be recoverable out of future revenues."(1) In the case of GPU, the issue of whether its costs or asset values will be fully recoverable can be determined only through a formal rate proceeding before the PUC. The accounting rules, however, do not specify a time limit within which these issues must be settled. On the other hand, once it is judged that there is considerable doubt about the recoverability of costs or asset values "because of economic conditions, or for other reasons",(1) then even a regulated company must recognize the loss.

The recoverability of the Company's investments in assets that are not currently earning a return could well hinge on the PUC's determination regarding clean-up costs. A sequence of events such as the following probably must take place before the financial reporting issues can be settled:

- GPU must request a rate-making determination on clean-up costs. Until the Company files a formal request through a rate application, the PUC cannot make a determination. In the absence of a determination, favorable or otherwise, the PUC's prior comments on clean-up costs cannot be construed to reflect its ultimate intent.

- The PUC must make a rate-making determination on clean-up costs. Once GPU petitions the PUC for rate-making treatment (either revenue relief to cover the clean-up costs or earnings sufficient to finance the costs over a long period of time, coupled with regulatory assurance that adequate funds will be provided to allow the Company to repay the loans), the Commission must make a judgment on the facts presented and issue a rate order.

  If the rate order provides funding for clean-up costs, this issue will be settled. If, on the other hand, the rate order is unfavorable, the Company will probably have to take the issue to the courts. If the courts issue a stay order, the issue will be suspended pending a final decision. If the final decision supports the authority of the PUC, GPU might be able to appeal to the Federal Government for emergency assistance. If Federal assistance were forthcoming in the form of grants or direct loans, the crisis might pass, although the other major issues would still have to be resolved. However, if no Federal funds were granted, or if Federal assistance were coupled with the assumption of ownership of TMI 2 (and possibly TMI 1) in return for assuming liability for the clean-up, the satisfactory resolution to funding the clean-up costs would create other problems to be addressed.

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(1) Addendum, Opinion No. 2, Accounting Principles Board

Under one of the possible "unfavorable" scenarios (no funding from any source, or funding coupled with loss of ownership to the Federal Government), the Company would have no immediate prospect for completing the clean-up and returning the plants to service or it would lose ownership in the asset(s). If one of these eventualities came about, the Company's only remaining option would be to petition the PUC for recovery of the investment value on assets that would have little or no likelihood of returning to service. If the Company's request were refused, then (and perhaps only then) would the Company be required to account for the loss contingency by a write down of asset values.

While this sequence of events may appear to be a somewhat contrived road to bankruptcy, it should be noted that:

- The Company has not yet requested rate-making treatment of clean-up costs. The next opportunity to file for rate-making treatment will be after the conclusion of its current rate case, in March or April of 1981.

- Based on the revised Bechtel clean-up schedule, the insurance proceeds will be depleted by the end of 1981.

- The PUC has gone on record several times opposing the recovery of clean-up costs from ratepayers.

- The White House has indicated that it has no statutory authority to provide direct financial assistance.

- No other source has yet been identified to fund the clean-up costs.

In the meantime, other events may overtake the Company and its regulators. First, each operating company must issue - with the concurrence of its external auditors - a statement on retained earnings to its Board of Directors before declaring quarterly preferred dividends. This statement requires that the operating company's retained earnings are not impaired by any loss contingencies. If this certification cannot be provided, and if preferred dividends are omitted, the preferred stockholders would gain a direct voice in the management of the individual operating companies following the third consecutive dividend omission. In addition, the Company's bankers could invoke the "material adverse change" clause soon after an unfavorable decision by the PUC. And even if the banking group stayed such action for a while, it is unlikely that they would await a final determination on how the contingency would be treated in the financial statements.

If a loss contingency were to be provided for, the Company's equity ratio could drop from approximately 33% to well under 30%. The SEC, through the Public Utility Holding Company Act, requires that GPU maintain a minimum 30% equity ratio. Violating this standard would undoubtedly have grave consequences. At its current market price, GPU would have to more than double the number of shares outstanding to restore the equity base. Such a consideration may be moot in the face of possible stockholder suits and a

market unwilling to digest a speculative issue of such magnitude, even if the requisite approvals could be obtained from the SEC.

TAX LOSSES

If any of the operating companies are required to write-off significant assets, corresponding tax losses will be created. In terms of net income this represents a potential benefit since tax losses can be utilized to shelter income. In theory, then, if GPU were to write-off assets or expense unrecovered costs, the net cost to the company would be the loss offset by the tax effect.

A review of the Company's present tax position indicates that there is very limited benefit to be gained from substantial tax losses unless taxable income is very high during the seven carryforward years allowed by the tax code. If the tax loss were created by the write-off of rate-base assets, the return on equity required to provide a level of income high enough to utilize significant tax losses could be extraordinarily high.

ACCESS TO CAPITAL MARKETS

Prior to the accident, GPU's investment program called for spending more than $8.5 billion during the 1980's. While this level of spending is not unusual for an electric utility, it reflects the Company's need for capital. Without the ability to issue bonds and new equity, the capital spending required to expand the transmission and distribution system, expand generation capacity and reinforce and improve system reliability to meet future demand will have to be severely curtailed or cancelled. Even if the Company is successful in its plans to reduce the level of future demand, its capital spending requirements will remain substantial. Following the accident, GPU reduced its spending programs to minimum levels. Although minimum spending levels can be tolerated for a short while, the lead time required to plan and complete many construction programs requires a healthy capital investment program. There will undoubtedly be an unfavorable impact on the level and quality of service in the future if such an investment program is not resumed within the next several years.

In order to satisfy these capital needs - without addressing any additional needs for the clean-up of TMI 2 - GPU will have to regain its ability to access capital markets. For this to happen, several events must take place. First, the major uncertainties now facing the Company must be resolved. Once the major issues are resolved, GPU must achieve acceptable earnings and regain respectable coverage ratios. These two events will enable the Company to access bond markets and issue preferred stock. At this point, the Company should have reached a plateau which will enable it to satisfy its capital requirements for a short to intermediate period of time. However, at some point GPU will also have to issue new common stock to replenish its equity base. While the industry has demonstrated that it is possible to market new equity at less than book value, GPU's ability to issue new stock at a deep discount from book values is somewhat problematic. Regaining earnings will help, but since utility common stocks compete with bonds, the resumption of dividend payments on common stock must take place well before attempting to market new shares.

POTENTIAL IMPACT OF CLEAN-UP AND RESTORATION COSTS ON REVENUES

Exhibit III-4 illustrates the impact of funding clean-up and restoration costs through rates on Met-Ed's revenue requirements. If TMI 1 returns to service, and if the full amount of the Company's current rate request is included, the level of revenues -- after deferred energy costs are collected -- will be less than 10% above current levels. This is based on full payment of clean-up and restoration costs over five years based on an estimate that reflects an allowance for inflation. Alternatively, if the costs were to be financed and amortized over 20 years, the net increase could be very small, less than one percent. Since Penelec's share of the ownership is smaller than Met-Ed's and Penelec is a larger company, it could anticipate smaller increases to fund clean-up and restoration costs.

Without the return to service of TMI 1, the net increase in revenues required to fund clean-up and restoration costs through rates would be approximately 15% - 25% over current levels for Met-Ed depending on the rate-making treatment afforded various items.

In the scenario with the lower range of increases - return of TMI 1 in 1981 with the ultimate return of TMI 2 reasonably close to schedule and with uninsured clean-up costs not exceeding $934 million - the Company and the Commission would undoubtedly have more flexibility available to manage the level of revenues required. The more unfavorable scenario - up to a 25% increase in revenues with no return of TMI 1 - would probably also be coupled with less stability in revenue requirements due to the continuing dependence on substantial amounts of purchased power.

If clean-up and restoration costs were to be funded entirely through rates, further increases in the clean-up and restoration costs would imply further increases in revenues. If the pessimistic scenario (both units out of service) were extended to encompass an increase in uninsured clean-up costs to $2 billion, the incremental revenues required to fund the costs through current revenues on a pay as you go basis over five years could be as high as 50% over current levels. However, a consideration with this scenario is that it may not be possible to spend $2 billion on clean-up and restoration activities within five years. If the increase related to expanding the scope of work, it is more likely that the clean-up and restoration schedule would be extended and a smaller increase in the annual revenues would be required to fund all costs through rates on a current basis.

These estimates include the full amount of the current rate request which the Company anticipates will provide some earnings. However, these earnings may not restore a financing capability sufficient to resume a capital spending program commensurate with its pre-accident plans. Additionally, under those scenarios based on funding all clean-up and restoration costs through current rates on a pay as you go basis, there would be a commensurate reduction in rates at the end of the clean-up and restoration program.

POTENTIAL IMPACT OF
CLEAN-UP AND RESTORATION COSTS ON
METROPOLITAN EDISON REVENUES
($ Millions)

Item	TMI 1 In Service		TMI 1 Out of Service		Hypothetical Case
	5 year Recovery	20-year Recovery	5-year Recovery	20-year Recovery	5-year Recovery
Cleanup and Restoration Costs (net of insurance)	$934	$934	$934	$934	$2000
Current Annualized Revenues	454	454	454	454	454
Plus: Met-Ed share of cleanup and restoration costs					
- 5 years	93		93		200
- 20 years		50		50	
Current rate request	76	76	76	76	76
Less: Deferred energy cost amortization	(56)	(56)	(56)	(56)	(56)
TMI 1 Replacement Power Costs	(74)	(74)	-	-	-
Adjusted Annualized Revenues	$493	$450	$567	$524	$ 674
% Increase	8.6%	0.8%	24.9%	15.4%	48.5%

Source: TB&A Analysis

A further concern is that if ratepayers fund the clean-up costs they may then find that TMI 2 (or both TMI 1 and 2) will not be allowed to return to service. GPU's customers could then have paid almost $1 billion in clean-up costs only to be faced with continuing replacement power costs which now total $325 million per year for both TMI 1 and 2 for the entire GPU system, and with non-productive investments valued at over $1 billion.

The obligation of ratepayers to fund the clean-up costs has advocates on both sides. One viewpoint is that ratepayers will receive no benefit from the clean-up costs and that such payments are underwriting the risks of investors. On the other hand, it is argued that investors earned no more on a nuclear generating plant than on coal or oil-fired generation but the ratepayers benefited from the low cost of generation. Whatever the outcome of this issue, the total cost of cleanup and restoration would probably be minimized by expediting the pace of the clean-up to the maximum extent feasible.

BANKRUPTCY

Due to the precarious financial position of GPU, various parties have given a considerable amount of attention to the topic of bankruptcy. Some perceive that the bankruptcy courts might provide a suitable forum for dealing with the Company's problems, and that a debtor-in-possesion might provide a vehicle to deal with the multitude of issues which are seemingly unresolvable through existing channels. However, bankruptcy is the most extreme of the possible outcomes to GPU's crisis and the following points should be considered in assessing the prospects of bankruptcy:

- The bankruptcy laws deal only with the financial issues, the debtor in possession will not have summary powers that GPU does not possess to force the NRC to restart TMI 1. It appears highly unlikely that GPU could meet the finanical requirements to qualify for NRC relicensing if in bankruptcy. In fact, it may even find that the license to operate its Oyster Creek nuclear plant is suspended.

- While bankruptcy provides for settling debts at less than the full amount owed, it should be noted that this can arise only from liquidation or from a financial restructuring. When an industrial concern fails, the assets may be sold off either to competitors or to a company in another industry. However the ability of potential customers to substitute or do without the product or service of the bankrupt company is implicit in being able to settle the contractual claims of secured creditors at less than the full amount. It is unthinkable that the courts would allow dissolution of a franchised monopoly providing a vital public service. Consequently, it is the common stockholders' values that are most likely to be impaired. It is likely that stockholder suits would be forthcoming in response to such actions. Further, if attempts were made to sell off assets that would continue in service to the public, they might be sold at fair market value instead of book value. In the electric utility industry, replacement costs, which might be an indicator of fair market

value are generally between two and three times book values. Under bankruptcy of a utility, it is not clear what basis would be used to value assets.

- The debtor in possession during a bankruptcy assumes the authority of the company's Board of Directors, subject to court supervision. The company would be under the protection of the bankruptcy court to ensure that the claims of some creditors are not peremptorily settled at the expense of others. If a moratorium on payments to creditors would allow the distressed company to regain sufficient financial viability to resume payments to creditors, the protection of the courts will also ensure that the company has a reasonable opportunity to reconstitute itself without having its revenue producing ability impoverished by the incursions of creditors in the interim. All of the parties have the right to argue their case before the courts. A major complicating factor in the bankruptcy of a regulated company will be the rights of customers. While the bankruptcy of the railroads did not cause major distress to the public because of the availability of alternate forms of transportation, the electric utility customer does not have ready access to alternate energy sources to replace existing electric service.

- Once an event of default is declared, the interest that accrues on all of the Company's interest bearing obligation is the highest interest rate on the Company's books. The liability for increased interest costs would accrue at the rate of over $70 million per year for GPU. These claims would have to be settled as part of the bankruptcy proceeding.

- It is possible that the debtor in possession during bankruptcy would determine that the interest of all of the parties involved would be best served by leaving the GPU system intact and petition the state regulatory authority for additional rate relief.

- Access to capital markets would no doubt be foreclosed for the duration of a bankruptcy. Consequently, all capital spending requirements for everything from hook-ups for new customers to repairing storm damage would have to be satisfied through rates. It is highly unlikely that the company would be able to pursue a normal capital spending program - let alone the clean-up and restoration of TMI 2 - during the course of bankruptcy.

- The new bankruptcy law has enhanced the standing of secured creditors. How the courts would adjudicate claims that electric service was being provided at less than costs and whether the courts would allow cash collections to be diverted to pay the claims of secured creditors to the detriment of customer service are issues that cannot even be conjectured.

- Finally, bankruptcy would probably halt work on the clean-up of TMI 2; however it would not abrogate GPU's obligations, contractual, moral or otherwise to discharge its clean-up responsibilities. An inability to discharge contractual obligations because of financial distress does not automatically absolve a bankrupt company from its legal liability. If, for example, the Federal Government found it necessary to prosecute and fund the clean-up in order to protect the health and safety of the public, it might also file a claim in the bankruptcy court to recover any costs incurred. Such an event would undoubtedly further complicate an already complex litigation.

In summary, bankruptcy for a major electric operating company involves venturing into the unknown and is likely to lead to higher rates for customers. As stated during TB&A's March 1980 testimony:

> The uncertainies associated with bankruptcy are sufficiently great and pose risks - risks that cannot be completely quantified - to ratepayers, regulators and investors that they should be avoided.

REORGANIZATION OUTSIDE OF CHAPTER 11

Reorganization, a financial restructuring of the GPU system outside of a formal proceeding under Chapter 11 in bankruptcy, would no doubt be complex, lengthy and costly. Furthermore a reorganization, in and of itself, will not solve the problems associated with the clean-up and recovery of TMI 2, nor is it likely to produce lower rates for customers.

Nevertheless, there are two possible reasons for reorganizing the Corporation:

- If it is judged that GPU's financial viability is so severely impaired that its ability to access capital markets in general and equity markets in particular will not recover sufficiently, or rapidly enough, to enable the Company to pursue capital spending program. Under this hypothesis, the operating companies could be sold to other utilities or perhaps spun off as independent companies. If, in the process of doing this, the operating companies could be sold/spun off without their ownership interest in the TMI units and without any clean-up obligations, the separated operating companies, either on the strength of the buying company's credit rating or on their own, would have immediate access to equity and bond markets and could immediately pursue the capacity expansion programs necessary for the franchise areas.

- If it is determined that the outcome of the accident is so uncertain that it would be preferable to shelter ratepayers from potential unfavorable future developments. This scenario would not directly addresss the technical, financial or regulatory problems of clean-up and restoration, let alone questions of public health and safety. However, it might provide a means of isolating the ownership responsibility in one entity separated from ratepayers. In short, such an approach might envision selling/spinning-off all of the assets except

the TMI units and transferring the franchise responsibilities to another legal entity. Ultimately, GPU would be left with both TMI units and the cash proceeds, if any, of the sales/spin-offs.

If, for whatever reason, a reorganization is undertaken, it would probably require supportive regulatory involvement and rate-making assurances or decisions. Favorable regulatory treatment implies increased rates for some or all of the existing ratepayers. It would be necessary to ensure that no responsibility for TMI attached to the new/merged company. This might require assurance that any premium over book value paid for the assets acquired would be allowed for rate-making purposes or assurance of higher returns on equity to a buying/independent company to compensate for the increased business risk. Such actions, which might be necessary incentives, would undoubtedly increase rates. In addition, other issues such as the treatment of deferred energy costs, deferred taxes, investment tax credits, unfunded pension obligations and other employee rights would require negotiation and regulatory.

Any attempt to reorganize would also have to serve the interests of bondholders and preferred stockholders. Without their agreement, a reorganization will fail. And unless productive assets can be sold at prices substantially above book values (i.e., at values reflecting replacement cost vs. historical costs) the concept of a financial reorganization hinges on eviscerating stockholders' values to preserve the values of senior creditors. To the extent this takes place, stockholder suits can be expected. On the other hand, if senior creditors perceive that their values are being impaired, or their protection lessened, they might also take legal action. A reorganization would also require agreement by the SEC, and perhaps also the NRC.

Finally, when the reorganization was complete (assuming it could be accomplished at all), GPU would be a company with two nuclear generating plants, an indeterminant amount of cash, and responsibility for the operation of TMI 1 and the clean-up of TMI 2. Any conceptual, moral or legal obligations to conduct the clean-up would, in practical terms, extend only to the amount of cash then available. Additional funding would very likely still be required, although perhaps not immediately. It is difficult to imagine how the PUC could provide revenues to a company that is not selling energy. This problem could be further compounded if the then remaining GPU determined that whatever cash it then had was insufficient to fund the clean-up beyond the level of insurance available, and was forced to shutdown the clean-up effort.

On the other hand, if some form of third party assistance were provided - or if the net cost to complete clean-up and restoration were then sufficiently limited and NRC relicensing achievable - the Company might be able to either sell the units to another utility, or operate as a generation company supplying power to other utilities.

Another possible outcome is that in the event of abandonment, the Federal Government might be forced to take over the site, or at least TMI 2, to complete the clean-up. When this was completed, however, it is possible that the unit would be maintained as a federally-owned unit, assuming that NRC relicensing was achieved. It is also conceivable that, again assuming successful relicensing, the plant might be auctioned to a utility company.

While it is conceivable that some form of reorganization might be possible, the decision to follow such a course of action will rest on the goals of those in a position to influence the outcome. Cost reduction is not one of the potential benefits, although cost avoidance and risk avoidance might be. A further potential benefit might be earlier access to capital markets than might be achieved otherwise.

One of the overriding considerations must be the expected benefit for the time and effort and costs that would be required. At present (albeit without a detailed study of the option), it does not appear that the expected benefits warrant undertaking a reorganization. However, if TMI 1 will not be allowed to return to service until the clean-up of TMI 2 is completed, and further if it appears that TMI 2 will never be allowed to return to service then closer consideration of a planned reorganization would be warranted.

If sufficient earnings and coverage are not provided in the near term, then the question of a planned reorganization will become academic. It will then only be available at the discretion of the debtor-in-possession during a bankruptcy.

RESTORING GPU's FINANCIAL VIABILITY

If TMI 1 returns to service in the reasonably near future, the outcome likely to require the lowest overall cost and have the least likelihood of adversely impacting customer service resulting from severe financial constraints is to restore the financial viability of GPU. Contrary to popular belief, the revenue increases required to restore the viability of Met-Ed and the GPU System are fractional, not order of magnitude changes.

If TMI 1 returns to service in 1981 and TMI 2 returns close to schedule, then a net increase of less than 10% over current ratepayers levels appears to be sufficient to fund the current estimate of clean-up and restoration costs. The "worst case", namely no return to service for either TMI 1 or 2, would require revenue increases of between 10% and 25% to recover all clean-up and restoration costs, depending on the rate-making treatment of various items and also on whether the costs were financed and amortized over 20 years or paid currently. If the "worst case" scenario were extended to assume that the uninsured cleanup costs would be $2 billion then the revenues might have to be increased by as much as 50% over current levels to fund the costs.

Electric utilities are highly leveraged and under the best of circumstances have limited liquidity. As a result, stable revenues and earnings are far more important to utilities than to most industrial concerns. If

electric utilities must be prepared to withstand the financial shock of a drop in revenues and a loss of earnings, their capital ratios will have to move away from the present 65% fixed income obligations and 35% equity to one that more closely reflects the average for industrials: 35% debt and 65% equity. Such a change in the capital structure of a utility would provide much more flexibility to withstand fluctuations in revenues and earnings without risking a financial crisis. However, several other implications are associated with such a capital restructuring and all of them imply higher rates.

In order to attract equity capital in an environment where dividends may fluctuate and perhaps be eliminated for considerable periods of time and also where the possibility exists that stockholders may have to absorb significant asset write-offs, the financial markets will impose a higher earnings requirement as compensation for the increased investment risk. Compounding the effect on revenue required is the effect of federal income tax. In order to provide an additional dollar of earnings for the common stockholder, almost two dollars in additional revenues are required because of the impact of income taxes. Finally, and perhaps most significantly in terms of revenue requirements, an electric utility would have to satisfy much more of its capital requirements through revenues in order to keep its debt to minimal levels.

Regarding GPU, the factors favoring a restoration of the Company's financial viability emanate from the fact that while it was prudently capitalized within the framework established by the Public Utility Holding Company Act of 1935, and also with respect to the standards of the industry, its capitalization is one geared to providing the benefit of leverage in its cost structure. As such, it does not have the resilience found in companies outside the arena of regulated monopolies. In short, the downside effects of high fixed-costs cannot be long endured by a thinly capitalized corporate giant.

On the other hand, a relatively small increase in revenues can go a long way, if it produces earnings. If TMI 1 returns to service in the near future, all of the currently estimated clean-up costs could be funded with a net rate increase of between zero and 10%. Without the return of TMI 1 the revenue increase required would range between 10% and 25% over current levels. The differences in the ranges for each set of approximations is accounted for principally by the difference between financing the costs over 20 years or current payment over 5 years. Financial assistance from the Federal Government or another third party would reduce the level of increases required.

In addition to avoiding the uncertainties attendant to bankruptcy and the complexities and uncertain benefits of a financial reorganization, there are other compelling arguments favoring the restoration of GPU's viability. First, in addition to clean-up costs the Company still faces substantial capital spending requirements to maintain service to existing customers and provide for future demand. The Company will not be able to proceed with these investment programs if it does not have access to capital markets. The Corporation's equity capital cannot be selectively penalized. Shareholders interests are not compartmentalized and associated with specific

assets and, as such, any impairment of earnings affects all equity holders. But without a healthy equity cushion or adequate coverage ratios, debt financing is impossible. Without the ability to obtain external financing, capital spending must cease.

Another factor favoring restoration of GPU's financial viability is that it is probably the most direct approach to ensuring adequate service to customers at the lowest possible cost and the quickest route to regaining access to capital markets with a subsequent resumption of capital investment. The other possible outcomes would most likely involve complex and lengthy litigation, the outcome of which is difficult to forecast.

In order to regain financial viability for GPU, the following events must take place:

- The major uncertainties now facing the Company must be brought to the fore and resolved expeditiously;

- The Company must achieve adequate earnings and respectable coverage ratios; and

- Dividends on common stock must be resumed.

While the restoration of financial viability to GPU appears to be the best option at present, achieving it might require regulatory precedents that are both innovative and pragmatic. Further, it should be noted that the actions of the NRC will have a significant effect on the ease or difficulty with which it is accomplished. If it is determined that the reasons for requiring a continuing outage of TMI 1 do not bear a reasonable relationship to the costs incurred by the Company, its ratepayers and investors, then other avenues for obtaining Federal assistance should be investigated. Finally, pursuing a course of action to restore the financial health of GPU should not preclude a resolution of those issues of principle and policy that have been raised as a result of the accident at TMI 2.

STRATEGIC RECOMMENDATIONS

The strategic recommendations presented in this section are designed to address the most critical issues confronting GPU today. They are grouped into three approaches which recognize the institutional and time requirements. They are:

- Establish a joint task force composed of the major parties to address the problems

- Develop an interim action plan to stablize GPU's financial position so that sufficient time is available to address the major issues

- Implement an emergency plan to forestall bankruptcy.

JOINT TASK FORCE

Establish a joint task force to analyze the situation, assess the options then and develop and implement a comprehensive plan of action. One of the major obstacles to dealing with the current crisis is the fragmentation of authorities and responsibilities as well as the differing, and sometimes conflicting, interests of the various parties. One approach to overcoming these difficulties, which are largely institutional in nature, would be to establish a joint task force with authoritative representation from the Company, both the commissions and state governments of Pennsylvania and New Jersey, the Federal Government and the electric utility industry.

As the situation currently stands, the state regulatory authorities must bear the brunt of dealing not only with major rate-making issues but also with the side effects of actions taken by Federal regulatory agencies. Furthermore, it is unreasonable to expect those issues which are national in scope and which relate to questions of principle and policy to be addressed without the active participation of the Federal government and its agencies. The issues are also of major importance to the entire electric utility industry, and since some proposed options involve industry participation, it also should be involved.

The creation of a task force would provide a forum for airing all of the issues. It would also provide for improved communication and establish a mechanism for developing a consolidated approach to the multiple facets of the problem. The study proposed to be undertaken by the Department of Energy, as recommended by the GAO, or the initiatives sponsored by the Pennsylvania Congressional delegation, could serve as a starting point for such a group.

Some specific issues which the task force might review and study in greater detail are:

- Bankruptcy;
- Reorganization;
- Restoration of financial viability to GPU;
- Industry involvement;
- Federal financial assistance;
- Federal takeover;
- Legislative initiatives; and
- Creation of a State Power Authority

POOR ORIGINAL

INTERIM ACTION PLAN

GPU management, the Pennsylvania PUC and the New Jersey Board of Public Utilities should jointly conduct an overall assessment of all of the major issues which threaten the Company's continuing viability.

Given the Company's extreme situation and recognizing the institutional constraints governing the procedure for addressing, analyzing and resolving the issues affecting the Company's financial position, it is imperative that an interim plan of action be developed as expeditiously as possible. While each of the major financial issues warrants detailed study, a piecemeal approach to dealing with the problems may allow events to overtake the Company and its regulators. The urgency of the situation requires swift action to ensure that, at a minimum, an economic bridge is constructed to avoid losing control over events. This interim action plan would provide GPU with financial stability pending the complete resolution of the issues by the joint task force. However, the institutional constraints of the regulatory process may not allow this issue to be raised in Pennsylvania prior to completion of the current Met-Ed and Penelec rate cases in March or April of 1981. Additional time may also be required to accommodate the due process requirements of the regulatory environment.

EMERGENCY PLAN

The Company should be prepared to implement an emergency cash reduction and cash flow conservation program to forestall bankruptcy if the due process requirements of regulation will not allow for resolution of the major issues. Implementation of such a program will extend the time available to the various parties to resolve the issues.

The sole objective of such a program would be to buy time; extending an event of default for several additional months may be sufficient to allow an orderly resolution of the crisis within the framework of regulation. The impact of any actions on current levels of service or future costs would have to be subordinated to the immediate, in fact, sole objective: cut costs and preserve cash. Elements of a crash program would include:

- Manpower reductions: Workforce reductions should be considered for all but the most essential functions.

- Sell unpledged and unencumbered assets: To the extent that the Company can sell assets such as its inventories of coal, fuel oil and the unpledged portion of its uranium it will be able to raise cash to contribute to its short-term working capital requirements. Actions such as these are necessarily short-sighted in that the inventories will probably require replenishment in the future, however, in order to provide the margin necessary to avoid bankruptcy they may be unavoidable.

- Halt all construction spending: While the Company has slashed its major construction programs, there are still ongoing expenditures which might be eliminated to further reduce cash requirements. Implementing such actions might require suspension of new customer hook-ups and a halt to the NRC required modifications to TMI 1 and perhaps also the clean-up of TMI 2.

The severe cost-cutting measures outlined above would have to be implemented in a company that has recently undergone several successive cost reduction programs. An emergency program as outlined above would undoubtedly create additional problems for the future -- perhaps the near future -- and their effects on future service cannot be estimated. Furthermore, the benefit of extending the life of the Company for a short time must be weighed against the difficulty of undoing the side effects of the emergency actions. Despite these concerns, the Company should give consideration to implementing such an emergency program.

Note: In late September 1980 the Company announced plans to lay off approximately 700 workers including over 200 GPU employees.

IV-ENERGY

BACKGROUND

During the past decade, as unprecedented changes transpired in the fuels area, GPU aggressively pursued its fuel related opportunities. Furthermore, its generation planning resulted in a low cost fuel mix that would have been almost optimal if the TMI accident had not occurred.

This section discusses relevant issues and developments related to: pricing of oil, coal and uranium; natural gas supplies and regulation; and pricing of interchange power. It also presents an analysis of load versus capacity for the GPU System and a review of opportunities for Pennsylvania to benefit from the country's efforts to displace oil with coal-based fuels.

OIL

During the 1970's, the world cost of crude oil increased more than fifteen fold, from less than $2 per barrel to more than $30 per barrel. The full impact of this increase has only recently been felt in the United States. Crude oil price controls and the entitlements program, which in effect subsidized OPEC oil imports, significantly moderated the increases for domestic consumers. This situation will not continue. Oil price controls are being phased out and will end in late 1981.

Unfortunately, while the prospect of crude oil decontrol has stimulated domestic exploration and drilling activity to near record levels, the results have been disappointing. Department of Energy and leading petroleum company forecasters are now predicting significant declines in domestic oil production in the 1980's even with the full crude oil price decontrol and widespread use of exotic oil recovery techniques. This, in turn, will generate enormous pressures on the country to accelerate its transition to a non-oil based economy and make major improvements in the efficiency of its energy utilization. Imaginative exploitation of alternatives might help to reduce somewhat the rate of increase in the costs of electricity to Pennsylvania's ratepayers. These alternatives are explored at the end of this section.

COAL

During the mid 1970's coal prices fluctuated greatly. U. S. average contract prices increased 40% in 1974 and 34% in 1975. U. S. average spot prices increased 144% in 1974 but declined 9% in 1975. These gyrations were largely due to panic buying in response to the oil embargo, and concern over the reliability of supplies during coal strikes. In the late 1970's the market became more stable, with prices rising essentially in step with inflation induced production cost increases.

In the unstable coal market environment of 1974 and 1975 a number of utilities including Met-Ed and Penelec, did not diligently enforce their contractual rights against defaulting coal suppliers. With regard to Met-Ed's coal procurement activities in 1974, the Pennsylvania Public Utility Commission found that there was insufficient justification for its failure to enforce its coal contract pricing provisions. The Commission recently ordered Met-Ed to refund to customers through the fuel adjustment clause $3.6 million plus interest in unjustified coal price overcharges. Met-Ed has appealed this order. Met Ed's coal procurement practices in 1975, and Penelec's coal procurement practices in 1974 and 1975, are still under investigation by the Commission. The dollar amounts involved in these investigations are small in comparison to total coal purchases.

URANIUM

During the mid 1970's uranium oxide prices rose from less than $8 per pound to more than $40 per pound. During the same period, producers of nuclear reactors and fuel assemblies such as Westinghouse and Exxon, unilaterally reneged on their obligations to supply nuclear fuel at prices that had been negotiated before uranium oxide experienced its five-fold price escalation. Many of the litigations arising out of the failure by suppliers to deliver fuel at contract prices have been settled. Usually the defaulting supplier has offered a package of cash, services, products it produces and uranium such that the value to the utility agreeing to the settlement is significantly greater than the cost to the defaulting supplier. GPU is involved in extensive litigation with Exxon related to the pricing of uranium for Jersey Central Power & Light's Oyster Creek plant. To date, despite prelitigation attempts at a resolution of the dispute, there has been no significant movement toward a settlement.

The Westinghouse default of nuclear fuel supplies resulted in extensive efforts by the utility industry to secure nuclear fuel on a long term basis; additionally, government requirements for enrichment service contracts compounded the price escalation impact of the cartel. This market situation has been almost completely reversed within the past year. The large number of nuclear plant deferrals and cancellations, coupled with TMI related uncertainties, drove down the price of uranium oxide from about $40 per pound at the end of 1979 to approximately $32 per pound in July 1980. Furthermore, a large amount of uranium mining capacity has been installed worldwide in response to high pre-TMI uranium prices, and this capacity may inhibit any significant price escalations in the future. In fact, the soft market, excess capacity situation and production cost uncertainties apparently caused Gulf Oil to terminate the development of its large Mt. Taylor uranium mine after investing over $200 million.

NATURAL GAS

The passage of the Natural Gas Policy Act (NGPA) late in 1978 resulted in a partial decontrol of natural gas prices which will become fully effective in 1985 for new gas discovered since 1978. In contrast to the

situation in crude oil, the partial decontrol has resulted in significant increases in domestic gas production. In those areas where gas supplies are obtained largely from domestic sources (such as the GPU service area), natural gas is much cheaper than number 2 fuel oil, diesel fuel or low sulfur residual oil. Furthermore, gas is much easier to use and causes fewer environmental compliance problems than alternative fuels. These advantages of gas, coupled with the extreme uncertainty in oil supplies, have generated an enormous demand for conversions from oil to gas throughout the country on the part of residential consumers, industry and utilities. As a result, the current surplus or "gas bubble" that resulted from the passage of NGPA may soon be consumed, and curtailments of interstate pipeline supplies may soon be resumed. Consequently, pipeline suppliers will not guarantee the availability of gas on a firm basis even though there is currently a surplus.

The Federal Energy Regulatory Commission (FERC) has established a natural gas curtailment priority system whereby residential service is assigned the highest priority and large industrial boiler fuel service the lowest. Within this set of priorities are some further gradations. For example, agriculture has a higher priority than industry in general and the textile industry, because of its relationship to agriculture, also has a higher curtailment priority than general industry. Should large pipeline gas curtailments again become necessary, securing a higher priority classification for a user's gas supply will become increasingly valuable. As discussed in the strategic recommendations section, this fact might possibly be exploited by GPU to foster the Company's load management and conservation objectives.

POWER POOLS

The GPU group is a full member of the Pennsylvania Jersey Maryland Interconnect (PJM), and the three individual GPU companies are signatories to the agreement. Power pool membership allows member companies to achieve fuel cost savings since the most economic generation in the pool is dispatched to meet the pool-wide load at any given time (economic dispatch). The pool members pay for power purchased from the pool and are compensated for power sold to the pool, using the split savings method for pricing such interchanged power. The split savings price is based on a marginal cost approach and is essentially an average of the highest cost generation being sold in the pool at a given time, and the cost that the purchasing utility would have to pay to generate the power if it were not able to purchase it from the pool. This method of pricing is specified by the agreements governing PJM membership, and has been approved as a tariff by FERC under its authority to regulate electricity sold to other than ultimate customers. Split savings pricing is one of the pricing methods typically used by power pools throughout the country. Another pricing method is often used for emergency sales of power which are typically priced at 110% of the selling utility's marginal cost of generation.

The PJM interchange pricing algorithm has four major consequences that impact net interchange purchasers within PJM, including GPU.

- The price of interchange power is based to a significant extent on oil-fired generation costs. Although PJM has considerable coal and nuclear capacity, there are also many oil-fired plants in the system which constitute the most expensive base load generation in PJM. The cost of fuel for these oil-fired plants is averaged with the purchasing utility's alternate generation cost under split savings since the entire PJM load often cannot be met entirely from its coal and nuclear generation. Even if pricing were done on a cost rather than on a split savings basis, the price of interchange power would still be based to a significant extent on oil-fired generation costs.

- The split savings feature imposes additional penalties upon GPU. Because the GPU System is short of base load capacity in the absence of TMI, its alternate generation cost is the cost of generation via combustion turbine peaking units. These units use very expensive number 2 oil and also have a significantly higher heat rate than base load units. This results in a very high alternate generation cost which is averaged with the highest PJM generation cost being used to meet the load to determine the price of GPU's purchase of PJM interchange power at any given time. The split savings penalty is greatest at those times when low cost (coal or nuclear) interchange power is available.

- Since the PJM interchange pricing formula has been approved by FERC as a wholesale electric tariff, it can be changed only by unanimous agreement of all PJM members or as a result of a formal FERC hearing. The latter proceeding can take many years before all potential appeals and court challenges are resolved.

- Since the GPU group is a full PJM member and Penelec, Met-Ed and Jersey Central are signatories, the individual companies account for interchange power purchases and sales among themselves before the GPU System accounts for interchange transactions with PJM. The interchange accounting among the GPU companies is done at cost under the GPU power pooling contract (which has been approved by FERC). The Pennsylvania companies are net sellers to Jersey Central. If the Pennsylvania GPU companies were individual members of PJM rather than associate members of the GPU group, they and their ratepayers would realize a premium from split savings pricing of their interchange power sales to Jersey Central, as long as split savings pricing is approved by FERC. Conversely they would lose the benefits derived from the GPU power pooling contract. Also it would not be legal for Penelec to charge another GPU member company for wheeling this energy because under the Holding Companies Act transactions of this type are to be billed at cost.

It should be noted that prior to the accident, GPU had attempted to increase Jersey Central's share of TMI ownership and reduce its share of Forked River to provide a better balance among member companies' generation. The Pennsylvania Commission did not approve GPU's application for this change in ownership. Furthermore, since the accident Penelec has not had sufficient generation to meet its net system requirements (between January and June of 1980 Penelec generated only 5,529 GWH of its 6,264 GWH net system requirements). It appears, therefore, that Penelec's sales to Jersey Central have been primarily from Penelec's excess purchased power rather than from Penelec's own generation.

GPU SYSTEM LOAD AND CAPACITY

GPU's net generation, net power purchased and interchanged, and total net system requirements for 1977 through 1979 were as follows:

	Thousands of MWH		
	1977	1978	1979
Net Generation	26,576	29,747	26,891
Power Purchased and Interchanged (net)	5,926	4,275	7,982
Total Net System Requirements	32,502	34,022	34,873

The variation in net generation from year to year reflects the interaction of performance factors, as discussed in the section on Power Production. The addition of Homer City Unit 3 accounted for a jump in generating capacity in 1978, and the TMI accident accounted for a decrease of generating capacity in 1979. If the accident had not occurred, GPU would have been a net energy seller. However, with the loss of TMI the shortfall in generating capacity increased in 1979 by almost 87%. Some of this shortfall could be met through increased generation from older, less efficient power plants, but it would be more costly and have an adverse effect on GPU's cash flow.

During the last five years, even with conservation efforts and rapidly rising energy costs, growth of demand in the GPU System has varied between 2.5 and 7%. It is realistic to project that unconstrained, overall demand will continue to grow from 2 to 4% each year for the next five years. The absolute magnitude of the growth will depend not only on the success of conservation efforts and the rate at which energy prices rise, but also on the number of new industries and customers that locate within the GPU system. GPU's Master Plan for Load Management and Conservation projects a 1.5% growth in summer peak demand, but anticipates most of the reduction in the growth of summer peak will not occur until the 1985-1990 period.

TB&A analyzed the projected growth in demand and net generation of the Pennsylvania companies for the next 5 years. This analysis assumed increases in load growth of 2% and 5% and increases in net generation of 3% per year with and without TMI 1 on-line. Under this scenario, the 3% increase in generation would have to come from increased system efficiency and reliability. While this is theoretically achievable it will require considerable management effort and assumes the availability of funds for capital improvements. Annual net generation could increase if decreases occurred in the number of megawatt hours lost to forced and partial outages and to economic system dispatch.

Overall GPU will continue to face a lack of economic capacity (i.e., power that can be produced at a lower cost than available purchased power) even with TMI 1 on line, until additional generating units can be built. The Pennsylvania companies face the same situation, although they are in a slightly better position than the overall GPU system because of Penelec's capacity.

Jersey Central Power & Light Company (JCP&L) is the GPU subsidiary that has the most severe shortfall of economic generating capacity. Even before the loss of TMI, JCP&L was purchasing monthly net amounts of from 350,000 to 500,000 MWH. During all of 1979 JCP&L purchased net 5.3 million MWH of electricity, Met-Ed purchased 3.4 million MWH and Penelec had net sales of 0.7 million MWH. Should both of the TMI units come back on line soon, Met-Ed's economic capacity will closely approximate its demand, but Jersey Central will still be forced to buy considerable amounts of power.

PENNSYLVANIA'S OPPORTUNITIES

Pennsylvania is in a strong position to benefit from certain emerging trends in the U.S. energy situation. The country is committed to a reduction in its dependence on OPEC and, as the commitments made at the recent Venice Economic Summit indicate, increasing the usage of coal and the efficiency of energy utilization are key elements in achieving this reduction. Increasing the usage of coal, however, will require the solution of difficult environmental problems. There is a growing concern that the acid rain produced by the combustion of sulfur impurities in coal will cause extensive damage to lakes and rivers in the Northern Hemisphere. Two of the more conventional solutions to this problem, the use of low sulfur coal and the use of flue gas scrubbers, are of limited applicability in the Northeast. Reserves of low sulfur coal are very limited in the Eastern U.S., and high transportation costs make it impractical for Eastern utilities to burn low sulfur Western coal. Many of the East's oil fired generation plants that can be converted to coal do not have the space available to permanently store the enormous amount of sludge produced by flue gas scrubbers. Furthermore, the growing national concern about the dangers of toxic wastes will make it increasingly difficult and expensive to permanently store scrubber sludge in densely populated regions such as the Northeast.

Because the largest potential for displacing oil with coal in electric generation is on the East Coast, pressures will increase to develop innovative solutions to the coal conversion and environmental protection problems. Coal cleaning and coal gasification are two technologies that can be used to solve these problems and, because both involve the use of large quantities of process heat, they offer potential cogeneration opportunities. Pennsylvania's large coal reserves and central location in the Eastern part of the country put it in a strong position to develop a coal cleaning/coal gasification/cogeneration industry. Given the national urgency of reducing our dependence on OPEC while avoiding environmental degradation, Federal support might be secured to develop a synfuels industry in Pennsylvania. The electricity produced by such an industry, in turn, might reduce the need for GPU to build additional conventional generation during the 1980's. GPU has been active in coal cleaning technology. The Homer City Unit 3 employs an innovative coal cleaning process, and the EPRI R&D coal cleaning facility has been located at Homer City.

KEY ISSUE ANALYSIS

This section of the chapter discusses the four key energy related issues confronting GPU:

- Power Production
- Fuels
- Purchased Power
- Load Management and Conservation.

POWER PRODUCTION

GPU has generating facilities with the net installed capacity shown in Exhibit IV-1. These facilities represent a broad range of size and fuel mix although the GPU system would depend primarily on coal (67%) and nuclear (25%) if TMI 1 and 2 were operating.

The accident at TMI 2 represented a loss of 1,706 megawatts of winter generating capacity from the GPU system and has put a strain on GPU's fossil-fired units. To the extent that those units cannot provide economic capacity, power must be purchased from other utilities to meet demand requirements.

Available data was reviewed to assess whether GPU's emphasis on the nuclear generating stations resulted in a deterioration in the capabilities of its fossil generating stations and to evaluate the extent to which improvements in plant productivity might be achieved and reduce GPU's purchased power needs.

Plant Performance Analysis

The performance of individual units at the following seven major generating stations owned by Met-Ed and/or Penelec was analyzed for the five year period from 1975 to 1979:

GPU EXISTING NET INSTALLED CAPACITY
SUMMER RATINGS AS OF MAY 1980

PN Units (MW)		ME Units (MW)		JC Units (MW)	
Homer City 1, 2 & 3	(942)	Conemaugh 1 & 2	(280)	Keystone 1 & 2	(28
Seward 5	(136)	Portland 1 & 2	(401)	Oyster Creek 1	(62
Shawville 1-4	(606)	Three Mile Island 1	(388)	Three Mile Island 1	(19
Three Mile Island 1	(194)	Three Mile Island 2	(440)	Three Mile Island 2	(22
Three Mile Island 2	(220)	York Haven 1-20	(19)		
Warren 1 & 2	(86)				
Williamsburg 5	(33)				
Total Base	(2 217)	Total Base	(1 528)	Total Base	(1 31
Front St. 1-5	(118)	Titus 1-3	(234)	Gilbert 3	(7
Seward 4	(62)			Gilbert 4-8	(33
				Sayreville 4 & 5	(24
				Werner 4	(5
Total Intermediate	(180)	Total Intermediate	(234)	Total Intermediate	(70
Total Base + Inter.	(2 397)	Total Base + Inter.	(1 762)	Total Base + Inter.	(2 01
Deep Creek 1 & 2	(18)	Combustion Turbines	(266)	Gilbert 1 & 2	(4
Piney 1-3	(27)	Diesels	(2)	Sayreville 1-3	(8
Seneca 1-3	(76)			Yards Creek 1-3	(16
Combustion Turbines	(130)			Combustion Turbines	(70
Diesels	(13)			Diesels	(
Total Peaking	(264	Total Peaking	(268)	Total Peaking	(99
Total Capacity	(2 661)	Total Capacity	(2 030)	Total Capacity	(3 01

Total GPU Capacity: 7 707 MW

Definitions:

- Base - Normally to economic to run 24 hrs/day, 7 days/wk.
- Intermediate - Averages more than 12 hrs/wk.day but less than 24 hrs/day, 7 days/wk.
- Peaking - Normally ave ges less than 12 hrs/wk. day.

- Homer City
- Conemaugh
- Showville
- Seward
- Portland
- Titus
- Front Street

Analyzing plant performance is difficult because no one indicator gives a precise picture of the efficiency of a generating unit or which elements affecting that efficiency are controllable. Various factors affect a unit's efficiency, such as:

- Design - The trend toward bigger, more sophisticated units created maintenance problems attributable to the actual design of the units. These problems affect generation capabilities, particularly in the early years of a unit's life, and may require considerable manpower and financial resources to "work out the bugs."

- Utility Involvement in Construction - To the degree that utility management becomes involved in monitoring and assisting contractors during construction, future operation and maintenance problems can often be foreseen and avoided.

- Ability of the Operators - Operating a plant at peak efficiency and anticipating emergencies and maintenance problems depends on the many factors that affect plant operators such as training, turnover rate, management effort and morale.

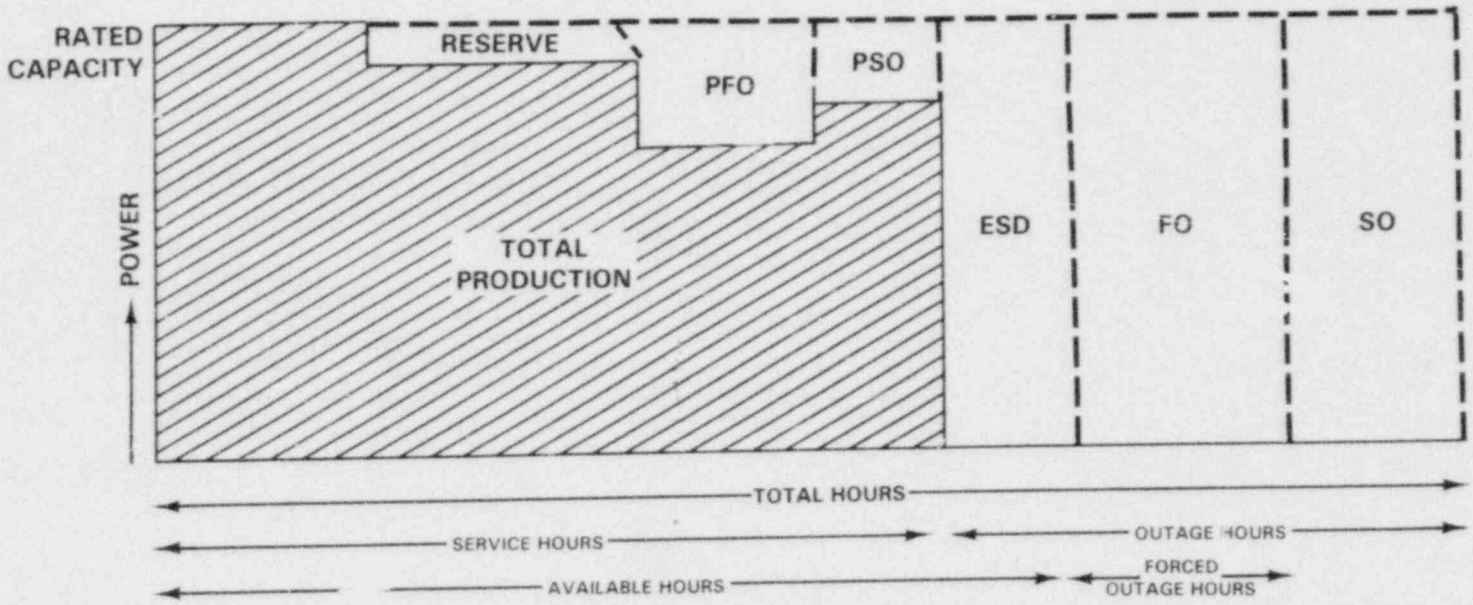
- Maintenance - An important determinant of plant availability and efficiency is the effectiveness of long-term preventive and predictive maintenance. The ability of maintenance to respond to emergencies and breakdowns is important, but the very need for such responses is indicative of deeper maintenance problems.

- Size and Type of Equipment, and Conditions - Several equipment factors affect plant performance such as mature versus immature units, cyclic versus base load units, once-through versus drum type boilers, steam temperatures, megawatt size of the unit, and type and quality of fuel used.

Because of the above variables, as well as the inconsistency of the data reported by utilities to EEI, direct comparisons between units are tenuous. Overall comparisons can be made, however, and by reviewing trends in various plant performance indicators, the benefits and costs of plant improvement programs can be evaluated. Exhibit IV-2 graphically presents the factors that affect the productivity of power plants.

The operating cost of producing electric power in any particular unit depends on the unit's relative efficiency and the cost of fuel. For this reason, the larger, newer units (which are generally more fuel efficient)

FACTORS AFFECTING THE PRODUCTIVITY OF POWER PLANTS



PFO – PARTIAL FORCED OUTAGE (OPERATING PROBLEMS FORCE LOAD REDUCTION)
PSO – PARTIAL SCHEDULED OUTAGE (LOAD REDUCTION TO PERMIT MAINTENANCE, AND SO ON)
ESD – ECONOMY SHUTDOWN (NOT ECONOMICAL TO GENERATE)
FO – FORCED OUTAGES (EQUIPMENT FAILURES, ACCIDENTS, ENVIRONMENTAL FACTORS)
SO – SCHEDULED OUTAGES (ROUTINE OR PLANNED MAINTENANCE, INSPECTION, AND SO ON)

EXHIBIT IV-2

are baseloaded while the older units are used more for intermediate or peak loads. Likewise units using cheaper fuel (uranium and coal) are used more than those that burn expensive fuels (such as oil and natural gas). Exhibit IV-3 shows the fuel costs per KWH for the various GPU generating plants during 1979.

The main purpose of this performance analysis was to determine whether the generating plants were showing signs of deterioration. For that reason, the indicators that were selected enable each plant to be clearly compared to itself rather than to the industry as a whole. The performance indices used here also focused on some factors that would predict future equipment problems. Whenever possible, megawatt hours lost, as opposed to ratios, were used to emphasize the economic impact of unit downtime. The six performance indices used for the analysis were as follows:

- Heat Rate - plant efficiency as measured by BTU per KWH generated.

- MWH Lost to Forced Outage - the amount of power lost because of full or partial forced outages.

- MWH Lost to Planned Outage - the amount of power lost because of full or partial planned outages.

- MWH Lost to Economic System Dispatch - the amount of power that the unit was capable of delivering, but did not deliver because a lack of demand did not make it economically justifiable to do so.

- Contractor Costs - the annual amount spent on outside contractors for maintenance or equipment additions.

- Maintenance Overtime - the total manhours of overtime spent by maintenance personnel.

Individually these indicators do not necessarily present an accurate picture of power plant performance. Taken together, however, they can give an overall indication of the effectiveness of any unit over time. Heat rates and MWH lost to forced outage give the best overall indication of the efficiency of a plant and how well it has been maintained. Deteriorating trends in these two indices indicate problem areas that need to be addressed. The other four indices are used primarily to gain a better overall picture of the conditions that impact plant operations. Megawatt-hours lost to planned outages are to be expected and in some years may show a jump because of major overhaul work that occurs only once every four or five years. Upward trends, however, can indicate that additional work is being deferred for these outages (a partial result of increased maintenance problems) or that the craft maintenance work force is not being properly managed.

Additional maintenance requirements can be met by the use of contractors or by increased maintenance overtime. An upward trend in these two indices might suggest that maintenance problems are increasing and may be reflected

FUEL COST COMPARISON

Station	Fuel	Average Cost Per Million BTU	Heat Rate	Fuel Cost Per KWH (Mills)
Three Mile Island	Nuclear	14.43¢	11,246	1.62
Oyster Creek	Nuclear	30.90	10,351	3.20
Keystone	Coal	119.25	9,952	11.87
Homer City	Coal	119.25	10,133	12.08
Conemaugh	Coal	119.25	10,161	12.12
Shawville	Coal	119.25	10,835	12.92
Seward	Coal/Oil	119.25	11,168	13.32
Portland	Coal	142.02	10,448	14.84
Titus	Coal	142.02	10,575	15.02
Warren	Coal	119.25	13,053	15.57
Williamsburg	Coal	119.25	13,133	15.67
Front St.	Coal	119.25	13,526	16.13
Sayerville	Gas/Oil	273.10	11,045	30.16
Werner	Gas/Oil	273.10	11,402	31.14
Gilbert	Oil	318.40	12,315	39.21
Combustion Turbines	Gas/Oil	239.03	11,533 to 22,606	27.57 to 54.04

Source: TB&A analysis of 1979 data.

EXHIBIT IV-

in higher planned and forced outage rates in the future. Megawatthours lost to economic dispatch indicates the demand for a unit's generating capacity; an upward trend indicates that the demand for a unit's generation is declining.

Exhibit IV-4 summarizes, in narrative form, highlights of the performance analysis for the Homer City, Conemaugh, Shawville, Seward, Portland, Titus, and Front Street plants. Overall performance trends deteriorated in 1977 and 1978 but improved in 1979. The deteriorating trends in 1977 and 1978 may have resulted from a lack of attention to the units in previous years, from various equipment design problems, devoting resources to bring new plants on line, environmental compliance programs or from a combination of these factors. The trends also seem to correspond to budget restrictions during 1977 and 1978 and the subsequent renewed appreciation of coal as a major generating source. The one station that seems to be continuing to deteriorate is Met-Ed's Portland Generating Station. Application of Penelec's resources toward reversing these trends would be one major benefit of the proposed Penelec-Met-Ed management combination. A Generation Productivity department was established in the GPU Service Company in June 1978. This department initiated programs to improve plant reliability, output and thermal efficiency. Its resources were dedicated to the solution of TMI related problems in March 1979, and the department was disbanded in July 1979.

Fossil Generating Plant Performance Improvement Programs

In recent years, GPU, and specifically Penelec, has developed and implement various plant performance improvement programs. The most significant of these are described below:

- Outage Planning - GPU established an internal committee, made up of members of the three operating companies, to draft a generic document on outage planning and scheduling. Using this document as a guide, each operating company developed its own specific procedures. These procedures are currently being performed manually but there are plans to automate them in the future.

- Station Operating Procedures - More specific operating procedures are being developed. These procedures cover unit start-up, shut-down and emergencies as well as normal operations for optimal thermal efficiency. There are no sign-off or testing procedures but Penelec management intends to include such procedures in future labor contract negotiations.

- Generation Maintenance System (GMS) - Met Ed generating stations have recently implemented an automated maintenance system covering planned maintenance and breakdown work. Penelec is in the final stages of implementing a planned maintenance system in all of its plants. Penelec expects GMS to be implemented in 1981.

HIGHLIGHTS OF PLANT PERFORMANCE ANALYSIS

HOMER CITY (Units 1 and 2 only)

- o High forced outage rates in 1976-77 indicate equipment problems that seem to have been resolved.
- o High planned outage rate, contractor costs, and maintenance overtime indicate that major work was undertaken in 1978. This resulted in improved performance in these areas in 1979.
- o Heat rate is gradually declining, indicating improved operations and maintenance.

CONEMAUGH

- o Increasing forced outage rates in 1977-78 indicates serious equipment and maintenance problems. The trend began to reverse in 1979 but is still high.
- o The rise in heat rates in 1977-78 indicates plant deterioration. A decrease in heat rate in 1979 indicates some improvement.
- o Planned outage rates, heat rates, contractor costs and maintenance overtime data indicate that much work was done in 1979 to improve deteriorating trends in plant performance.
- o Overall, significant problems appear to have been resolved in 1978, and better performance trends should be expected in the future.

SHAWVILLE

- o Increasing forced outage rates through 1978 indicate increased equipment and maintenance problems during that period. 1979 marked the beginning of a turnaround.
- o Heat rate increased in 1978 but seems to have leveled off. Increase in heat rates may have been the result of equipment additions (e.g., pollution control devices) but need to be improved.
- o Decreasing number of MWH's lost to economic system dispatch indicates an increased need for Shawville power and would justify increased efforts to upgrade plant performance.

SEWARD

- 1977-78 showed a jump in forced outage rates, indicating equipment and maintenance problems in those years which were possibly caused by the severe area flood. This was preceded in 1976 by a high planned outage rate (probably completed by outside contractors since that cost also jumped in 1976).

- Increased overtime corresponds to increased forced outage rate in 1977. This may be of a result of flood restoration work.

- Heat rates seem to be improving, particularly in 1979. This would indicate improving operations and maintenance.

- Increase in MWH's lost to economic system dispatch would indicate that Seward's power is becoming increasingly more costly vis-a-vis other generating stations. Additional resources to upgrade facilities and improve plant performance may not be justified.

PORTLAND

- Forced outage rate had been constant but a large jump in 1979 indicates equipment and maintenance problems that may not have been resolved. This corresponds to significant increases in maintenance overtime in 1978-79.

- Heat rate has held constant through the five year period. Substantial reduction in the amount of planned outage work in recent years may contribute to future problems.

- Sharp declines in MWH's lost to economic system dispatch indicates increasing needs for Portland's power.

TITUS

- An exceptional jump in the forced outage rate in 1978 indicates considerable equipment and maintenance problems.

- Heat rate has shown an overall increasing trend although it did decrease in 1979. The overall increase indicates possible general declines in operations, maintenance, and condition of the plant.

- All trends improved in 1979.

FRONT STREET

- High forced outage rate and contractor costs in 1977 indicate equipment problems in that year.
- Heat rates are showing a general decline indicating the condition and operation of the plant are improving.
- Maintenance overtime has generally increased year to year, perhaps as a result of increased attention to the condition of the plant or improper maintenance scheduling.

- Generation Productivity Improvement Program (GPIP) - GPIP involves the development and implementation of two automated programs - RAM (Reliability, Availability, Maintainability) and PEPSE (Performance Evaluation of Power System Efficiency). RAM is an automated system to maintain EEI requested performance data. A planned phase two to this program calls for an interface with the GMS system to facilitate equipment maintenance analysis. PEPSE is a computer modeling program that projects the impact on system heat rate from changes made to specific pieces of equipment. The first phase was scheduled for implementation in late 1979 but has been delayed; it will cover the turbine, heaters and associated equipment. A planned second phase will include the boilers and associated equipment.

- Generation Thermal Performance Improvement Program (GTPIP) - This program is designed to prepare operators to maintain peak thermal efficiency on an hourly basis. The development of this program is approximately 50% complete. This program provides performance curves of various operating parameters at all loads to guide operators in interpreting hourly readings.

- Generation Unit Performance Testing - Penelec has developed a comprehensive equipment testing program for four main equipment areas (turbine, air heater, feed water heater, and boiler). Staff engineers and plant engineers perform the equipment tests. The program is not being fully carried out at present due to manpower constraints. Penelec is also in the process of centralizing some test stations to reduce the time and manpower needed to complete these tests. Written procedures have been issued for all electrical tests and are in draft form for all mechanical tests.

FUELS

GPU uses the full spectrum of generation fuels: uranium, coal, oil, and natural gas. As with most integrated utilities, fuel represents a major portion of total revenue requirements. In 1979, total fuel expenditures were almost $346 million, or 23% of total system revenue requirements.

The most significant fuel-related issues are:

- The Exxon uranium pricing litigation
- GPU's uranium inventory position
- GPU's coal reserves
- Conversion of combustion turbines to dual fire natural gas and oil
- Fuel cost reduction and procurement efforts

The Exxon Uranium Pricing Litigation

GPU is in litigation with Exxon concerning the pricing of uranium and fabrication services for Jersey Central's Oyster Creek Plant. GPU's General

Counsel believes that GPU's case has merit; however, many of the facts related to the case were not made available on the grounds of client/attorney confidentiality. Exxon continued supplying uranium, in spite of its pricing dispute with GPU, until December 1978. In November 1978 Exxon submitted bills for $33 million for reloads supplied in 1977 and 1978 and to be supplied in 1979. GPU claims that approximately $29 million of those bills are not justified. There is also a dispute over the pricing of uranium oxide and fabrication services for six annual reloads that were to be delivered after November 1979.

Prior to filing the suit GPU attempted to move the dispute toward settlement rather than litigation. Meetings were held between GPU and Exxon top management over the course of a year in an effort to develop a mutually satisfactory basis for settlement. GPU management has indicated that Exxon demonstrated little willingness to compromise. The recent sharp declines in uranium prices may further decrease Exxon's incentive to reach a settlement.

GPU's Uranium Inventory Position

GPU owns certain uranium inventories and coal reserves that it might be able to sell or pledge as loan collateral. There are, however, certain restrictions concerning such conversion. First, the debentures of three operating companies have negative pledge provisions. These prevent pledging of any property owned or thereafter acquired unless the company makes effective provision to secure the outstanding debentures equally and rataoly with other indebtedness which is to be secured by such pledge. Second, the debentures of Metropolitan Edison and Jersey Central contain an exception that allows pledging to secure short-term, less than one year maturity, indebtedness under certain conditions, but the debentures of Penelec do not contain such an exception. This exception allowed certain Met-Ed and Jersey Central uranium inventories to be pledged to secure the Revolving Credit Agreement negotiated after the Three Mile Island accident. Restrictions in the debenture indentures prevent the companies from selling their property substantially as an entirety. It is not clear whether those restrictions prevent the Company from selling piece-meal assets, such as uranium inventories and coal reserves. Further, the sale of some of this inventory, if acheivable, will need to be weighed against maintaining prudent operating supplies.

GPU has uranium inventories in three different forms at separate locations:

- At Kerr-McGee there are 1,062,500 lbs of Jersey Central material and 975,000 lbs of Met-Ed material. These inventories were used to secure the Revolving Credit Agreement. In addition, there were 362,500 lbs of Penelec material that could not be pledged. Assuming the Penelec material could be sold for $27 per pound, almost $10 million could be realized.

- At DOE there are 812,500 lbs of Jersey Central material, 125,000 lbs of Met-Ed material and 62,000 lbs of Penelec material. The General Counsel has indicated that it might be legally possible to sell this material without the consent of the banks participating in the Revolving Credit Agreement and without applying the net proceeds of the sale to the repayment of the borrowings under that agreement. However, the General Counsel is concerned that such action might endanger the continuing financial support of the participating banks. The General Counsel was also of the opinion that the U.S. Government contracts pursuant to which the material was held at DOE do not provide a convenient mechanism for pledging it. The sale of the material would require a release from the first mortgage bond liens. If the material could be sold for $27 per pound, GPU would raise almost $27 million.

- There are two fabricated fuel reloads in inventory. These were fabricated for reload #1 of TMI 2 and reload #5 of TMI 1. These are owned 25% by Penelec, 25% by Jersey Central, and 50% by Met-Ed. According to GPU, these are each worth at least $25 million. This material is not currently pledged to secure indebtedness; however, it is much less fungible than other uranium inventories. It can be used only in a B&W reactor of the same design as the TMI units, a fact that may make them unmarketable or require a steep discount to realize their sale. GPU approached other B&W reactor owners in the summer and found no interest in purchasing the reloads. Discussions are currently underway with another utility for sale of small amounts of uranium.

The above amounts of potential cash realizations are gross figures and do not consider the amount of money paid for the material nor the carrying charges accrued to date. GPU's uranium inventory planning had been oriented toward a conservative two to three year forward inventory position. It had opened a New Mexico office in 1977 when uranium was difficult to obtain and closed it as a result of the TMI accident. The indefinite suspension of Forked River and the TMI accident resulted in a long uranium inventory position. If both TMI units are allowed to resume operations and a new core is fabricated for TMI 2, the Company does not need new uranium supplies until at least 1985. If the TMI units are not brought back into service, current uranium inventories will represent about a 15-year supply.

Since the TMI accident, GPU management has periodically considered selling the uranium that was not pledged to support the Revolving Credit Agreement. During this period there was strong evidence that the market was likely to soften and prices decrease:

- A large number of nuclear plants on order had been cancelled.

- The TMI accident had caused great uncertainty over the future of the nuclear industry.

- Large increases in worldwide uranium mining capacity had been or were in the process of being installed.

- The Tennessee Valley Authority broke a major uranium supply contract because of its excessive price.

The potentially saleable inventories probably decreased by $8 per pound in value between December 1979 and July 1980 since the market price of uranium oxide decreased from $40 per pound to $32 per pound during that period. Such a decrease represents almost $11 million in potential cash realization. In spite of the evidence of likely price declines, GPU did not elect to try to sell the uranium until the Spring of 1980. It was the judgment of management during this period that attempting to sell the uranium might result in unacceptably negative perceptions of GPU's viability by the financial community.

GPU's Coal Reserves

GPU has two major coal reserves. Penelec and Jersey Central jointly control the Reesdale coal reserves in Armstrong County, Pennsylvania. According to GPUSC fuels personnel, the Reesdale reserves contain approximately 40 million tons. Both deep and strip mineable, these reserves are largely owned by GPU; the remainder are controlled by lease. These reserves might net $7 to $8 million to GPU if they were sold. In addition, GPU has acquired control of approximately 40 million tons of coal in Central Pennsylvania as a result of a joint drilling program with R&P Coal Company. According to GPUSC fuels personnel, these reserves are controlled primarily via lease rather than ownership, and they are in noncontiguous blocks. These reserves might realize $4 million in an outright sale. The Penelec portion of the Reesdale reserves is attached by a mortgage. The status of the Jersey Central portion is unclear. GPU has not made any investment to develop mines in these reserves.

GPU explored the possibility of selling its coal reserves after the Three Mile Island incident, but little interest was shown by potential buyers at that time. It should be noted that the coal market has been very soft during the last year. It is possible, however, that current concerns over reliability of Middle East oil supplies may result in an acceleration of utility oil-to-coal conversions. This, in turn, might make these properties more marketable than they were last year.

Conversion of Combustion Turbines to Dual-Fire Natural Gas and Oil

Fuels personnel at Met-Ed and GPUSC have identified approximately 160 MW of Met-Ed combustion turbine capacity that could be converted to gas if a capital investment of about $2 million were made. These conversions could save over $4 million per year in fuel and interchange power costs, the latter resulting from a lowering of GPU's alternative generation cost used in the split savings pricing method. While the gas suppliers currently have gas available, they will not make a written commitment to guarantee supply. Due to this uncertainty, GPU has been reluctant to make the capital investment for conversion.

Such capital investment could readily be justified if the Company were to obtain (via a DOE ruling or a special law) a preferential allocation or curtailment priority of natural gas to meet all its conversion needs. While the success of an effort to obtain a preferential allocation or curtailment priority is far from certain, the Company may have ample bases to pursue it. It could for example, be requested to help ameliorate the economic impacts to GPU's ratepayers arising from the TMI accident.

TB&A's recommendation that GPU thoroughly explore the benefits and risks of converting its combustion turbines to gas was presented to the Company in January 1980. GPU had already performed some evaluation in this area, and has taken further steps to implement the conversion. To date the Company has:

- Identified the most promising locations for installation of dual oil/gas firing capability based on the risks of gas supply disruption and the payback period for required capital investments.

- Filed with the Economic Regulatory Administration of DOE a request for a temporary public interest exemption permitting the burning of natural gas at combustion turbine installations.

- Conducted negotiations with gas suppliers for service pending receipt of necessary regulatory approvals.

- Ordered long lead time items for metering and hook up of gas service and installation of dual fuel capability on the combustion turbines.

The Company, however, has not attempted to obtain a preferential allocation or curtailment priority of natural gas to meet all of its combustion turbine conversion needs. While such a priority would undoubtably be difficult to obtain it might form part of federal assistance package. It is estimated that lead times required to obtain necessary regulatory approvals will prevent the use of gas in the converted units before the spring or summer of 1981.

Fuel Cost Reduction and Procurement Efforts

There may be potential fuel cost reduction opportunities associated with the Conemaugh station, which is approximately one-sixth owned by Met-Ed. Approximately 80% of the coal for this station is supplied under contract from the Florence Mining Company. Florence derives this coal from its own mines and from market purchases. The coal mined by Florence is charged to the plant owners on an essentially cost plus basis. GPUSC personnel project that if the Conemaugh owners required the Florence Mining Company to close its #2 mine and substitute purchased coal for it, it could realize significant savings. GPU has been attempting to secure the agreement of the other owners necessary to achieve this change.

GPU has taken steps to eliminate the weaknesses in its fuel procurement operations that led to the Pennsylvania Commission requiring Met-Ed to refund $3.6 million of overcharges related to 1974 coal procurement. The Company has established formal materials management organizations at the operating companies and has staffed them with personnel who possess many years of professional procurement experience. These materials management organizations are responsible for fuel procurement. Furthermore, GPU has developed formal written purchasing procedures for fuels procurement. GPUSC fuels personnel prepare a comprehensive fuels report monthly. It presents in graphical form for each operating company and jointly-owned plant the cost (contract, spot and average), consumption and inventory position of each type of fossil fuel. Data are presented by month for the current and twelve previous months. The report is circulated to top management and to the materials management personnel of the service company and the operating companies. The report should provide warning of trends that may be indicative of problems in the fossil fuels area.

PURCHASED POWER

GPU has actively worked to reduce its very high expenditures for purchased power, which have averaged $37 million per month since the TMI accident. Efforts have been made to:

- Obtain approval for a more equitable pricing of PJM interchange power than the tradional split savings method

- Purchase short-term (week to week) firm power from utilities directly interconnected to GPU or from which power can be economically wheeled to GPU

- Purchase long-term firm power.

PJM Power Policy

Obtaining approval of a more equitable basis for PJM interchange pricing has been a slow process. GPU is of the opinion that FERC favors cost-based rather than split savings-based pricing of interchange power; however, the legal process for obtaining a change could take two or more years. GPU, therefore, has attempted to obtain agreement among PJM members on the somewhat less desirable cost plus 10% pricing basis in order to provide an incentive to net PJM sellers to reach a compromise agreement in lieu of a prolonged legal confrontation. The net PJM sellers are Pennsylvania Power & Light (PP&L), Baltimore Gas & Electric (BGE), and Potomac Electric Power Company (PEPCO). The Pennsylvania Commission has approved PP&L's agreement to cost plus 10% pricing. The Maryland and Virginia Commissions have not yet ruled on BGE's and PEPCO's request for approval of the agreement. The District of Columbia Commission has rejected PEPCO's request for approval of the agreement. In March 1980, GPU filed a formal request with FERC to institute cost basis pricing of PJM interchange power. Interim relief, with pricing subject to refund, has been requested in order to speed up the

process of implementing the change. On July 31, 1980, a tentative agreement was reached by the PJM members to a stipulation of cost plus 10% pricing subject to limits on hourly and annual quantities available on this basis. It is now being considered for final certification and approval by FERC and could be effective as early as September 1980.

Short-Term Power Purchases

Efforts to purchase short term lower cost power from neighboring utilities have yielded tangible benefits to date. As shown below, GPU estimates that through June 1980 these purchases saved over $114 million in costs relative to the costs of other available energy sources, such as PJM interchange power or GPU oil-fired units:

Company	GWH	Cost	Avoided Costs (Millions)
Penelec	1,915	$ 59,091	$21.9
Met-Ed	3,775	115,125	52.2
Jersey Central	3,616	115,492	41.2
Total	9,306	$289,708	$114.3

As advantageous as these purchases are, they have two significant drawbacks. To date GPU has not been able to obtain firm commitments of power at attractive prices for periods longer than one week. Although the recession may weaken electric demand in the Midwest during the coming year and although low cost coal-fired power will probably continue to be available on a week-to-week basis in the short term, there is no certainty that attractively priced power will continue to be available in the future. Second, the necessity of paying a wheeling charge to each system between the selling utility and GPU greatly limits the geographic area from which GPU can purchase power economically. As an example, GPU was recently offered 400 MW of oil-fired energy from Central Hudson, a neighboring utility with significant excess oil fired capacity, at 43.8 mils per KwH. GPU is currently purchasing 150 MW, which can be transmitted over a small direct line without wheeling charges and is therefore economic. The remaining 250 MW had to be declined because it would have had to be transmitted over Consolidated Edison and Public Service Electric & Gas lines. The two wheeling charges would have made the power economically unattractive.

Long-Term Firm Power

According to GPU, there appear to be only three possibilities for long-term purchase of non-oil-fired baseload energy that would not involve prohibitive wheeling costs. Pennsylvania Power & Light has offered GPU the opportunity to purchase power from its Susquehanna 1 and 2 nuclear units. Philadelphia Electric may possibly have excess capacity available from its Limerick 1 and 2 nuclear units in the late 1980's. Ontario-Hydro (OH) will

have over 1000 MW of coal-fired energy available on a firm commitment basis until 1994. The PP&L option would help meet the needs of GPU's Pennsylvania companies whereas the OH connection would provide JCP&L's power requirements in the absence of Forked River.

The long-term firm purchase of power from the PP&L Susquehanna nuclear units has been rejected by GPU. The capacity factor risk associated with firm purchases from specific nuclear plants was judged to be unacceptable given the loss of TMI nuclear capacity. As an alternative, GPU has proposed to purchase on a firm basis one-half of PP&L's excess generation. Since the purchase would be from PP&L's overall system capability rather than from specific nuclear units, the capacity factor risk was judged to be acceptable. To date, PP&L has not made a decision on GPU's proposal. Purchase of firm power from Philadelphia Electric's Limerick 1 and 2 nuclear units, should it become available, would result in a capacity factor risk similar to that associated with firm power purchases from PP&L's Susquehanna units. This potential purchase, therefore, has not been pursued.

Large volume purchases of Ontario-Hydro coal-fired energy would require the construction of a cable under Lake Erie between Ontario and Pennsylvania. The cost of this line would be shared equally by GPU and OH. GPU's latest estimates indicate that its share of the cost would be $275 million. This would have to be amortized over 9-3/4 years, the period between the line's projected in service date of 1985 and the end of OH's firm capacity commitment in September of 1994. This results in a yearly amortization of $80 million.

GPU estimates the overall benefits of the Lake Erie cable/Ontario-Hydro purchase vs. purchase of PJM interchange priced on a split savings basis to be significantly in excess of the other alternatives over the 9-3/4 years. GPU's amortization of the cable would reduce the benefit by $80 million per year. Furthermore, this project would be less costly to finance than an alternative source of coal-fired capacity; for example, a new Pennsylvania coal plant might cost in the neighborhood of $1 billion. On the other hand, a new coal-fired plant would provide firm capacity for up to 30 years vs. the 9-3/4 years provided by this project. If PP&L accepts GPU's proposal to purchase its systemwide excess capacity, GPU's Pennsylvania companies would derive little benefit from the Ontario-Hydro purchase.

The Ontario-Hydro project faces a major uncertainty that could influence its economic viability. The Canadian Federal Government could impose an energy export tax on the purchase which would consume much or all of the differential between the OH selling price and GPU's cost of alternative energy. The line would qualify as PJM installed capacity. The imposition of a tax may wipe out the energy savings, but the capacity would still benefit GPU relative to its PJM commitments. The possibility of such a tax is very real. The Canadian Federal Government has set energy export taxes on petroleum and natural gas. These taxes essentially result in charges to U.S. consumers which reflect world rather than Canadian prices for these energy commodities. GPU is currently attempting to negotiate with OH a

pricing formula which will reduce the financial risks to it associated with an energy export tax. The success of these negotiations is far from certain. The most significant factor will be the absolute magnitude of the tax imposed. A low tax may not affect the economics significantly.

PJM Membership

An issue related to purchased power is the appropriateness of the current GPU membership arrangements within PJM. All three operating companies are signatories to the agreement but their relations with PJM are handled centrally by GPU. GPU has not formally investigated the trade-offs involved in restructuring PJM membership so that full membership would be at the operating company rather than the GPU group level. GPU believes that there would be a significant financial disadvantage to full PJM membership at the operating company level, due to significant increases in personnel and other operating costs and loss of benefits under the GPU power pooling agreement such as the diversity between summer and winter load. As indicated previously, it appears that post TMI sales of power from Penelec (the principal seller) to Jersey Central have been primarily from Penelec's excess purchased power rather than from its own generation. The GPU membership arrangements within PJM, therefore, appear to be appropriate at the present. Should in the future Penelec and Met-Ed sell significant amounts of the power they generate to JCP&L, the appropriateness of these arrangements should be reevaluated.

LOAD MANAGEMENT AND CONSERVATION

GPU, with encouragement from the Pennsylvania Commission, has been pursuing load management and conservation opportunities since 1974. The Company estimates that by 1990 existing load management programs will reduce its system winter peak by 490 MW and its summer peak by 270 MW. In its rate order of June 19, 1979, the Pennsylvania Commission directed Metropolitan Edison and Pennsylvania Electric Company to submit for Commission approval conservation plans which reflected an aggressive, imaginative program of encouraging conservation in order to reduce purchased power costs. In its rate order of May 9, 1980, the Pennsylvania Commission stated that Met-Ed's costs must be reduced through load management and conservation-inducing rate structure changes, although the actual changes to the rate structure would be the subject of a future hearing.

In July 1980, GPU implemented a Peak Alert Program to pursue voluntary load reductions at times of high energy costs. Whenever the GPU running rate exceeds 100 mils per KWH and GPU is also purchasing interchange power, it issues appeals to residential, industrial and commercial customers to reduce their usage in order to minimize increases in their subsequent electric bills.

On March 28, 1980 GPU issued a report outlining a comprehensive Master Plan for Load Management and Conservation designed to reduce by half the expected system load growth between 1980 and 1990. This represents a net

reduction of 994 MW and 1333 MW in the expected summer and winter peaks respectively. As indicated in Exhibit IV-5, the Master Plan outlined a careful, phased approach and identified the general methods to be employed and the expected MW reductions to be achieved by each method. It did not, however, address the many implementation details necessary to carry it out. These will be addressed during the latter part of 1980. The Plan proposes a "Capacity Offset" approach, in which GPU will justify required capital investments if its costs are lower than the incremental costs of building new generation to meet the load deferred or eliminated by the Plan. As a corollary to the approach, GPU proposes making investments in load management equipment on its customers' premises, principally residences, and including such investments in its rate base. The Plan emphasizes the use of proven technology and approaches found successful by other utilities.

In addition to a reduction in summer and winter peak loads, the successful implementation of the Plan will change the GPU system from a winter summer leapfrogging system to an increasingly summer peaking system, thus reducing the GPU system's PJM reserve obligation from 25% to 22% of the summer peak load. This will further reduce GPU's PJM capacity obligation beyond the MW reductions realized directly from the Plan's implementation. Furthermore, there will be reductions in peaking purchased power and overall purchased power since achievement of the Plan's objectives will help to offset GPU's short capacity situation resulting from the TMI accident. Thus implementation of the Plan will reduce GPU's petroleum based energy costs (combustion turbines, PJM interchange power purchases) as well as defer or eliminate investments in new generation capacity.

The total present value savings from the Master Plan due to deferring or eliminating new generating capacity and reductions in energy costs is projected to be about $2 billion. The projections assume a Master Plan budget for GPU of about $580 million between 1980 and 1990, and a 13% discount rate. The latter is based on: assumed capitalization ratios of 53%, 12% and 35% for long term debt, preferred stock and common equity; and assumed average costs of 12.25%, 12.50% and 14.50% for long term debt, preferred stock and common equity. Should GPU's financial difficulties result in higher costs of capital, the discount rate will correspondingly increase, thus reducing the present value savings. On the other hand, continued financial difficulty will impair GPU's ability to build new generation capacity, thus increasing the necessity to reduce load growth.

The plan projects for Met-Ed and Penelec a total budget of $230 million for residential vs. $90 million for C&I load management and conservation programs, even though the Commercial and industrial (C&I) programs are projected to produce larger reductions in both winter peak (535 MW and 483 MW) and summer peak (400 MW vs 257 MW).

The Master Plan was developed on an overall GPU system rather than on a state-by-state basis. An analysis, therefore, was made to determine if the Plan gave GPU's Pennsylvania companies their proportionate share of the

program effort. Based on the analysis, the Pennsylvania companies represent 55 percent of the Master Plan program budget expenditures and 52 percent and 56 percent of the summer and winter peak load reductions respectively. Thus, the data indicates that the Master Plan has provided the Pennsylvania companies their proportionate share of the program effort.

The Master Plan calls for a three-phase program. Phase I - Securing Regulatory Approval - is scheduled to be completed by January 1981. Phase II - Initial Implementation - is scheduled to be completed by the end of 1983. This phase will involve demonstration of each major load management program in the Plan, and verification of the load reductions and cost effectiveness expected of each program. Phase III would be full-scale implementation of each program in the Plan found to be cost effective in Phase II. It is scheduled for the 1984 through 1990 time frame, and possioly beyond 1990.

As indicated previously, the March 28, 1980, Master Plan report did not address the many implementation details necessary to carry it out. GPU is in the process of formulating detailed implementation plans. The key implementation requirements of the Master Plan are as follows:

- Secure regulatory approval for capacity offset rate base treatment from Pennsylvania and New Jersey Commissions.

- Develop and secure approval of related rate design criteria.

- Establish procedures and reporting for review and monitoring by Commissions.

- Resolve organizational issues related to implementation.

- Develop customer load research data base and analytical techniques.

- Resolve potential legal matters including anti-trust aspects related to supplying load management equipment to residential customers.

- Develop load management marketing capability.

- Arrange for and manage logistics related to the residential load management program, including the supply, installation and maintenance of load management devices.

STRATEGIC RECOMMENDATIONS

The strategic recommendations for GPU in the energy area fall into five categories:

- Pursue the options identified in GPU's 1980 TMI 2 Major Commitment Review.

MASTER PLAN FOR
TARGET LOAD REDUCTIONS IN 1990
(Megawatts)

	Winter	Summer
Residential:		
Time of Day Rates	37	49
Storage Space Heat	476	-
Storage Water Heat	208	208
Weatherization/Audits	104	256
Subtotal	825	513
Commercial and Industrial:		
Time of Day Rates/Customer Contact Program:		
General	464	420
Cooling/Heating Storage	100	53
Heat Recovery	204	48
Curtailable Rates	100	100
Cogeneration	130	130
Subtotal	998	751
Master Plan Total	1,823	1,264
Existing Load Management Programs	-490	-270
Net effect of the Master Plan on 1980 Forecast	1,333	994

- Aggressively upgrade the performance (plant availability and output) of existing power plants.

- Improve fuel-related strategic performance.

- Aggressively pursue load management, conservation and cogeneration efforts.

- Expand and pursue The "Pennsylvania Solution" options.

These recommendations are not mutually exclusive, and two or more can be pursued to advantage. For example, GPU's analysis of the TMI 2 Major Commitment Review options is based on the need for additional capacity even if the load reduction targets in the Master Plan for load management and conservation are achieved. The recommendations will in most cases require significant capital investments over and above capital required for system maintenance and reliability. In view of GPU's severe financial problems, the relative benefits of each recommendation will need to be weighed against the availability of capital since while all of them should improve GPU's long-term situation they require short-term funding.

1980 TMI 2 MAJOR COMMITMENT REVIEW OPTIONS

This review examined four approaches to meeting GPU's projected future electric demand: restore TMI 2 and build a 472 MW coal-fired plant; convert TMI 2 to a 1352 MW coal-fired plant; convert TMI 2 to a 1375 MW gas-fired plant, run for five years, and then convert to a 1352 MW coal-fired plant; replace TMI 2 with two offsite coal plants totalling 1352 MW. GPU estimates that restoring TMI 2 is by far the most economic option and that conversion would be slightly more economic than the entirely new coal-fired option, as shown in the table below.

Option	Net Capital Cost (Millions)	Average Cost per/KWH 1984-1996	Average 1984-1996 Monthly Cost Penalty	
			Met-Ed	Penelec
1. Restore Plus Coal	$ 745	7.60¢	-	-
2. Convert - Gas/Coal	1658	10.60	$4.23	$1.58
3. Convert - Coal	1377	11.15	5.04	1.89
4. Replace-Offsite Coal	1846	11.25	5.19	1.94

The least expensive option is, overall, the riskiest. GPU estimates that the first option (restore TMI 2) could incur an overrun of more that $1 billion before its average cost of electricity equals that of the second least expensive option (convert TMI 2 to gas/coal). The first option is estimated to require between $600 million and $1.1 billion less in net capital cost than the other options. The attractiveness of these numbers,

however, must be balanced against the short-and long-term risks. GPU assumes that the NRC's decision on approval/disapproval for TMI 1 operation during 1981 will provide a signal as to whether the TMI 2 restore option can be pursued. Such a signal, however, could be delayed or misleading:

- Because of the many political and psychological factors, the decision on TMI 1 may drag on well beyond 1981. As indicated in TB&A's March 1980 testimony, there is a strong probability that the restart of TMI 1 will be delayed significantly beyond the scheduled date of January 1, 1981. In fact, it may never be clear whether the NRC will approve or disapprove operation. The danger exists, therefore, that GPU will lose valuable lead time in pursuing other alternatives.

- TMI 1 could be approved for operation in 1981, but subsequent events might make it impossible to restore TMI 2.

The TMI 2 conversion options may have some capital investment and economic advantages over the option of building new coal-fired replacement capacity offsite. However, the risks of the conversion outweigh the benefits. There could be reliability problems since a conversion of the magnitude involved would be unprecedented. Furthermore, financing difficulties might prevent the conversion, but still allow one of the two offsite coal plants to be built. The conversion could not be practically subdivided to ease potential cash flow problems. Finally, the conversion option exposes GPU to the risk that the converted plant may become inoperable should public pressures result in the TMI 1 plant being put out of operation again in the future.

The 1980 Major Commitment Review recommends: commiting to the TMI 2 restore option; redirecting GPU's resources, to the extent possible, to building offsite coal plants to replace TMI 2 should either TMI 1 not be allowed to restart or restoring TMI 2 is found to be impractical. While the thrust of the recommendations is reasonable, they do not go far enough. Specifically, they do not include initiatives for: attempting to speed up the licensing and building of new coal-fired plants; obtaining federal assistance for demonstration plants of innovative coal-related technology; and developing rate incentives which accelerate load management and conservation. The success of these initiatives is far from certain, however, they can provide an essential margin of safety should the TMI 2 restore option become infeasible. Furthermore, their pursuit will require a small fraction of the cost of starting to build coal-fired capacity or converting TMI 2. Given GPU's severe financing constraints, it is probably limited in its ability to track more than one option. Pursuit of these initiatives therefore, is probably the only way GPU can acquire a margin of safety. It should be noted in this regard that Penelec is continuing its licensing and engineering support efforts related to Seward 7 and Conemaugh even though a final decision to build them has not been reached. This is appropriate since GPU will not lose time in building these plants should they be needed as an alternative to the TMI 2 restore option.

PLANT AVAILABILITY AND OUTPUT

Improved plant performance can significantly reduce GPU's purchased power requirements and hence costs of electricity. These improvements, while requiring a major effort from the company, are, in our opinion, achievable. Achieving them, however, will require:

- A high priority effort on the part of the Company
- Significant capital investment
- Close monitoring of progress by the Commission
- Possibly a strong set of rate-related incentives and penalties.

Some of the expenditures for capital investments and improved maintenance will have to be made one or more years prior to the achievement of improved results. Furthermore, improvements may require increases in scheduled outages (maintenance) which will decrease availability and output in the near term. To ensure that short-term budgetary and cash flow considerations do not endanger the success of the plant improvement programs, GPU should investigate the potential feasibility of:

- Fuel and energy adjustment clauses that specify targets for plant performance indicators. The targets would span several years but would specify annual performance levels based on realistic engineering estimates of improvement potential and required lead times. GPU would participate in developing the targets, and they would be implemented if GPU approved them as being achievable. The Pennsylvania Commission is currently exploring innovative incentive fuel and energy adjustment clauses.

- Developing the budgets necessary to achieve the targeted plant performance improvements. These budgets would also indicate the required increases, if any, in scheduled maintenance. These budgets would be given a high priority for funding when rates are set. Possibly, they would be added to test year expenses or funded through the energy adjustment clause.

- Developing reporting and auditing procedures so that the Commission can verify that the company is effectively pursuing the plant performance objectives and is reporting performance indicators correctly.

In addition to pursuing the aforementioned incentive programs, GPU should continue and expand its efforts to make operational improvements to its plants through:

- Tracking and identifying trends in plant performance indicators

- Implementing a comprehensive planned maintenance program

- Instituting engineering analysis of equipment history files

- Establishing a complete vibration and infrared analysis program
- Tightening control procedures on planned outages
- Identifying methods for upgrading plant equipment
- Developing continuous operator training program
- Posting and widely disseminating performance trend information:
- Establishing a comprehensive program of testing and analyzing specific pieces of equipment
- Establishing performance improvement goals

The performance trends indicate that the Pennsylvania companies improved the performance of their generating stations in 1979 and may do so again in 1980. Nevertheless, there is room for additional improvement. This improvement will be reflected as fewer MWH's lost to forced and planned outages, lower heat rates, and lower costs for maintenance overtime and the use of contractors. Better performance in each of these areas can be quantified. Exhibit IV-6 presents an estimate of the annual savings that would result from reducing the forced outage rate for each plant from the 1979 level to the lowest level achieved during the past five years. Similar analyses can be made of the other performance indicators to show the potential dollar benefits of improvement in these areas. Improvement in plant performance presents one of the best short-term alternatives for increasing net generation and thereby decreasing GPU's need to purchase power.

ENERGY OPTIONS STRATEGIC PLAN

GPU should develop a formal energy options strategic plan. This plan, which should be developed annually for review by top management, should include: an assessment of relevant regulatory, government policy, and fuels market factors; the strategic initiatives that are contemplated in response to the problems and opportunities represented by these factors; and the risks and uncertainties involved in implementing these initiatives. The plan should be updated informally and presented to top management at least semi-annually.

This will help improve the Company's energy related strategic performance in several ways. It will focus top management attention on the consideration of high payout but risky initiatives that might otherwise have been prematurely rejected at a lower level in the organization. The plan can also provide valuable input for the Company's annual presentation to the Pennsylvania Commission. It can help bring to the Commission's attention as soon as possible those state and federal regulatory and policy issues that will have the greatest benefit for Pennsylvania ratepayers should they be resolved in a satisfactory fashion.

POTENTIAL SAVINGS FROM REDUCED FORCED OUTAGE RATES

Plant	MWH Lost In 1979	MWH Loss Target	Difference	Potential[c] Savings (Millions)
Homer City 1 & 2[a]	3,750,000	3,500,000	125,000	$ 1.25
Conemaugh[b]	5,700,000	4,000,000	283,333	2.83
Shawville	820,000	640,000	180,000	1.80
Seward	125,000	125,000	-	-
Portland	1,400,000	700,000	700,000	7.00
Titus	200,000	175,000	25,000	0.25
Front St.	98,000	65,000	33,000	0.33
Total	12,093,000	9,205,000	1,346,333	$13.46

(a) 50% owned by Penelec
(b) 16.45% owned by Met-Ed
(c) These figures are gross potential savings and do not reflect the capital investment requirements required to achieve them.

GPU recently considered instituting a planning procedure similar to the recommended energy options strategic plan. However, competing and higher priority demands on management's time resulting from the TMI accident apparently prevented its complete implementation.

LOAD MANAGEMENT, CONSERVATION AND COGENERATION

If the Pennsylvania Master Plan MW reductions for 1980-1990 are realized, Seward 7 could be deferred beyond 1990 (assuming TMI 1 and 2 resume operation). Furthermore, GPU's most recent efforts to develop cogeneration applications have uncovered significantly greater potential than was anticipated when the Master Plan was developed.

Thus, GPU should target a crash program toward large industrial and commercial customers since they represent the best combination of short lead time load reduction potential and minimum required expenditures of GPU funds. GPU has already taken steps in this direction. Furthermore, priority should be given to developing the load reduction potential in cogeneration, mandatory super insulation standards, and commercial and industrial heat storage and heat recovery applications as these offer an attractive combination of probably high load reduction and minimum expenditure of GPU funds. GPU should also explore possibilities for innovative financing or end user purchase of load management equipment to reduce the need for its investment in such equipment.

A priority effort should be directed toward developing the load research data base and analytic tools necessary to provide management control of the program. Go/No-Go milestones should be established for the residential load management program since the combination of large expenditures and uncertainty of results make it the area of greatest potential risk in the Master Plan. Both the Company and Commission should carefully monitor progress against these milestones. Given the large expenditures required by the Master Plan and its large benefits if implemented successfully, GPU should develop an approach for increased communication, coordination and joint planning with the Commission regarding load management and conservation.

To give proper focus to load management and conservation, the program should initially be centralized in one organization. The Master Plan involves a high degree of uncertainty. If it is not centralized in one organization, there is a strong possibility that it will not compete successfully for management time and effort. In addition, it will be necessary to upgrade GPU's marketing expertise and develop a comprehensive load management and conservation marketing plan. The elimination of promotional efforts in recent years had eroded this capability.

The following steps should be taken to achieve or exceed the Master Plan goals.

- The Pennsylvania Commission should seek DOE support, under the PURPA Innovative Rates program, for the development of rate structures which will help to win public acceptance of the Master Plan programs. These innovative rates should seek to provide the maximum economic incentive for customer load management, conservation and cogeneration consistent with GPU's financial requirements and applicable legal considerations. Subsequent to a TB&A suggestion, GPU and the Commission staff developed a coordinated effort whereby the Commission filed an application with the DOE for $500,000 official 1981 funding of such a program with GPU's Pennsylvania companies serving as the pilot utilities. If approved by DOE, the program would be completed over a two year time period.

- GPU should lobby with DOE and FERC to obtain a ruling which would give industrial gas users who cogenerate a higher gas curtailment priority than non-cogenerating industrial gas users. To the extent feasible, the Commission should provide incentives for use of gas in cogeneration applications.

- GPU should lobby with state and federal agencies for air quality regulations that would not discourage coal-fired industrial cogeneration. Perhaps, the recent EPA "Bubble Concept" of setting overall emission limits for multi-emitting source industrial sites might be interpreted to provide imputed emission credits to cogenerators based on the higher energy efficiency of cogeneration.

THE "PENNSYLVANIA SOLUTION"

The term "Pennsyvlania Solution" refers to intiatives sponsored by Pennsylvania regulatory authorities to develop a state-wide approach to utilization of the energy resources of Pennsylvania, including generating facilities. Under the "Pennsylvania Solution", Met-Ed and Penelec might be considered for generation purposes as a stand-alone Pennsylvania company rather than as members of an interstate system. In this regard several points are noted.

- Even with both TMI units out of service, the Pennsylvania GPU companies are closer to self-sufficiency than the GPU system as a whole, but they are still in a precarious position. For example, Penelec/Met-Ed's combined reserve factor (their ability to meet their peak annual load with their own capacity) without TMI is -2.9% while for the GPU system it is +6.2%.

- If the TMI units are restored to service in 1981 and 1986, the Pennsylvania companies can meet their generation capacity requirements entirely through the peak load reductions targeted in the Master Plan for Load Management and Conservation.

- Pennsylvania has greater resources available to help ameliorate the impact of the TMI accident upon ratepayers than does New Jersey. For example, Pennsylvania Power & Light has significant excess capacity and GPU has proposed purchasing this capacity on a PP&L system wide rather that plant-specific basis. In addition, Pennsylvania's current air quality situation allows the operation of coal-fired power plants. Because New Jersey's does not, GPU's most expensive source of base load power are its New Jersey oil-fired plants.

GPU should continue its efforts to purchase PP&L capacity on a system-wide rather than plant-specific basis. GPU should also explore other initiatives to lower the costs of energy to its Pennsylvania rate payers. The large reserves of Pennsylvania coal, coupled with the urgent national need to displace oil in electric generation, might provide the foundation for one such initiative. GPU should consider advocating the establishment of a Pennsylvania Energy Development Authority to operate federally assisted demonstration plants for innovative coal generation technology. Such demonstration plants might include: coal cleaning electric cogeneration systems; coal liquification/gasification electric cogeneration systems; atmospheric fluid bed and fluid bed combined cycle electric generation systems. Because of federal financial assistance which might include grants and/or loan guarantees, a Pennsylvania Energy Development Authority might be able to build electric generation capacity less expensively than GPU. Furthermore, by meeting the generation requirements resulting from Met-Ed's and Penelec's load growth, such an authority might reduce GPU's long-term capital requirements for financing new plant construction.

Conceptually, the establishment of a federally-assisted Pennsylvania Energy Development Authority might be similar to the establishment of the Power Authority of New York (PASNY). In the case of PASNY, the availability of a large national energy resource (Niagara Falls and St. Lawrence Seaway hydro-electric potential) provided the basis for establishing a public power agency which provides electricity to local ratepayers at favorable rates. Given the urgent need to displace oil in electric generation with coal in an environmentally acceptable manner, the Pennsylvania coal reserves might be viewed as a national resource similar to Niagara or the St. Lawrence hydroelectric potential.

In addition to reducing the degree of rate relief needed by Penelec and Met-Ed, a Pennsylvania Energy Development Authority based on federally assisted advanced coal technology demonstration plants might provide another benefit. Perhaps the banks participating in the Revolving Credit Agreement could be offered preferential participation in federally guaranteed loans for innovative coal demonstration plants as an inducement for their continued support of the Revolving Credit Agreement.

This initiative is innovative and subject to great uncertainties. However, during the last decade two investor-owned utilities with serious problems in financing the construction of generation facilities developed innovative solutions involving public power agencies. Consoliated Edison

sold two power plants under construction to the Power Authority of the State of New York and transferred its public agency load to this authority. In a similar situation, Georgia Power sold a major interest in two coal fired plants under construction to a new generation and transmission cooperative, Oglethorpe Power Corporation. A loan guaranteed by the Rural Electrification Administration provided a substantial portion of the purchase financing.

The May 1980 Staff Draft of "Pennsylvania Energy Choices" prepared by the Governor's Energy Council was reviewed to determine if this potential initiative was consistent with the recommendations of the Council. It was not proposed in "Pennsylvania Energy Choices"; however, it appears to be consistent with the thrust of that document. Specifically, in its discussion on cogeneration the Council noted that if national estimates (of cogeneration potential) can be scaled down to determine Pennsylvania's potential, cogeneration would have the "technical" potential of providing 20 to 40 percent of projected electric sales and 10 to 21 percent of planned electrical generating capacity for 1985. Furthermore, the potential initiative is consistent with the spirit of several recommendations presented in the Action Agenda of the draft report. In its discussion of the last recommendation listed, the Council said "The Commonwealth has vast coal resources which could be utilized for coal gasification projects. The use of methane resources from coal seams could also increase Pennsylvania's available natural gas supplies. The state should support the development of new and existing technologies to enable us to make use of our coal resources as supplemental gas supplies."

V. NUCLEAR ISSUES

BACKGROUND

The General Public Utilities System has an installed generating capacity of 8,262 megawatts, of which 28 percent is nuclear generation. The three nuclear generating stations are:

Station	Capacity (megawatts)	Commercial Operation Date
Oyster Creek	650	1969
Three Mile Island 1	800	1974
Three Mile Island 2	900	1978

The two nuclear units at Three Mile Island, which represent approximately 20 percent of GPU's generating capacity, are located on a small island in the Susquehanna River about 10 miles south of Harrisburg, Pennsylvania. The station is jointly owned by GPU's three operating companies, and is operated by Metropolitan Edison.

From start-up until the time of the accident, TMI 1 had a capacity factor of 76 percent, which is well above the national average for nuclear-fueled electric generating plants. As of June 1980, TMI 1 still had a better availability factor than many other operating nuclear plants in the United States even though it had not been operating for more than a year. As a result of the damage caused to TMI 2 by the accident and the subsequent order to shutdown TMI 1, 1,700 of the 8,262 megawatts of installed capacity was no longer available to the GPU System. This has substantially affected the generation mix of the GPU System. In 1978, nuclear generation was 34 percent of the generation mix, exclusive of purchased power, while in 1979 nuclear generation was 25 percent of the total. Oyster Creek, the only nuclear plant currently operated by GPU, represents less than 8 percent of installed generating capacity. Since nuclear-generated electricity is substantially less costly than coal and especially oil or gas fired generation, one financial ramification of the accident was the economic impact on GPU's ratepayers of replacing TMI's 1,700 megawatts of capacity with power either generated by more expensive sources of generation or purchased at substantially higher costs. The financial and purchased power implications of the accident were addressed in previous sections of this report.

HIGHLIGHTS OF TB&A TESTIMONY

Four key findings and conclusions related to nuclear issues were contained in TB&A's March 1980 testimony before the Pennsylvania Public Utility Commission:

- TMI 2 appears to be in a relatively stable state, but requires continuous management and operator attention to maintain this stable state.

- Because of the many uncertainties surrounding the damage and status of TMI 2, the Company should decontaminate and defuel TMI 2 as expeditiously as possible to assure the health and safety of the public.

- No one has a contingency plan to maintain the safety of TMI 2 and proceed with its clean-up in the event that GPU can no longer do so.

- There is no precedent for the hearing on the restart of TMI 1; therefore, many uncertainties could further delay the hearing process on TMI 1 which would delay the restart of the unit beyond the then scheduled January 1, 1981 restart date.

DEVELOPMENTS SINCE THE ACCIDENT

The accident at Three Mile Island placed unprecedented management and technical demands on GPU. GPU found itself in a reactive mode of operation immediately following the accident. A great number of decisions had to be made, based on a limited amount of available information, and with insufficient time to analyze all considerations thoroughly. The issue of large quantities of radioactive wastes had to be immediately addressed, and at the same time steps taken to begin planning for the clean-up of TMI 2 and the restart of TMI 1. The "lessons learned" from the accident have rippled throughout the industry -- various modifications have been ordered for such areas as hardware, training, emergency planning and public information.

Numerous external studies have focused on the various environmental, technical, socio-political, and other aspects of the actions that were taken preceding, during, and after the accident. The initial studies performed immediately following the accident indicated that recovery activities would cost $400 million over approximately 48 months. There were numerous uncertainties and caveats associated with these estimates because they were based upon limited information about the status of the unit as of June 1979 and "reasonable" expectations regarding the regulatory and political environment that would exist in the post accident time period. The recent experience of the Company with various governmental and regulatory agencies proved that the recovery cost and timeframe estimates were overly optimistic. A recent example of the cumbersome decision-making process is illustrated by the Krypton venting decision. Although venting of Krypton

from the containment was carried out within release levels below those currently permitted by other operating nuclear plants, permission to perform this venting took approximately one year to obtain. The Company evaluated numerous alternatives to venting and submitted a lengthy report to the NRC in November 1979. The venting option proposed was well within existing regulations. The NRC did not approve the venting plan until May 1980 and only after:

- Public hearings were held;
- The Union of Concerned Scientists and the National Committee on Radiation Protection (NCRP) stated that the release would cause no undue health risk to the public; and
- The Governor of Pennsylvania publicly backed the venting proposal.

Although all of the above were undoubtedly necessary to assure the safe cleanup of TMI 2, as a result of these and other factors, gaining full access to the containment in April 1980, as was forecasted in the original recovery plan, will be delayed until the middle of 1981. The overall schedule for cleanup of the unit has been lengthened and the overall costs have increased as a result. The "visibility" of the accident has resulted in complex regulatory and political issues which could conceivably constrain GPU's ability to clean-up TMI 2 and restart TMI 1 more than any of the technical issues involved. As a result of these factors, many of the restrictions placed on GPU are more stringent than those faced by other utilities with operating nuclear plants. As noted in TB&A testimony, the clean-up and restart efforts will require that specific actions be taken promptly by all parties involved --- principally GPU, the Pennsylvania Public Utility Commission, the Nuclear Regulatory Commission, other state and federal agencies, and intervenors -- in order to ensure the timely and safe clean-up and restart of the units at a minimum cost to the ratepayers of Pennsylvania.

The above factors, exacerbated by the state of the overall economy, primarily inflation and interest rates, complicate GPU's efforts to clean-up TMI 2 and restart TMI 1. GPU will continue to be the "goldfish bowl" of the nuclear industry for some time into the future.

GPU ACTIONS

These complicating factors notwithstanding, GPU has taken numerous steps to begin the clean-up and restart processes. Among GPU's accomplishments are the following:

- The Company has performed various planning studies for the recovery effort and facilities are currently being designed and constructed to facilitate clean-up activities.

- Approximately 400,000 gallons of lower level radioactive waste water have been processed by the Epicor II system. A submerged demineralizer system is being procured to process 800,000 gallons of the higher activity waste water. (NRC approval or disapproval of the demineralizer system will be the next major milestone in the regulatory/political environment of GPU.)

- The Company has continued to keep open the options for the disposal of low level radioactive waste.

- A restart program has been developed for TMI 1. Modifications are being made to the unit to permit the restart to proceed as quickly as possible.

- Permission to vent the Krypton from the containment was obtained and venting is now completed.

- GPU has retained Bechtel to begin the clean-up of the TMI 2 containment building

- GPU has signed a site-wide labor agreement with the crafts to facilitate the safe and expeditious clean-up and recovery of TMI 2.

- GPU has made numerous changes in key management positions to bring to bear the necessary management and technical skills on the TMI units.

KEY ISSUE ANALYSIS

The review of GPU's nuclear operations was structured to analyze several of the key management areas associated with the clean-up and restart efforts at Three Mile Island. The areas reviewed were:

- Organization - The existing organization at TMI and the organization planning currently being undertaken for the GPU Nuclear Corporation were reviewed relative to organizational responsibilities, mission and functions, and staffing.

- Major Contractors/Contract Administration - GPU's use and administration of contractors were assessed.

- Project Management System - Current and contemplated management systems for planning, scheduling, estimating and reporting progress on the clean-up and restart efforts were assessed.

- Construction/Cleanup Management - The "hands on" utilization of the work force at TMI was analyzed, as were the steps that are being taken to monitor and improve productivity and minimize overall costs (where safety considerations will permit).

- Support Functions - Support functions, including licensing, radiological controls, materials management and quality assurance, were investigated.

ORGANIZATION

The organization of the engineering, construction and operations activities at Three Mile Island has changed substantially since the accident. Prior to the accident, responsibility for the operation of the units was contained within the Metropolitan Edison organization. Engineering and construction (design and build responsibility) activities associated with the units were primarily the responsibility of the Generation organization located within the GPU Service Corporation, as illustrated in Exhibit V-1. During 1977, GPU's top management began studying possible alternative organizations which would provide:

- Sufficient in-house capability to adequately develop "base line" engineering for new stations.

- A closer coupling between in-house engineering and plant operations.

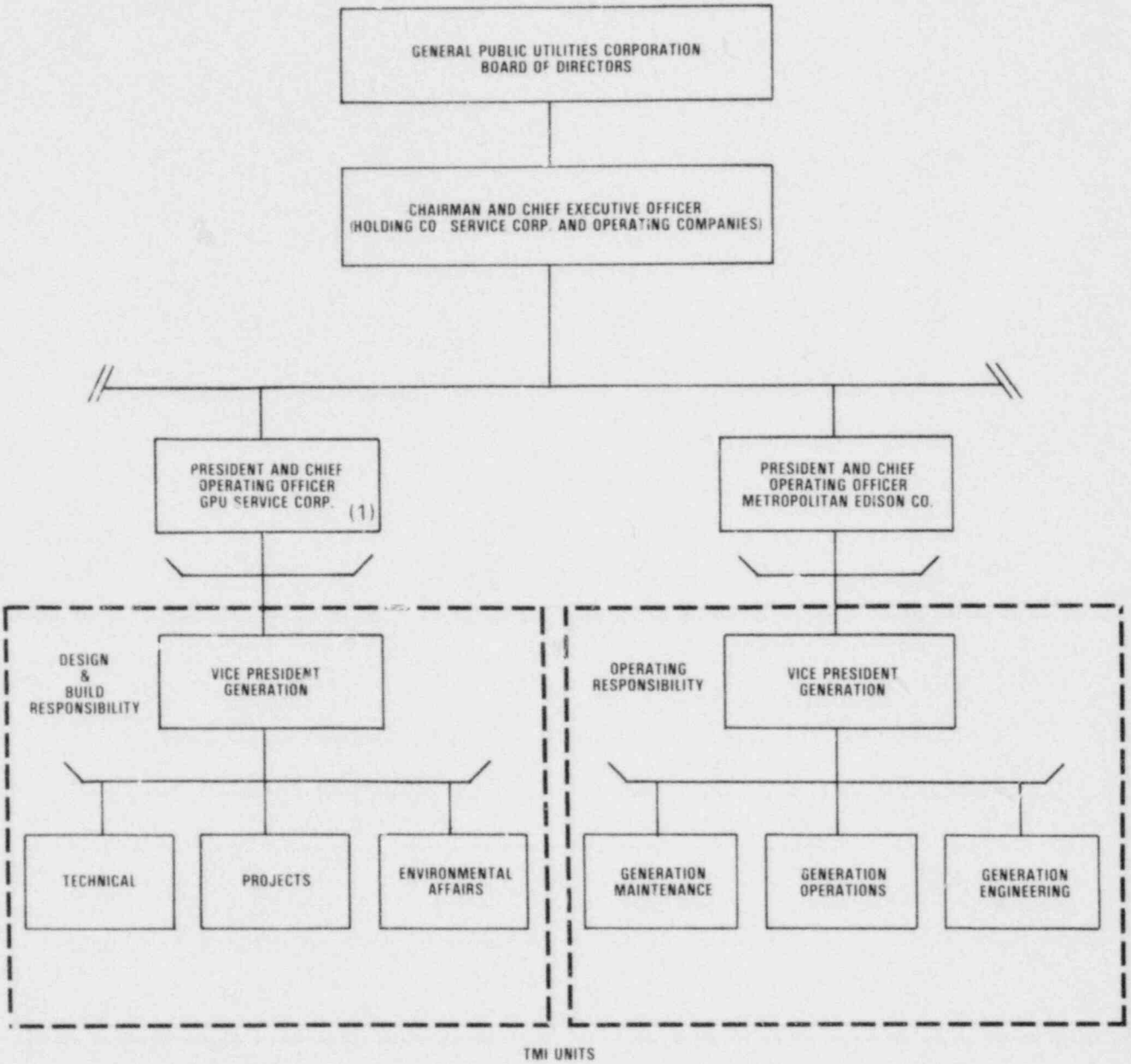
Various studies were performed during the 1976-78 period by both GPU personnel and outside consultants to formulate possible organizational alternatives that would address the above objectives.

TMI Generation Group

The accident at TMI resulted in an unprecedented technical effort by both the GPU and Met-Ed generation organizations. The competition for in-house technical resources to support these efforts resulted in the formation of a separate organization, called the TMI Generation Group, on July 30, 1979. This organization was formed by consolidating management and technical personnel from the generation departments of GPUSC and Met-Ed in one organization to address operating, engineering and construction activities associated with the restart of TMI 1 and the clean-up of TMI 2. The TMI Generation Group has undergone numerous organization changes since its inception. At the time of TB&A's review, it was organized as shown on Exhibit V-2. This reorganization has dictated the need to find appropriate management personnel to assume responsibilities for the functional areas shown on the exhibit. The senior management of TMI, which prior to the accident was totally staffed by Met-Ed personnel, is now staffed primarily by people brought in from the Service Company (GPUSC) or hired from the outside.

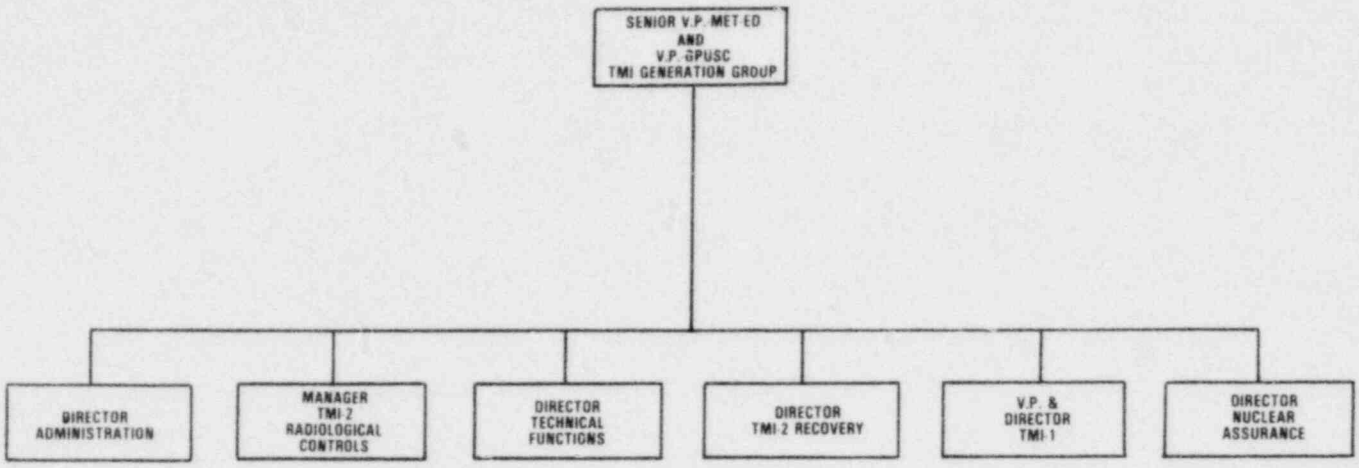
The TMI Generation Group was an interim organization. The GPU Nuclear Corporation was originally envisioned to be in place by June 1, 1980. GPU Nuclear Corporation will be a separate company whose primary responsibility will be the operation of existing nuclear facilities, engineering and construction of modifications and improvements to these facilities, and, perhaps at some future date, the engineering and construction of new nuclear

THREE MILE ISLAND ORGANIZATION
PRIOR TO MARCH 28, 1979



(1) Service Corporation also provides staff and oversight functions to operating companies

ORGANIZATION OF THE TMI GENERATION GROUP



facilities. This organization will be assimilated into the GPU group of operating companies as shown on Exhibit V-3. The contemplated organization of GPU Nuclear Corporation, as shown on Exhibit V-4 is an evolution from the TMI Generation organization. In September 1980, GPU announced the formation of the GPU Nuclear Group which is a further evolutionary step towards the GPU Nuclear Corporation. It permits the structure shown in Exhibit V-4 to operate pending full regulatory approval of the new corporation.

GPU Nuclear Corporation

The overall concept of the nuclear organization is appropriate, but its roles and functions have not been fully documented. Various studies conducted prior to the accident had indicated that some organizational changes would be necessary to adequately manage the operation, maintenance, engineering and construction of nuclear facilities. The accident accelerated the formation of a new organization to manage the activities associated with Three Mile Island.

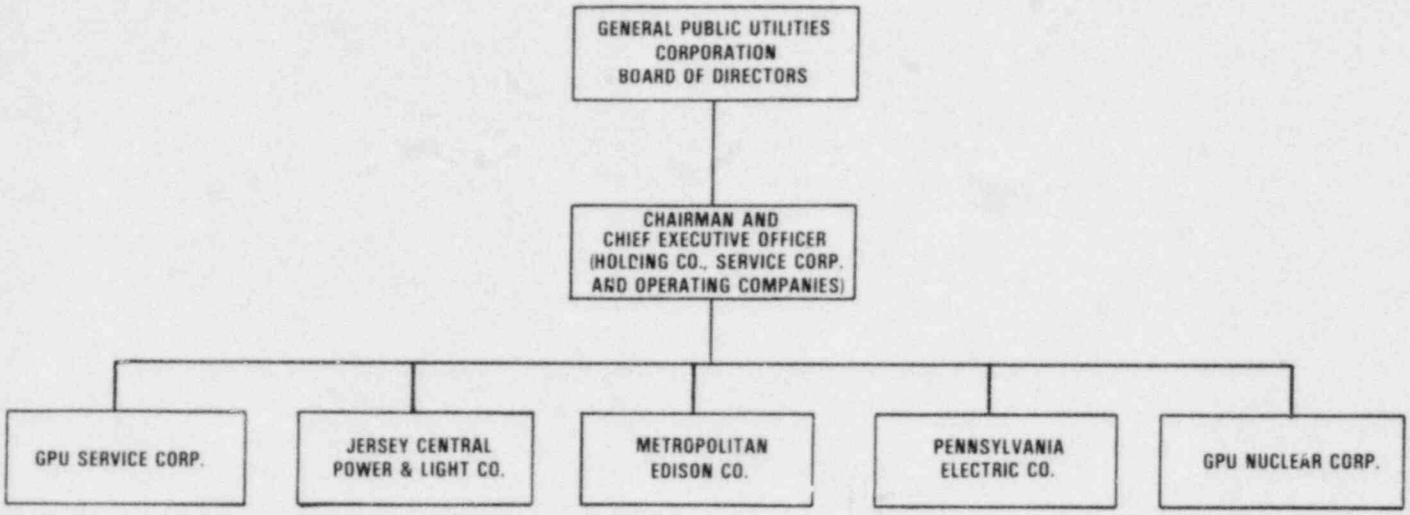
Other utilities are investigating or implementing somewhat similar nuclear organizations. The NRC draft criteria on management and organization for nuclear plants are also providing an impetus to develop corporation separate nuclear organizations. A formal evaluation of the GPU Nuclear organization will be a part of the Atomic Safety and Licensing Board (ASLB) hearings, which are scheduled to begin in October 1980.

The concept of the nuclear organization concentrates all the major activities associated with TMI under one organizational entity. Some of the benefits of such a nuclear organization are:

- Improved upper management visibility of nuclear activities
- A greater depth and breadth of specialized technical skills
- Improved communications with outside agencies
- An ability to attract better people
- Full-time dedication of the organization to safe operation.

The speed at which the nuclear organization was developed and the current state of flux that exists as the Company moves to create the GPU Nuclear Corporation have not permitted the complete documentation of well defined roles and functions. To provide assurance that individual talents are used effectively, that redundancies and duplications of effort are avoided, and that lines of responsibility and organizational interfaces are clearly understood, the details of the organization must be clearly defined and documented.

FUTURE OVERALL GPU ORGANIZATION



Staff Levels

Although some operational efficiencies may be achieved by the reorganization, the number of personnel required for nuclear activities will increase. Prior to the accident, the Company estimates that approximately 1,000 GPU personnel were associated with all nuclear activities. Additionally, approximately 200 contractors (such as guards, and technical personnel on secunding agreements) were engaged in support of nuclear activities, resulting in a total resource commitment of slightly more than 1,200 people. By early 1980, the number of people involved with nuclear activities approached 1,500, and it is highly likely that this number could exceed 1,800 by 1981. This would result in an increase of approximately 450 full time company personnel over the previous manpower commitment to nuclear activities. It is expected that the reorganization will minimize duplications between the operating companies and GPUSC in the engineering, licensing, construction, and quality assurance areas.

Although some of this increase in personnel is expected as a result of the recovery effort, a significant portion of this increase will probably continue even after both units are again operational. The accident and subsequent NRC actions will have the long term effect of increasing the need for higher levels of manpower to adequately and safely operate and maintain nuclear generating facilities throughout the country.

Various legal regulatory hurdles must be addressed prior to the formation of GPU Nuclear Corporation. Legal cooperation and regulatory hurdles may dictate the rate at which GPU Nuclear can be formed. The operating license for the plant must be modified to reflect the delegation of operating responsibility. Furthermore, numerous other permits and licenses may have to be transferred prior to the formation of GPU Nuclear Corporation.

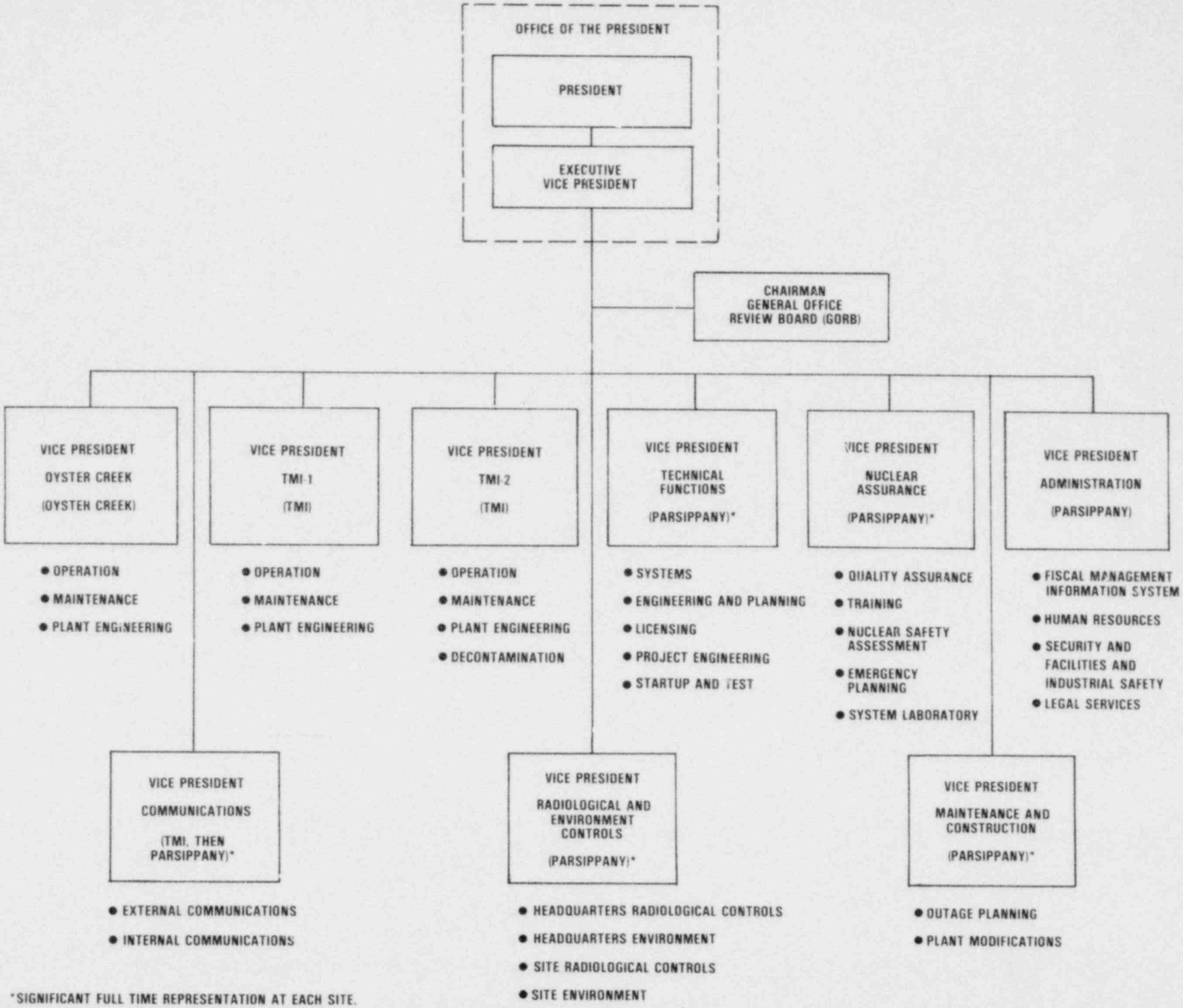
Public Relations

GPU's public relations efforts with respect to the TMI 2 cleanup need to be strengthened. Public relations activities are currently coordinated at GPUSC by a Vice President of Communications, and over the past year various personnel have been located at the island to improve the communications function. The emphasis to date has been primarily on dealing with the various news media and selected public officials. The information needs of the public are not being met by such a program.

A review of public meetings held in the local community revealed many areas where the Company could improve its public relations efforts. Examples of these improvements include:

- Placing greater emphasis on converting technical terms into a language the public understands, e.g., expressing curies in terms of x-ray dosages;

FUTURE GPU NUCLEAR CORPORATION



*SIGNIFICANT FULL TIME REPRESENTATION AT EACH SITE.

6/1/80

EXHIBIT V-4

- Properly focusing and structuring all public presentations to meet the needs of the audience involved and dispersing with unnecessary technical discussions;

- Providing public speaking and human relations training to all Company personnel who may appear before the public; and

- Providing a feedback mechanism to critique the effectiveness of these meetings.

The Company has taken several steps to improve its public relations efforts, such as sending Company personnel to public speaking and human relations courses. It is also anticipated that GPU Nuclear Corporation will have its own communications function headed by a professional communications manager.

MAJOR CONTRACTORS/CONTRACT ADMINISTRATION

Several external vendors are under contract to assist the TMI Generation Group in designing, engineering, licensing and constructing the modifications required prior to TMI 1 restart and in the clean-up activities on TMI 2. The major contractors are described below.

GPU has designated Gilbert Associates, Inc. (GAI) as the primary external architect/engineer to provide basic design engineering support on TMI 1. Major GAI responsibilties include: engineering and designing structures, systems, and components as requested by a GPU Project Engineering Manager; preparation of revised system design descriptions for modifications affecting major plant systems; and preparation of installation instructions and cable routing requirements for appropriate tasks.

Babcock & Wilcox Company (B&W) was the original vendor for the TMI Nuclear Steam Supply System (NSSS). Under the current contract, B&W is required to furnish engineering, safety analysis, licensing, startup and test, procedural development and training services necessary to assure the timely restart of TMI 1. B&W also performs generic safety analyses and design changes utilizing an NRC approved computer code. Litigation is pending between GPU and B&W on the original design and construction of TMI 1.

Catalytic, Inc. is the primary external construction contractor for the modifications to existing structures, systems, and components and for the installation of new structures, systems, and components required for the TMI 1 restart. Catalytic also serves as the primary maintenance contractor, providing support for preventive, repair and surveillance maintenance. Catalytic's primary responsibilities include performing field construction in accordance with the Work Authorization Notice for each task, assuring that materials and equipment are available for construction tasks, and preparing purchase requisitions.

Bechtel Corporation is responsible to GPU for the planning, engineering design, clean-up, procurement, and construction activities associated with the clean-up of the TMI 2 containment building. The planning and engineering required for the entry into the containment building, fuel removal and disposition, and decontamination require extensive professional time and highly proficient technical expertise. The Bechtel organization, which will report to the Manager of the Recovery Program, is being uniquely structured for this purpose. Exhibit V-5 illustrates the currently contemplated organization which Bechtel is in the process of implementing to manage the clean-up of the unit. The responsibility for conceptual planning and alternative planning scenarios will be the function of Bechtel's Nuclear Fuel Operations organization. Once the alternative plans have been developed and evaluated and the most appropriate plan chosen by GPU, the detailed work will be performed by Bechtel's Project Operations organization.

In addition to the four major contractors, numerous other contractors and vendors provide various technical, construction, and support services at TMI. These major contractors and vendors and the services provided by them are summarized on Exhibit V-6. GPU requires contractual agreements for vendors supplying equipment, labor, complex engineering or design services or consulting services. Standardized contract forms are used for labor, consulting agreements, technical services, vendor supplied equipment, construction services and leasing operations. Each contract itemizes performance minimum standards and highlights pertinent contract provisions.

Engineering and construction contractors for TMI 1 are utilized appropriately. The engineering and design support supplied by Gilbert Associates and Babcock & Wilcox is well managed by GPU. Individual tasks are assigned to the vendors when additional manpower is required, such as when the vendor can supply technical expertise not available in-house. Catalytic, Inc. supplies construction labor for TMI 1 modifications and continues to function as the maintenance contractor for both units. The labor forces are well utilized by both the construction and maintenance functions and between the nuclear units. This minimizes the costs associated with conducting Radiation Work Permit (RWP) training of craft workers by retraining them on the island between particular construction tasks.

Contract Policies And Contractor Selection

Standard contract policies are clearly defined, reasonable and flexible. Sealed bid procedures are used for orders exceeding $250,000. Written quotations are solicited in all other cases except in an emergency or when the item or service to be purchased is of a routine nature and is valued under $5,000. For routine items, such as materials, supplies or repair and maintenance, annual requirements are assessed and blanket commitments used with predetermined limitations. Negotiated or non-competitive awards are made only when there is a singularly qualified or economic supplier or for professional services. When a sole source of

BECHTEL ORGANIZATION FOR CLEAN-UP ACTIVITIES

BECHTEL PROJECT TECHNICAL SUPPORT
NUCLEAR FUEL OPERATIONS
SAN FRANCISCO, CALIFORNIA

PROJECT TECHNICAL ORGANIZATION

BECHTEL PROJECT MANAGER

FUNCTIONS

- PLANNING
- DEVELOPMENT OF ALTERNATIVES
- PRELIMINARY ENGINEERING
- EXTERNAL INTERFACES
- LICENSING SUPPORT

BECHTEL PROJECT OPERATIONS
BECHTEL NORTHERN
GAITHERSBURG, MARYLAND

PROJECT OPERATIONS ORGANIZATION

BECHTEL PROJECT MANAGER

FUNCTIONS

- DETAIL ENGINEERING
- PROCUREMENT
- QUALITY ASSURANCE
- CLEAN-UP
- CONSTRUCTION MANAGEMENT
- CONSTRUCTION
- COST AND SCHEDULE

MAJOR CONTRACTORS AND VENDORS
TO TMI 1 & 2

VENDOR	DESCRIPTION OF SERVICES	EFFECTIVE DATE & TYPE OF CONTRACT		MAXIMUM DOLLAR VALUE(a)	APPROXIMATE NUMBER OF PERSONNEL DEDICATED	METHOD OF CONTROL
Gilbert Associates, Inc.	Engineering and Design Services for TMI #1 Modifications (Predominately)	3/27/79	Technical Services	$ 2,000,000	50 - 75	Task Releases against Estimates
Babcock & Wilcox Company	Engineering, Design & Safety Analysis for TMI #1 NSSS. Provide Start-Up and Operator Retraining Support	3/27/79	Technical Services	6,100,000	N/A	Task Release/Lump Sum/ Cost Reimbursable
Catalytic, Inc.	Construction Services for TMI #1 Modifications Repair & Preventitive Maintenance	1/01/79	Maintenance Services	10,000,000	30 - 200	Work Authorization
Bechtel Corporation	Design & Construction of Administration Building Planning & Managing Unit #2 Entry, Fuel Removal and Decontamination	5/31/79 (b)	Letter of Authorization Engineering & Construction Management	250,000 4,000,000	30 - 200	Individual Tasks Scope of Work
Battelle Institute	Lab Analysis & RAD Technical Services	2/14/80	Technical Services	100,000	N/A	Task Releases against Estimates
Hittman Nuclear	Radwaste Transport & Disposal	1/16/80	Subcontract	100,000	N/A	Unit Prices
Energy, Inc.	Accident Analysis & Licensing Support	10/31/79	Technical Services	700,000	N/A	Unit Prices & Cost Plus
RAD Services	Radiation Monitoring Equipment Repair and Calibration	11/08/79	Technical Services	900,000-1979 900,000-1980	N/A	Unit Prices
Capolupo & Gundel	Radioactive Water Processing	2/26/80	Subcontract	3,255,000	N/A	Time & Materials
Epicor, Inc.	Resins and Technical Services for Radioactive Water Processing System	3/24/80	Technical Services	1,900,000	N/A	Time & Materials
H. P. D., Inc.	Radwaste Evaporator Equipment	11/14/79	Purchase Order	892,992	N/A	Lump Sum
Stafco	Technical Writing Services	2/06/80	Technical Services	286,900	N/A	Unit Prices & Cost Plus
Modesto	Construction Equipment Rental and Repair	1/21/79	Equipment Rental	4,200,000	N/A	Unit Prices
Oak Ridge National Laboratories	Sample Analysis and Radwaste Technical Services	1/17/80	Technical Services	No Funding	N/A	Time & Materials by Task
Chem Nuclear	Submerged Demineralizer - High Level Waste Processing	6/14/79	Technical Services (Design) Subcontract (Operation)	1,800,000 (b)	N/A N/A	Maximum Guarantee Unit Prices and Rates
Burns & Roe	Engineering & Technical Services	3/27/79	Technical Services	5,000,000	20 - 80	Task Release

N/A Not Available
a) Maximum Funding or Initial Funding
b) In Negotiation

supply exists, alternative acceptable products are examined. Negotiated and cost plus contracts are used when the scope of work is ill-defined or the other types of contracts would be costlier because of various contingencies. Contracts are normally fixed price, unit cost or cost-plus and specify either a guaranteed maximum, a fixed fee or an incentive fee. Cost-plus contracts are used exclusively when other types of contracts will not produce reasonable results. Cost-plus contracts require higher levels of approval than other types of contracts.

Standard service, equipment, and construction contracts have appropriate cost and schedule controls. Several contracts were reviewed during the audit. Standard terms and agreements are provided for material and equipment, outside labor, consulting services, land rights and easements, leases, fuels, and power agreement contracts. Standard terms vary by contract type, but all contain comprehensive terms and every contract contains an upper price boundary.

The selection processs for the contractors on TMI 1 appears to have been reasonable and justifiable. The selection of Gilbert Associates and Babcock & Wilcox was predicated upon their prior involvement in the design of TMI 1. Similarly, Catalytic, Inc. was the maintenance contractor for both units. Because of their prior familarity with design and construction of TMI 1, experience with maintenance procedures, and access to local labor markets, these contractors were the logical choice at a time when decisions had to be made quickly to stabilize the conditions at Three Mile Island.

The selection of Bechtel Corporation as the cleanup contractor on TMI 2, although not well documented initially, was appropriate. Immediately following the accident, GPU management recognized that the assistance of an outside firm or firms would be required for the clean-up activities. Several possible candidates were reviewed, and Bechtel was tentatively chosen as the major contractor for the TMI 2 cleanup. Bechtel began performing studies for GPU based upon a letter of intent. GPU is negotiating a contract with Bechtel for the remainder of the clean-up at the TMI containment building.

The selection of Bechtel was based primarily upon several factors:

- Prior nuclear power plant experience, including engineering design, procurement, construction, and start-up experience;

- Prior experience in designing and building nuclear fuel reprocessing facilities;

- Knowledge of governmental and other agency interfaces;

- Willingness to make a unique commitment of an organization dedicated to the planning function; and

- Management skills in engineering and constructing projects ranging from power plants to pipelines.

Formal documentation justifying the selection of Bechtel as the contractor for the clean-up activities did not exist. Because this contract will be significant, both in terms of the dollars involved and the magnitude of the problems with TMI, a clearly justifiable decision process on this selection should exist to withstand any possible future scrutiny. During the course of this study, GPU management reevaluated Bechtel's selection and provided adequate documentation of this selection.

PROJECT MANAGEMENT SYSTEMS

Responsibility for developing and implementing project management systems resides in the Management Services Group of the Generation Division of GPUSC. The day-to-day operation of such systems is a function of the specific project group, as shown on Exhibit V-7. These responsibilities are in the process of becoming a part of the administration group of the TMI Generation Group and the eventual GPU Nuclear Corporation. GPU has developed its own Project Control System (PCS) to be utilized on TMI 2 for accounting, budget and cost control functions. The PCS is a modified version of the Construction Management System (CMS) used during the construction of TMI 2. The development of a more sophisticated control system for the Forked River project, which is based on "Earned Value" concepts, has been delayed because of a lack of funding.

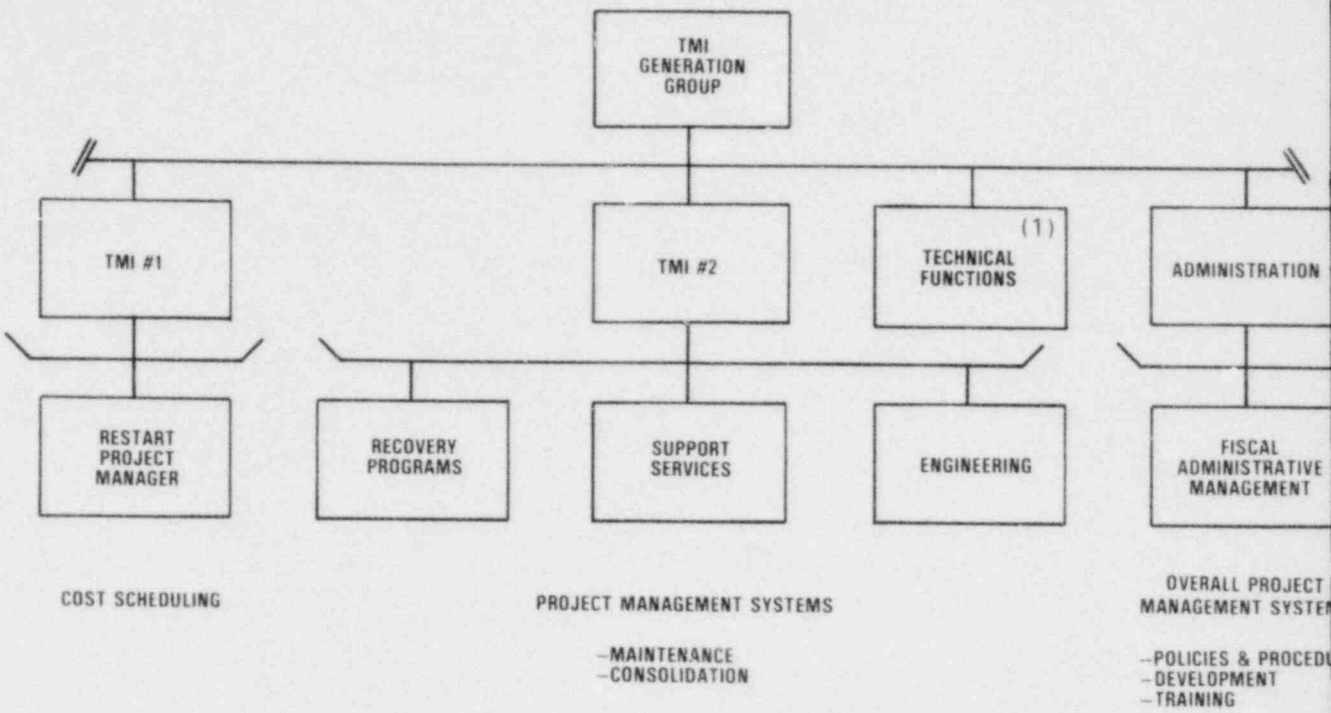
Work Breakdown Structure

GPU has modified its work breakdown structure for utilization at TMI 2. The Work Breakdown Structure consists of approximately 45 work packages, as schematically shown on Exhibit V-8. Each work package identifies a scope of work to be performed. Although at this time it is not possible to completely quantify all of these work packages over the life of the project, estimates have been made for the work packages in 1980. Specific individuals in the TMI Generation Group have been assigned responsibility for accomplishing specific tasks in the work packages within the approved budget guidelines. These work packages are basically "cost centers" at a relatively high level in the organization.

Project Management Systems and Controls

The project management systems contemplated for TMI 2 appear to be appropriate. Various levels of schedules are planned for use at TMI 2. These are referred to as the key plan, level one, and level two schedules. The detailed schedules and estimates for activities of the various organizational groups involved in the clean-up of TMI 2 are the responsibility of those groups to produce. Schedules of the level two detail are maintained by the cognizant organization responsible for that portion of the work. These schedules are then coordinated and integrated into the level one and key plan schedules. A 90-day "look ahead" is also contemplated; this will focus on activities to be undertaken immediately.

ORGANIZATIONAL RESPONSIBILITIES FOR PROJECT MANAGEMENT SYSTEMS



(1) Technical Functions has engineering responsibility for TMI-1 and TMI-2

WORK BREAKDOWN STRUCTURE FOR TMI-2

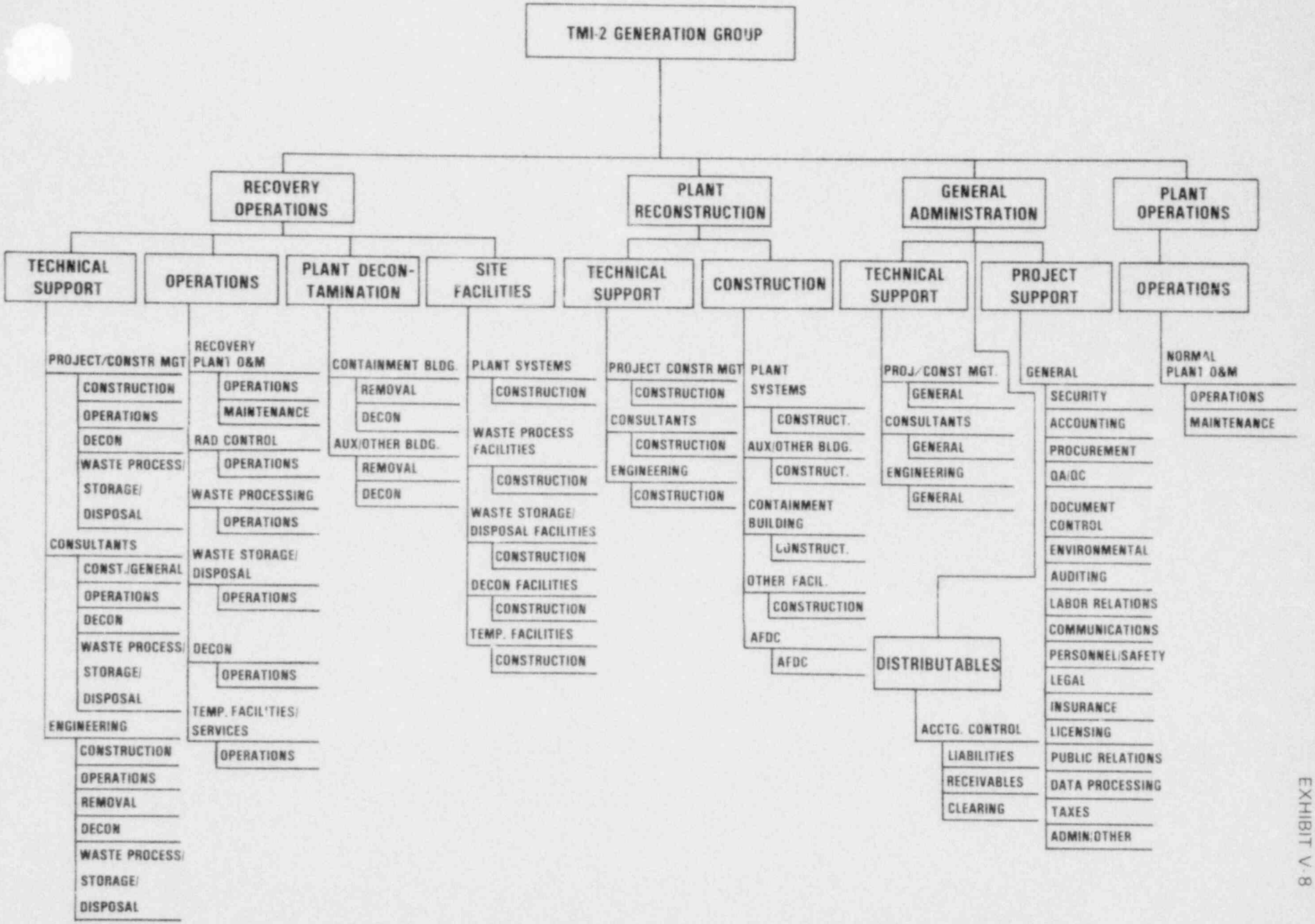


EXHIBIT V-8

Project controls to be used by Bechtel and GPU were not defined at the time of TMI's review. Bechtel will have a major responsibility for the detailed project management systems on the TMI 2 clean-up. As the major contractor, Bechtel will carry out the detailed planning, scheduling, estimating, and cost control functions. It is expected that Bechtel's project management systems will be modified to interface with GPU's project management systems; however, the precise details of this interface, reporting frequencies, and information formats had not been clearly defined. GPU management has subsequently indicated that controls have been agreed upon and are now being implemented.

CONSTRUCTION/CLEAN-UP MANAGEMENT

As discussed previously, construction activities associated with TMI 1 and 2 and cleanup activities associated with TMI 2 are primarily the responsibility of various contractors retained by GPU. These work forces are managed either directly or indirectly by GPU personnel.

Labor Agreement

The recently signed site-wide labor agreement, which covers all maintenance and construction activities, provides unusual flexibility to GPU. The contract recognizes the unique impact that radiological controls will have on the clean-up and recovery process. GPU was able to negotiate numerous items which will provide greater protection to craft workers, improve productivity, and permit the clean-up to be expedited. These provisions include:

- Working hours based on an alternating 4x10 hour shift basis if desired;

- A strong "no-strike/no-backout" provision with expedited arbitration;

- The right for GPU to direct workmen unilaterally in the radiological control and other areas;

- The ability of GPU to use its own employees as well as contractors in performing the initial clean-up, decontamination, and radioactive waste processing work;

- The ability to transfer operating engineers from one piece of equipment to another during a shift; and

- The formation of a joint labor-management-owner committee to interpret the agreement as necessary.

Methods Improvement Program

Productivity at TMI could be increased by establishing a full-time methods improvement program. Work sampling and methods improvement analyses can yield significant improvements in productivity. Experience at other

construction sites indicates that significant cost savings are achievable over the life of a project and productivity increases of 15% and more have been realized as a result of effective methods improvement programs. While radiological considerations will have a significant impact on cleanup activities at TMI, it is reasonable to assume that some productivity improvements will be possible with a concerted methods improvements thrust.

GPU has performed work sampling since 1975, when studies were conducted at the Three Mile Island units and the Forked River project. These techniques have been used during both the construction and operation phase (primarily refueling) of the Three Mile Island units. GPU recently conducted and is in the process of evaluating work sampling studies of activities at Three Mile Island. Steps have been taken to minimize delays and increase direct work utilization at TMI. Support facilities (lunch rooms, etc.) have been located as close as possible to the craftsmen's work area to minimize travel associated delays, and the optimal location of tools and other items is being studied.

Nevertheless, the current methods improvements focus at TMI is understaffed, and investigations are performed less frequently than is desirable to achieve the maximum cost avoidance.

Construction Clean-up Delays

Construction clean-up activities are experiencing a variety of delays because of financial and regulatory constraints. As noted in TB&A's testimony, clean-up activities have been impacted because of financial constraints. Clean-up activities are being planned and revised as necessary in reponse to regulatory constraints, the expected schedule of NRC actions, availability of technical information and financial limitations. Bechtel's engineering and planning activities associated with the clean-up are being delayed. Similar delays are being experienced with attempts to bring TMI 1 back into service.

Activities that were initially contemplated to begin in 1980 are being curtailed because of regulatory delays. The NRC has not developed criteria for performing the clean-up and recovery of the units. The criteria that govern activities at other nuclear facilities are not being applied to TMI.

Additional delays could occur because of NRC's lack of approval or disapproval of GPU's plan to use the Submerged Demineralizer System (SDS) for processing high activity water. The water in the containment building constitutes the single largest danger to the public at this time. To minimize this danger, the radioactivity contained in this water must be captured and immobilized. To minimize any regulatory delays, GPU has asked the NRC to separate its review of the SDS from the Environmental Impact Statement.

In August 1980 the NRC advised Met-Ed that it was its intention not to approve the operation of the SDS until after the final Programmatic Environmental Impact Statement which is unlikely to be issued until February 1981.

Conversely, the DOE has indicated that it believes that GPU "could use the SDS to decontaminate the water in the containment building and then store the radioactive resins until the disposal question is resolved adequately to permit further processing of the contaminated resins. An environmental assessment of the SDS operation (similar to that done for EPICOR and the Krypton purging) would form the basis for this decision, and would be completely consistent with the requirements of the National Environmental Policy Act. Thus, clean-up of the water could proceed when the SDS is completed at the end of 1980 and not await the completion of a full generic Environmental Impact Statement." These delays and uncertainties are materially contributing to increased costs for the clean-up and restoration of TMI.

SUPPORT ACTIVITIES

Several support activities were investigated during this review including:

- Licensing
- Radiological Controls
- Materials Management
- Quality Assurance

Licensing

The licensing area was reviewed during the reconnaissance phase of the review and was addressed in TB&A's testimony of March, 1980. The primary conclusion of the review was that the regulatory process rather than the resolution of technical issues would be the main factor in controlling the restart of TMI 1 and the clean-up timeframe for TMI 2.

Radiological Controls

Radiological controls at TMI have been substantially improved in the last year. In response to studies conducted by such groups as NRC's Blue Ribbon Panel of Radiological Controls, audit teams composed of individuals from the Electric Boat and Yankee Atomic organizations and numerous other radiation control consultants, GPU has recognized the need to restructure the radiological controls programs at TMI. A radiation protection plan was prepared and submitted to the NRC for approval in December 1979. Exhibit V-9 lists many of the programs that are currently underway to address the various audit findings and recommendations of these studies. Organizationally, radiological control has been split into two units. Radiological control areas will report to a Vice President of Radiological and Environmental Controls in GPU Nuclear Corporation which should provide assurance that this key function will have appropriate visibility and management attention.

RADIOLOGICAL CONTROL MANAGEMENT PLAN

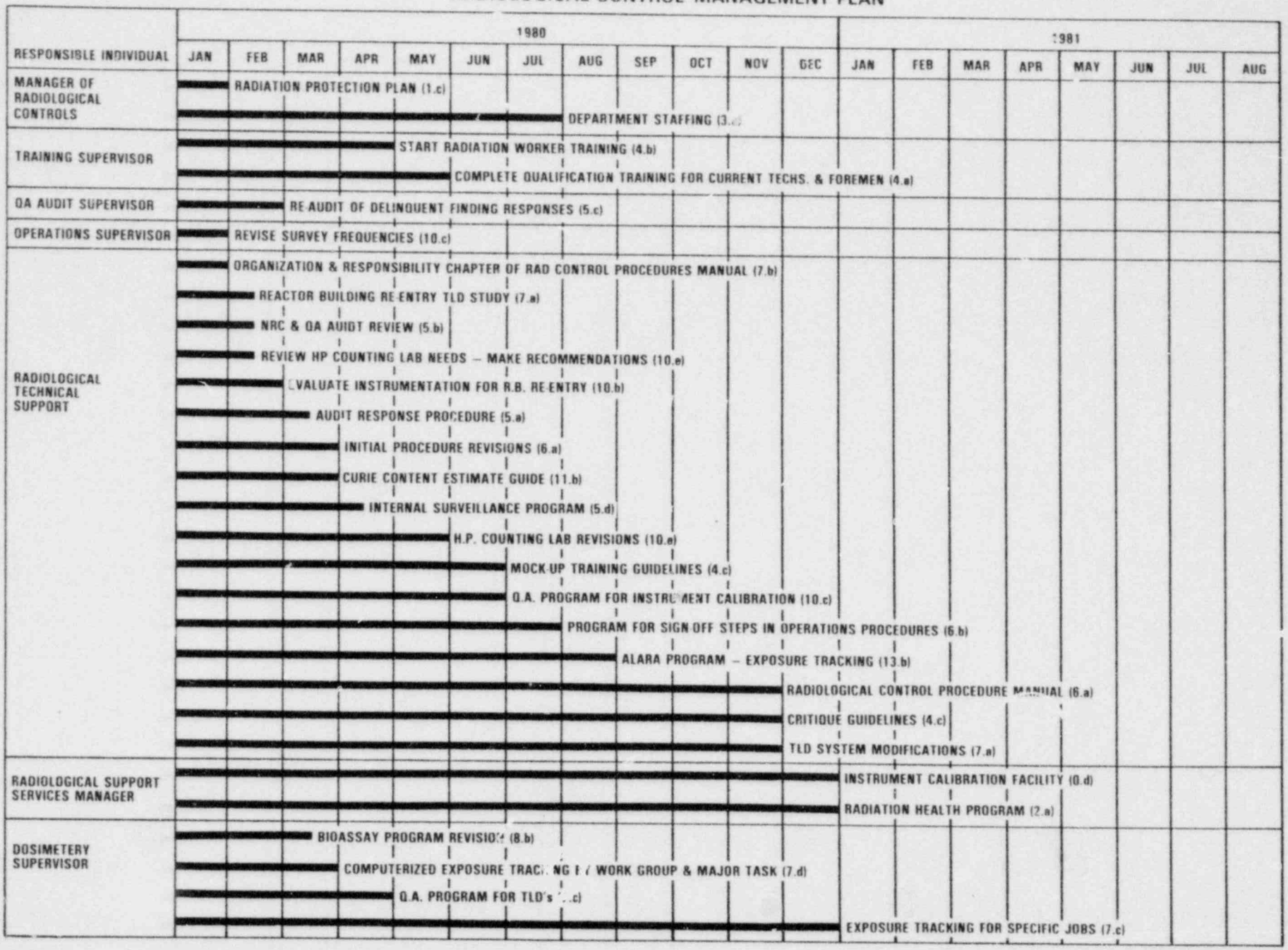


EXHIBIT V-9

Materials Management

The materials management functions at TMI are appropriately managed. The materials management function, which includes purchasing, warehousing, and computer support systems, is the responsibility of the Director of Administration in the GPU Nuclear Group (who also serves as the Vice President of Materials Management for GPUSC). GPU is beginning to achieve the benefits of several years of systems development work in the materials management area. Requisitions can be tracked by an on-line purchasing system, and warehouses at TMI are appropriately organized and secured. The GPU System, in committing funds for its projects and operations, employs a review system to assure that such commitments are made in accordance with system-wide policies and plans. Levels of authority for approval, review, coordination, and signature are well defined, comprehensive, and adequate to assure control over the materials management and procurement functions.

Quality Assurance

The Company is taking appropriate steps to upgrade the quality assurance programs for the nuclear units. As a result of lessons learned from the TMI 2 accident and subsequent studies, the Company is aggressively reviewing and upgrading its quality assurance programs. Roles and responsibilities are being redefined consistent with the concept of a nuclear organization.

STRATEGIC RECOMMENDATIONS

In the nuclear area, GPU management must focus its efforts on several key issues. Prompt consideration and implementation of the recommendations presented below will ensure that the GPU nuclear organization quickly reaches its full potential.

The strategic recommendations for GPU's nuclear organization fall into six categories:

- Organization
- Project Controls
- Methods Improvement Program
- Public Relations
- Public Forums
- NRC Delays

ORGANIZATION

GPU/Met-Ed should expedite the development of formal roles and functions for the GPU Nuclear Corporation. Specific issues that should be addressed and resolved include:

- Personnel locations
- Salary ranges
- Modifications to various GPU procedures.
- The development of detailed missions and functions
- Clarification of organization interfaces
- Development of job descriptions
- Personnel selection for the various positions
- A study of the space and logistical requirements for the Parsippany Headquarters of GPU Nuclear Corporation.

Particular emphasis needs to be placed on:

- The role of the Board of Directors of GPU Nuclear Corporation
- The role and function of the President's office to provide assurance that the span of control is appropriate and that all nuclear activities receive sufficient management attention
- The organizational interface between the operating plants and the technical functions groups
- The relationship between the Nuclear Safety Assessment Group, the General Operating Review Board (GORB), the Generation Review Committee (GRC), and the Plant Operations Review Committee (PORC)
- The various support functions, such as accounting, personnel, wage and compensation, to avoid any overlapping responsibilities between GPUNC and GPUSC.

PROJECT CONTROLS

The project controls to be used by GPU and Bechtel should be reviewed for adequacy and properly implemented. Interfaces between GPU and Bechtel project management systems should be resolved promptly. Reporting frequency, report layouts, and areas of responsibility need to be clearly defined. This effort should produce a Bechtel/GPU project controls manual for use during the clean-up effort that is similar to the Bechtel/GPU Procurement Manual that is under development.

METHODS IMPROVEMENT PROGRAM

An effective Methods Improvement Program should be established for TMI. GPU personnel should be assigned to a methods improvement department at TMI 1. Additional people may be required on a part-time basis to help with work sampling or operational analysis programs. Studies and analysis conducted by such a group would result in better utilization of the workforce at TMI and substantial costs avoidance.

PUBLIC RELATIONS

GPU should continue to improve its public relations efforts. The highly sensitive and emotional nature of the public reaction to nuclear power and the multitude of erroneous beliefs about its dangers necessitate considerable corporate emphasis on public relations. As mentioned previously, one of the very real constraints to the restart of TMI 1 and 2 may be the attitudes of local residents and other publics. Dr. Karl Cohen of Stanford University told a Congressional Committee on May 7, 1979 that the experience at Three Mile Island persuaded him that "The principal adverse effect on the public is psychic damage, inflicted by panic-mongers of every stripe." In so far as this is true, the importance of good public relations cannot be over emphasized. GPU must consider not only the local area but its entire service territory and all other interested publics such as the financial community and the Federal Government. GPU has begun to address its public relations problems and is actively searching for an individual to head up the communications function for the GPU Nuclear Group.

PUBLIC COMMITTEES

GPU should develop a forum for directly involving the local community and other public representatives in the evaluation of TMI related issues. In view of the extreme importance of the public's attitude and the need to develop greater public awareness of the ability of GPU to effectively manage the restart of the TMI units, GPU should consider the formation of "Public Committees" for each of its nuclear facilities. These committees would provide another window on company operations and an open forum for discussion of issues of general concern. These committees should be composed of community leaders and local citizens and should be actively involved in the review of management actions.

NRC DELAYS

GPU should develop a specific program to communicate the adverse effects of NRC delays to its publics and should encourage the NRC to quickly provide specific criteria for evaluation. While recognizing the unique circumstances and political sensitivity of the TMI accident, the NRC's indecisiveness and the resulting delays in the clean-up process are not acceptable. The delay in the Krypton venting activity is an example of the NRC's inability to make decisions in a timely manner. The NRC's refusal to condone GPU's pursuit of various alternatives for the clean-up process -- alternatives that are within the limitations of criteria used by the NRC in evaluating operations of other nuclear plants -- is difficult to rationalize.

The NRC is responsible for public safety and yet many of the delays it is causing may well contribute to greater long-term hazards. Since the NRC appears to be insensitive to the Company's needs, the Company should attempt to solicit the support of its various publics, including the Pennsylvania and New Jersey Commissions, state legislatures, and governors to apply pressure to the NRC to expedite its decision-making process through all available means.

VI - ORGANIZATION

BACKGROUND

Since the late 1960's, the utility operating and management environment has become much more complex as costs and rates have risen, regulation has increased, and the future has become extremely unpredictable. To meet these conditions, GPU, like many other public utility holding companies, recognized the need for a higher degree of coordination and centralization of certain services to maintain and improve overall system operating effectiveness and efficiency. To provide this greater centralization and system-wide coordination, the GPU Service Corporation (GPUSC) was created in 1971.

As with many utilities, mergers, acquisitions, and combinations have been an integral part of the development of GPU and its operating companies. The mergers of North Penn Power with Penelec and New Jersey Power and Light with Jersey Central Power and Light are recent precedents for management combinations within the GPU system. Between 1951 and 1958, one individual was President of both Penelec and Met-Ed.

On January 17, 1980, in response to Commission inquires about GPU's long-term plans, the Chairman of GPU disclosed a proposal to combine the managements of GPU's Pennsylvania operating companies. The Commission asked TB&A to evaluate the proposal, as part of the ongoing mandated management and operations study, to ensure that it would be in the best interests of GPU's Pennsylvania customers.

The proposed management combination would not entail a financial and legal merger of the two companies. Stated simply, it would bring together under one management team the combined operations of Metropolitan Edison Company and Pennsylvania Electric Company and would produce most of the benefits associated with a financial merger.

This section reviews TB&A's role in refining the original management combination proposal, the criteria used to evaluate the proposal and the characteristics of GPU's Pennsylvania operations and GPU Service Corporation.

ROLE OF TB&A

The focus of TB&A's review was on organizational issues as they relate to the proposed combination. Methods and systems were reviewed to the extent that they might impact the proposed combination. The scope of the review included the transmission and distribution, business office, non-nuclear generation, financial, and administrative support organizations of both Pennsylvania operating companies and GPU Service Corporation (GPUSC). The role of GPUSC and its relationships with the Pennsylvania operating companies were reviewed to the extent that they might be affected by the proposed combination.

The TB&A project team consisted of consultants experienced in each area reviewed. Each consultant was assigned responsibility for reviewing a functional area in all three organizations; for example, the same consultant

reviewed the transmission and distribution operations in Pennsylvania Electric Company, Metropolitan Edison Company and GPU Service Corporation. This provided for consistent treatment of each functional area and an objective and realistic assessment of the managerial needs of a combined operation.

The dynamic and complex nature of corporate reorganizations necessitates an iterative approach. That is, reorganizations evolve typically from an original proposal that is continuously refined as new facts and perspectives present themselves. This iterative process is characteristic of the proposed management combination of GPU's Pennsylvania operating companies. In the past few months, TB&A has monitored and critiqued this iterative process. TB&A's input has resulted in a number of significant changes to the original proposal, such as an improved organization plan, the formulation of an objective process for selecting key personnel, the preparation of detailed plans for communicating the management combination to all parties, the preparation of an implementation plan and the identification of and commitment to the significant qualitative and quantitative benefits which would accrue to the Company and the ratepayers of Pennsylvania.

On June 26, 1980 as part of its annual review with the Commission GPU management made public its top level organizational plan for the combined managements and described the qualitative and quantitative benefits the Company expected to achieve. At this review TB&A presented a report on the status of its management and operations study and an interim report on the proposed management combination.

EVALUATIVE CRITERIA

In its review of the proposed combination, TB&A assessed the costs of combining managements and the benefits that might accrue, such as:

- Economies of scale, either in technology, support systems, direct or indirect labor
- Cost savings, either in direct cost reductions or avoided future costs
- Improved customer service levels
- The enhanced ability to redirect corporate strategy
- More widespread application of expertise through greater functional specialization
- Increased organizational flexibility and adaptibility in the future
- More consistent and timely response to external publics
- Improved career development opportunities for the Company's employees and concomitantly, the ability to attract personnel

- The opportunity to minimize the negative impacts of other necessary changes

- Improved control over operations.

In evaluating the proposed organization, several key questions were posed:

- Is the corporate organization structure logical and is it conducive to meeting stated corporate goals? Are the missions and functions clearly defined and understood? Is it cost effective?

- Are interfaces logical, well defined and understood? Between line and staff departments? Between operating companies? With GPUSC? Are there overlapping or duplicative responsibilities between departments?

- Is the organization consistent with geography and customer density? Can existing or improved levels of customer service be maintained? Can consistency in operations be maintained?

- Is the degree of centralized control and authority appropriate? Are spans of control appropriate?

- Do management systems for planning, administration, and control support the combined organization and achievement of corporate goals? Do they support decision-making and communication? Are they consistent with the organization structure?

- Are staffing levels, both in numbers and expertise, appropriate and do they support the achievement of corporate goals?

- Are potential cost reduction and efficiency gains significantly reduced by the restrictions on relocating personnel?

- Is the combination in conflict with, or is it impacted by, any other organizational proposals within GPU?

- What are the major operating improvements? Can they be quantified?

- Are there major increases in the scope of existing functions? Can they be documented? Are the new functions proposed by various departments necessary?

The best interests of ratepayers, investors and employees of GPU will be served only if the proposed organization satisfies the above criteria and achieves the previously described benefits.

GPU'S PENNSYLVANIA OPERATIONS

Exhibit VI-1 and VI-2 show the current organizations of Met-Ed and Penelec, respectively. Existing organizational differences evolved over time in response to the unique needs of the two companies. Some of the implications of these organizational differences are included in the following section. The similarities of the two Pennsylvania operating companies far outnumber the differences, primarily because of the commonalities of the utility industry and the standardizing influence of the GPU System. Nevertheless, a number of differences do exist. These have resulted from the unique historical development of each company, different philosophies of management, or the particular requirements of their operating environments. While the differences may appear to be subtle and qualitative in nature, they could become significant impediments or opportunities for improvement in the proposed management combination.

Current methods of operations are discussed in three sections:

- Generation; which includes non-nuclear power plant operations and maintenance

- Customer operations; which includes, transmission and distribution construction, operations, and maintenance and business office operations, consumer services, conservation and load management

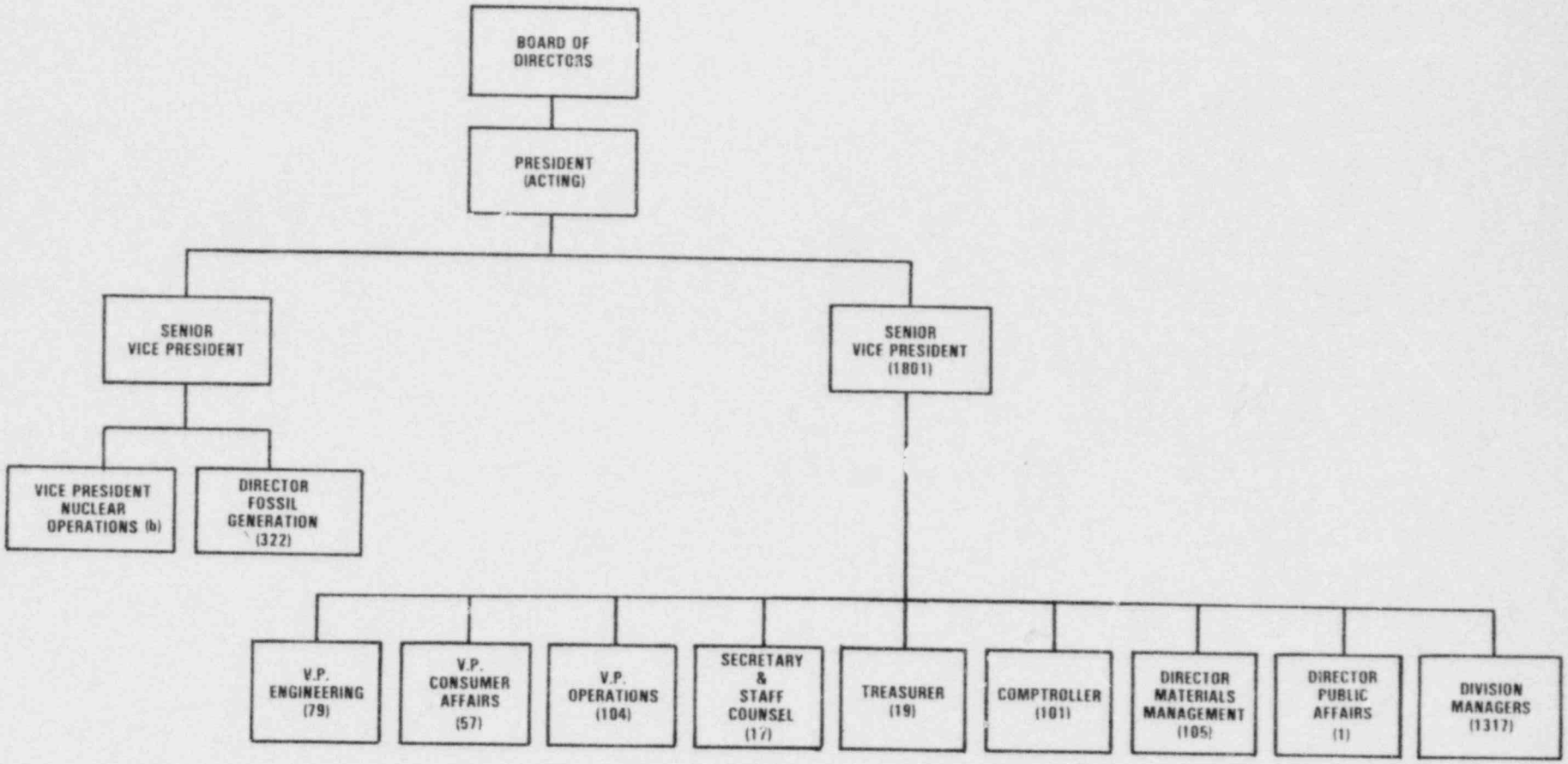
- support functions; which includes, accounting, treasury, personnel, communications, and materials management

Generation

The most significant differences between the companies lie in the generation area. The Met-Ed and Penelec Generating Divisions evolved with similar missions and functions but with slightly different emphases. Met-Ed owns a 50% share and is the operator of the Three Mile Island nuclear power plant. That 50% share represents over 40% of Met-Ed's total generating capacity. Its only other major generating stations are two coal-fired plants, Portland and Titus. Penelec, on the other hand, operates no nuclear plants (although it has a 25% interest in TMI), and uses coal almost exclusively for its generation.

This difference in generating mix caused a significant difference in manpower requirements and technical expertise. Since Three Mile Island was the "flagship" of Met-Ed generation, primary emphasis was on operating the nuclear units. As public concern over nuclear power induced additional regulatory requirements in recent years, more resources were devoted to Three Mile Island. Nuclear generation expertise became so specialized that two staffs were established; one for nuclear and one for coal-fired generation. The accident at TMI caused a severe drain on the Met-Ed generation staff since most nuclear-associated staff were relocated to the TMI site. This was also a time when Met-Ed's need for fossil generation increased greatly.

PRESENT CORPORATE ORGANIZATION OF
METROPOLITAN EDISON COMPANY(a)

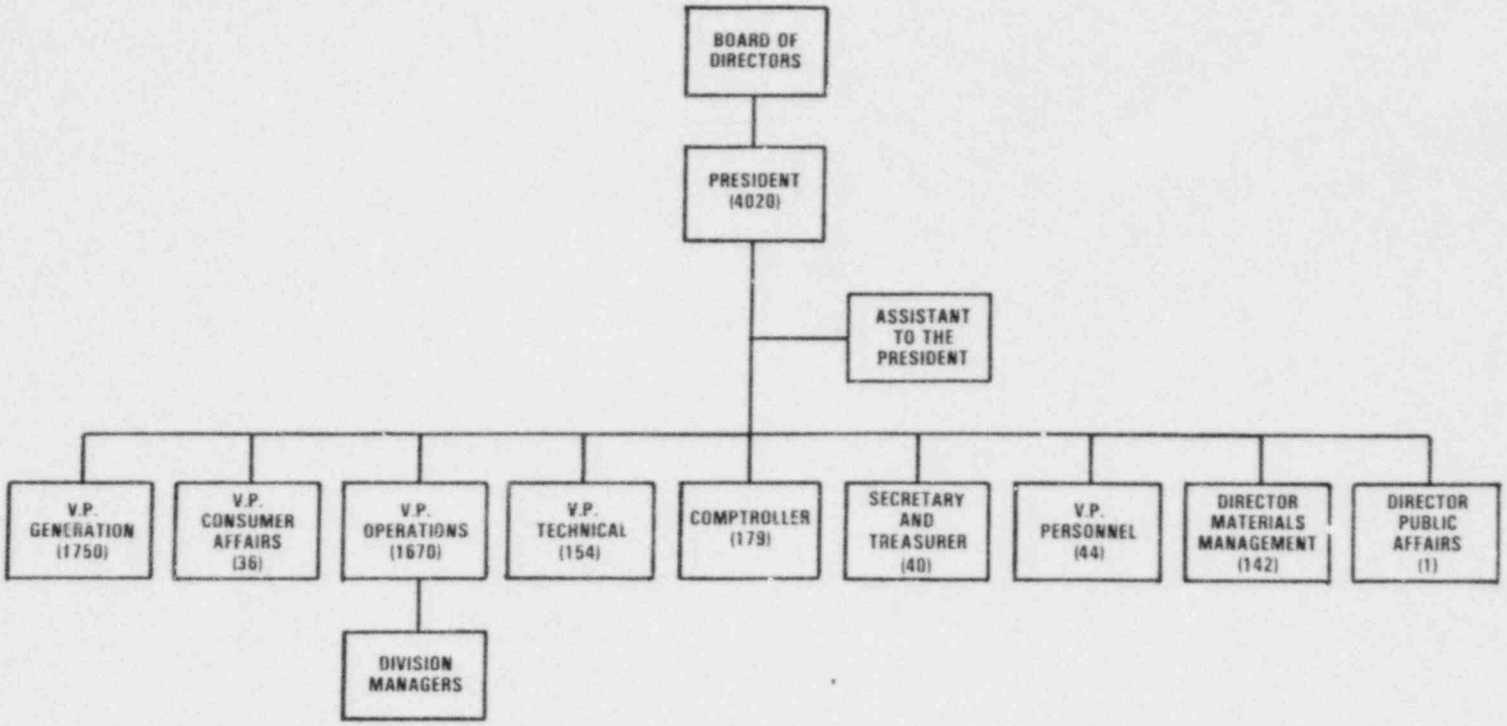


(a) Numbers under each function are personnel complements as of 1/1/80.

(b) Personnel complement of nuclear operations is discussed in Chapter V.

EXHIBIT VI-1

PRESENT CORPORATE ORGANIZATION OF
PENNSYLVANIA ELECTRIC COMPANY[a]



(a) Numbers under each function are personnel complements as of 1/1/1980

EXHIBIT VI-2

In September 1979, Met-Ed's fossil generation organization was formally separated from nuclear generation and reorganized. One purpose of the separation was to establish a dedicated department that would provide on-site and off-site technical support, engineering, licensing and regulatory activities, budgeting and cost control, training, material acquisition, maintenance planning and scheduling, and overall administration, as well as line responsibility for fossil generation. The staff was quite small, because of the continued need for resources at TMI and the corresponding financial restrictions the accident placed on the other operations of the company. Since, a large staff could not be justified for two generating stations, the primary emphasis was on maintaining the two stations and only limited efforts were made to enhance unit performance.

Penelec's generation department was in a different position. The company headquarters in Johnstown and most of its service territory are located in an area whose economy depends heavily on coal mining and associated industries. Power plants located in this area minimize the high cost of coal transportation.

Because of these logistics and the increasingly favorable environment for coal-fired generation, Penelec began operating power plants in which it shares ownership with other utilities that are located some distance from the plants. In addition, two plants, Keystone and Conemaugh, are operated by Penelec even though it has no ownership interest in either of them. These two plants represent GPU's leadership in the development of coal-fired generation. While GPU did not need the total capacity of these plants, it recognized the economies of their size, their future value to the PJM power pool, and Penelec's unique capability to operate them. Because Penelec operates a large number of plants, it is able to support a much larger and more expert support staff, particularly in engineering, and can apply to each plant the specific expertise required. The capabilities of this staff were demonstrated in solving design problems in the newer units at Homer City. Moreover, the management of Penelec's Generation Division employs state-of-the-art systems for maintaining its generating plants.

Customer Operations

Customer operations refers primarily to the line functions that are decentralized throughout the service territories of the two companies. These functions tend to be facilities-related or customer-related, as illustrated below:

- o Facilities-related
  - Construction and maintenance of distribution facilities
  - Construction and maintenance of subtransmission facilities
  - Operation and maintenance of electrical equipment
  - Provision of new service
  - Tree trimming
  - Right-of-way maintenance

o Customer-related
  - Meter reading
  - Credit and collection
  - Customer accounting
  - Responding to customer inquiries
  - Community services
  - Consumer services
  - Conservation and load management promotion

These field operations are organized in geographical divisions in both companies, and have the same scopes of responsibility. Penelec has five divisions serving its 509,000 customers, while Met-Ed's four divisions serve 358,000 customers; these divisions are further broken down into 23 and 15 districts, respectively. Because customer density is higher in Met-Ed's service territory, Penelec's divisions serve larger geographic areas.

Although the overall responsibilities of the divisions are the same, there are a number of significant differences in how these responsibilities are carried out by the two companies and by each company's divisions. The companies use different forms, procedures, management systems and operating methods. There are also differences in the management systems used within the Penelec divisions.

Corporate staff support for division customer operations is the responsibility of the Vice President Consumer Affairs, and the Vice President Engineering (or Technical) in each Company. Although the primary roles and responsibilities of the corresponding staffs are essentially the same in each Company, the method of execution differs and the functional emphasis is not the same. For instance, Penelec has undertaken several transmission construction and improvement programs recently because of system requirements. This has required a correspondingly larger staff in transmission engineering and construction management at Penelec.

As pointed out previously, direct line responsibility for division customer operations varies between the two companies. At Penelec, the division managers report to the Vice President Operations, who has a small administrative staff reporting to him. At Met-Ed the division managers report to the Senior Vice President; the Vice President Operations has a large administrative staff for division customer operations which also includes corporate personnel and services.

The perception is widely held among GPU personnel that there is more centralized control over division customer operations at Met-Ed. However, the difference in division manager autonomy in the two companies is a matter of degree. A certain amount of decision making authority is granted the division managers in both companies.

The relatively more decentralized management approach attributed to Penelec may have resulted from (and, in fact been more desirable due to) the more widely dispersed service territory and greater distances between divisions and corporate headquarters. However, inflation, increasing rates,

declining productivity and the resultant financial constraints are now demanding more corporate guidance and professional direction in areas such as work methods, productivity standards, equipment standards, work priorities, and cost control.

The management of the GPU operating companies has taken several actions to strengthen the central control over division operations:

- Establishment of a centralized materials management organization in each Company as well as at GPUSC to achieve the most efficent and effective acquisition and distribution of materials.

- Establishment of an Operations Analysis function in each Company with coordination through GPUSC. These groups have developed productivity standards, manpower planning, and performance reporting systems in a number of functional areas.

- Initiation of functional committees which are chaired by personnel from various GPUSC departments and are made up of officers and managers of the respective departments in the operating companies. The purpose of these committees is to coordinate similar activities among the companies, to standardize operating methods and procedures, and to develop firm-wide policies.

Aside from these activities, the two Pennsylvania operating companies have taken different courses to achieve centralized control within their respective operations. As noted previously, the Vice President Operations at Penelec maintains a small administrative staff to support division operations. While it is difficult to achieve functional control with this staff, Penelec has installed an effective management reporting system to monitor budget performance. Met-Ed has taken a more direct approach to achieving functional control by forming the equivalents of the GPU functional committees among the various customer operations functions in the division. These committees have helped achieve greater standardization of methods and procedures among the four divisions, ensured the implementation of corporate policies and programs, and served as a forum for discussing operating plans and performance. Met-Ed staff tend to make more field visits because of the more compact service area. As a result they are more involved in day-to-day field activities and exercise more influence on the decision-making process for projects. The fact that the Vice President Operations at Met-Ed is also responsible for the corporate personnel, transportation, and building services functions provides additional leverage for exercising such control.

Support Functions

Financial operations in GPU's operating companies are predominantly accounting oriented. Many of the treasury functions typically performed by independent utilities are carried out by GPUSC for the operating companies. Cash flow is the primary treasury function assigned to the operating companies. The operating company financial staffs also provide supporting analysis, information, documentation, and witnesses for rate cases.

Although the titles of the managers vary, responsibilities are similar. Penelec requires a larger accounting staff because it serves more customers, must account for the jointly owned power plants which it operates, has a more centralized budget analysis function, and has a less automated accounting system. One other difference is that the Secretary and Treasurer positions are combined at Penelec and separate at Met-Ed.

There are some differences in the relative mix of personnel assigned to the various financial functions in the two companies. This reflects the fact that the two companies are at different stages of development in implementing various mechanized accounting systems. New computerized accounting systems are developed for GPU system-wide implementation. These systems are typically scheduled to be implemented in a phased manner in the three operating companies. For example, the Base Customer Accounting System is already in place in Met-Ed and scheduled for installation in Penelec over the next two years. Penelec, on the other hand, has a more fully developed management reporting system, particularly for budget-performance, than does Met-Ed. Different accounting systems, mechanized or otherwise, require different levels of manpower to support them.

Although there are some differences between the accounting systems in the two companies, they are necessarily compatible. FERC and other external reporting requirements have had a standardizing influence on methods of utility accounting. In addition, internal corporate accounting for GPU requires consistent information for budgeting, planning, forecasting, and management reporting purposes. The trend toward standardization will continue in order to avoid the proliferation and the prohibitive costs of maintaining unique systems for each company.

Other support functions include, materials management, communications, public affairs, transportation and personnel. In both companies, materials management and public affairs are headed by directors who report directly to a senior officer of the company. Also in both companies the transportation function is a responsibility of the Vice President Operations and the communications function is located in Consumer Affairs. One of the organizational differences between the two companies' support functions is the reporting relationship of the personnel departments. At Met-Ed this function is a responsibility of the Vice President Operations, whereas at Penelec the Vice President Personnel re- ports directly to the President.

There are very few significant differences between the methods of operation of the support functions of the two companies. The accident at TMI required a substantial communications effort on the part of Met-Ed and a number of employees were relocated to the site. A communications function has been proposed in the nuclear generation organization and would become part of GPU Nuclear Corporation. Otherwise the two communications organizations have similar responsibilities.

The personnel function in both companies is decentralized. The corporate personnel staffs are responsible for developing policies and

procedures for the operating companies and for administering those policies and procedures for the corporate staff. The generation and customer operations functions in both companies maintain administrative staffs to handle personnel matters for employees in the field.

The materials management function was established at each company several years ago as part of a GPU system-wide program. Systems and procedures were developed for all of the companies and are coordinated by GPUSC. Although this function is still in a developmental stage, the methods of operation at the two companies are very similar.

GPU SERVICE CORPORATION

The GPU Service Corporation acts essentially as staff to the operating companies. The current organization of GPUSC is shown in Exhibit VI-3. The functional officers of GPUSC correspond to many of the functions in the operating companies. Certain services are provided on a centralized basis by GPUSC because the Company believes it is cost effective to do so. In other functional areas, GPUSC helps establish uniform polices and practices among the operating companies and provides a mechanism for intercompany exchange of ideas.

The GPUSC Board of Directors, which consists of the Chairman of the Board and the Executive Vice President of GPU and the Presidents of GPUSC and the three operating companies, provides the focus for management control of operations and reviews operating and financial results at its monthly meetings. To further support operating company management, a number of information systems have been developed on a GPU systemwide basis, including a corporate goals and objectives program.

The role of the service company in the GPU organization is typical of utility holding companies in the U.S. As is also typical, the costs of the GPUSC services are allocated to the operating companies based on actual usage and/or other equitable allocation methods. GPUSC has a total staff of about 900; over 500 of these people are located in Pennsylvania, primarily at the Reading facility. The proposed formation of GPU Nuclear Corporation would reduce the GPUSC staff by about 365 persons. Of the remaining personnel, about 375 perform systemwide functions (such as information services, system operations, internal auditing, corporate planning and rate case management) for the operating companies. About 70 persons are involved in coordination or support activities for functions in the operating companies (such as operations analysis, corporate secretary, materials management, and telecommunications) and about 90 persons provide support (such as transportation, building and reproduction services) to GPUSC itself. The following paragraphs describe the roles and responsibilities of GPUSC in each functional area.

PRESENT ORGANIZATION STRUCTURE OF

THE GPU SERVICE CORPORATION

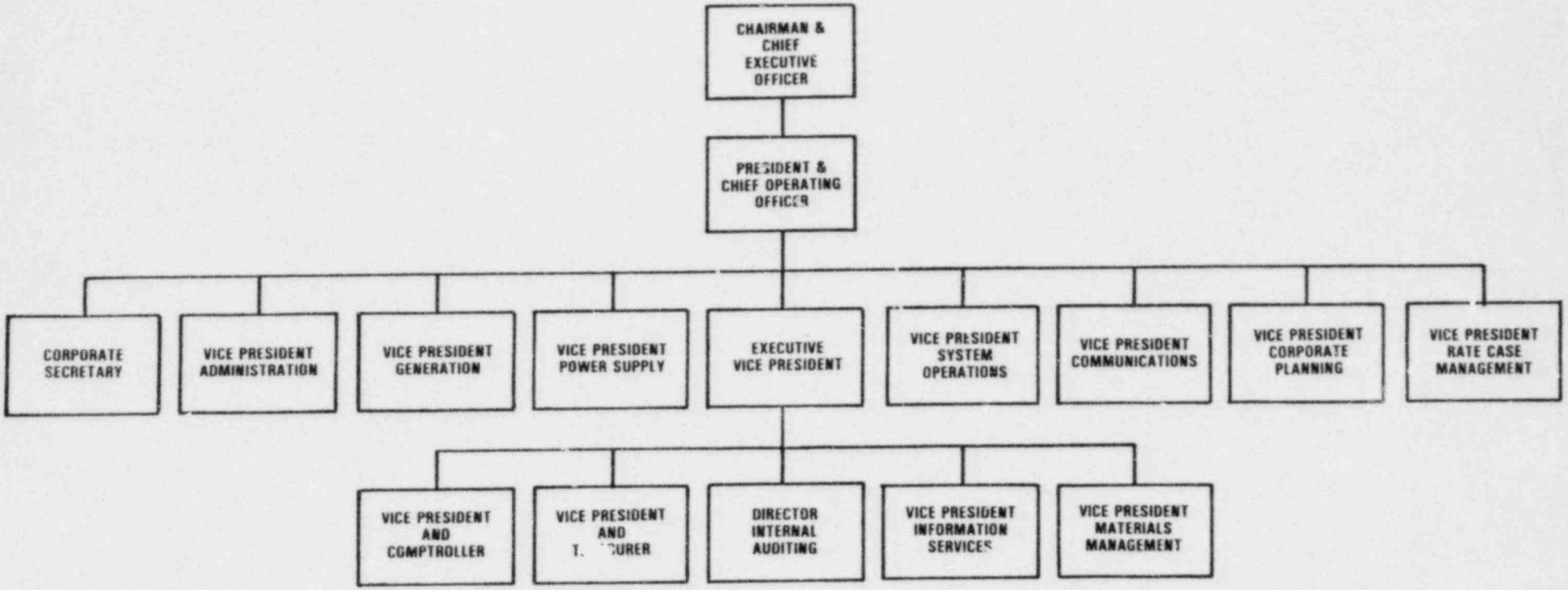


EXHIBIT VI-3

Generation/Nuclear

GPUSC has historically managed design and construction of nuclear generating facilities. This organization is heavily involved at Three Mile Island and will become part of the proposed GPU Nuclear Corporation which would also have responsibility for the operation of Oyster Creek and TMI.

Information Services

This function provides all of the data processing and system development support to GPU, GPUSC and the operating companies.

System Operations And Power Supply

System Operations functions include dispatch, production planning, generation and interchange forecasting, coordinated maintenance scheduling, and the design and construction management responsibility for system-wide transmission projects. Power Supply is responsible for power pooling and wheeling arrangements with PJM and other outside pools or companies; intra-GPU power pooling and transmission contracts and arrangements; coordination of all PJM committee activities and purchased power contracts; and communications with state and federal energy policy (FEA) organizations, including the FERC, on matters other than license and resale rate filings.

Corporate Planning

The Corporate Planning organization has responsibility for long-range load forecasts including leadership of the load research, load analysis, load management and conservation activities of the operating companies; site planning and water resources analysis for power plants, including small hydro design and planning; maintenance of the long-range corporate plan which recognizes generation mix, transmission needs, fuel trends, environmental obligations, financial constraints, and capital priority and allocation; development of analytical tools and models to aid in forecasting and decision making; and management of research and development activities of the corporation. All of these activities require extensive interaction with the operating companies to obtain data and translate the corporate plan into operational goals and objectives.

Internal Audit

This function provides internal financial auditing on a systemwide basis and assists the outside public accountants in the independent audit of financial statements.

Rate Case Management

The Rate Case Management organization has responsibility for: conducting all New Jersey, Pennsylvania, and Federal rate cases; communicating with all rate regulatory agencies; supporting the operating companies' cost

of service analysis and rate design; communicating revenue requirements and the impact of regulatory action to customers and investors; planning the rate-making needs of each operating company; and monitoring rate-making trends in GPU jurisdictions and the nation as a whole. The Rate Case Management organization coordinates all interactions with rate regulatory bodies, with support from the operating companies.

Accounting

The Vice President and Comptroller is the principal accounting officer of GPU and is accountable to the Board of Directors. This function is ultimately responsible for all accounting activities, including coordinating all financial information, consistency and integrity, establishing accounting systems, operations analysis (including manpower control) and reviewing all transactions affecting financial results.

Treasurer

This function is responsible for overall control and coordination of all state and federal filings, and provides a focal point for the cash management functions performed in the operating companies. The Treasurer handles all outside financings and working relationships with rating agencies, banks and other members of the financial community. This function also has responsibility for financial planning, financial forecasting, and the administration of pensions and payroll for GPUSC.

Corporate Secretary

This function supports the officers and legal counsels of the operating companies on corporate matters, regulation, contracts, claims, litigation, securities transfer, preferred stock dividend, interest and sinking fund disbursements. Services are also provided in connection with stockholders' and directors' meetings, and maintenance of corporate records, procedure manuals, and organization charts. This function also provides word processing and graphics support to GPUSC.

Materials Management

This function develops policies and systems and coordinates the materials management functions in the operating companies. It is also responsible for procurement and rentals for GPUSC.

Telecommunications

This function is responsible for the microwave relay system used in transmission dispatch and the computer data linkage between key generating stations and the computer facility in Reading. In addition, it has responsibility for the needs assessment and specification of telephone systems in the operating companies.

PROPOSED MANAGEMENT COMBINATION
ORGANIZATION FOR
GPU'S PENNSYLVANIA OPERATIONS

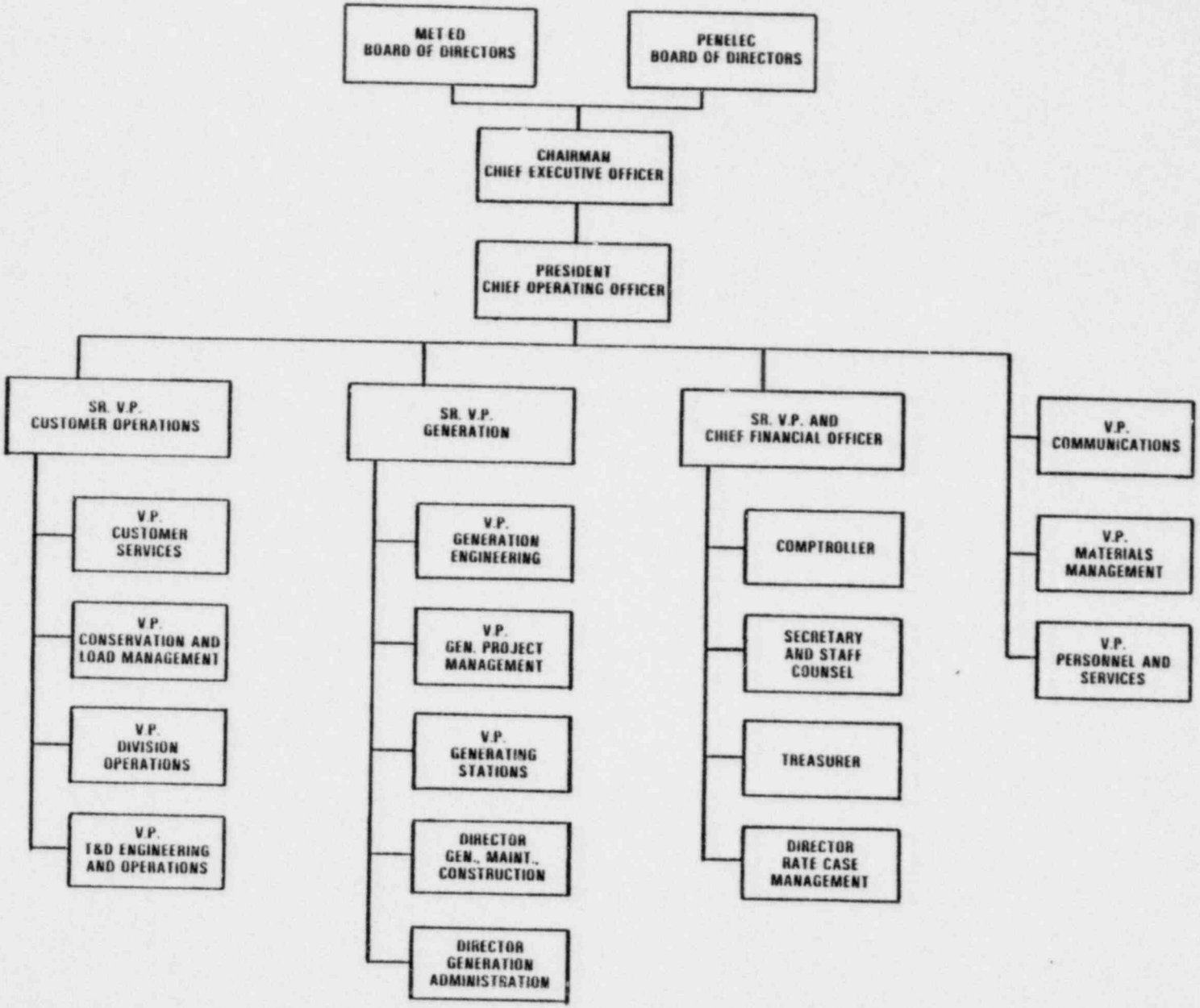


EXHIBIT VI-4

Communications

This function has responsibility for investor communications, public communications at the corporate level, communications policy, the annual report, and the quarterly report to stockholders. It also coordinates business office and consumer services activities among the three operating companies.

Transportation

This function supplies the transportation requirements of GPUSC, and is responsible for transportation policy across the system, including setting standards and specifications.

Administration

This function develops corporate policy and provides coordination in the areas of wages, salaries, labor relations, EEO, and fringe benefits. This function also provides all GPUSC building services in Parsippany and Reading.

KEY ISSUE ANALYSIS

The issues discussed in this section relate directly to the proposed management combination, the proposed consolidation of division operations and the role of GPU Service Corporation. Those related to the management combination are organized by functional area.

THE MANAGEMENT COMBINATION

General Issues

GPU management has proposed a streamlined functional organization for the combined management of its Pennsylvania operating companies. Exhibit VI-4, which shows the proposed organization, incorporates the changes made as part of TB&A's review and critique of GPU's original proposal. The highlights of this restructured organization are:

- Single point responsibility is established for each of the major utility functions: customer operations, generation, and finance.

- Responsibility for the Company's conservation and load management efforts is assigned to one individual at the executive level.

- The independence and high priority of materials management, particularly fuel procurement, are reflected in its direct reporting relationship to the President.

- The importance of communications, particularly with regulatory entities, is supported by the executive level position reporting directly to the President.

- The President's span of control is appropriate.

This organizational structure is appropriate for the Pennsylvania operating companies at this time and should provide significant benefits to GPU's Pennsylvania ratepayers. A number of the benefits of the combination are qualitative in nature and would produce substantial tangible benefits in the longer term. These benefits are as follows:

- The combined management will be able to respond in a more consistent and timely manner to the company's many publics, specifically the Pennsylvania Public Utilities Commission, the Pennsylvania legislature, other Pennsylvania regulatory agencies, and the general public of the Commonwealth of Pennsylvania.

- The combination will capitalize on the unique expertise, experience, and proven techniques of each company.

- Penelec's expertise and extensive experience in coal-fired generation should produce substantial benefits, particularly through improved plant performance.

- Met-Ed's approach to centralized control over division operations has been effective and should bring about greater methods standardization and improved levels of customers service in Penelec's operations.

- To the extent that Penelec's management reporting system can be integrated with Met-Ed's accounting systems, centralized cost control would be enhanced.

- The combination will provide the opportunity to integrate the management strengths of the two existing companies and will provide career development opportunities for employees.

Quantifiable savings can also be achieved in the near term through the management combination. The Company's original proposal did not identify the attainment of significant savings as a result of the management combination. The Company in its annual meeting with the Pennsylvania Commission in June, 1980 publicly committed, to achieving $18 million in annual cost savings and cost avoidance in the near future. The Company has stated that $10 million of those annual savings will be in the form of reduced workforce expenses, including payroll, fringe benefits, associated materials and supplies, transportation, office space and other miscellaneous items. The Company expects a 10% reduction in the size of the corporate staff at the time of the combination. These savings need to be individually identified and a schedule prepared for achieving them. Further workforce reductions

are expected to result from the consolidation of division operations and the streamlining of corporate staff functions that will be possible following the conversion to common systems and methods of operation in all functional areas.

The remaining $8 million in ultimate annual savings are expected to be realized through the avoidance of costs. A return to normal operations following the accident at TMI would require additional staff in a number of areas other than generation. The management combination provides an opportunity to return to normal operations without any net additions to staff. Another example of cost avoidance savings is the ability to staff new or expanded functions, such as the implementation of the 10-year Conservation and Load Management Master Plan, at least in part with existing staff. Other types of cost avoidance savings include improvements in labor productivity, customer service, public relations, fuel procurement, and legislative affairs. These improvements would result from the specialized strengths of a combined staff which could not be achieved with two separate staffs. While these savings would be substantial, they are difficult to estimate. The Company's estimate of $8 million in ultimate annual cost avoidance appears to be conservative.

In its original plan, GPU underestimated the resources, time requirements and overall magnitude of implementing the management combination. Considering the other demands on management, the sensitivity of the issue to GPU's many publics, external constraints, and the mechanics of the implementation itself, the original implementation schedule proposed by GPU management was unrealistic. The amount of time needed to consummate the combination and achieve the benefits will probably depend more on the time required to obtain the necessary regulatory approvals than on any other single factor.

Generation

The proposed management combination would permit Penelec expertise to be applied to plant performance improvements at Met-Ed. Penelec's considerable experience in operating coal-fired generation has resulted in the development of relatively sophisticated plant performance monitoring and improvement programs. The application of this expertise to Met-Ed's coal-fired plants should produce significant benefits in the form of improved plant performance and reduced purchased power costs.

The benefits of combining generation organizations need to be quantified. Penelec's Generation group is currently compiling the costs of identified equipment improvements as well as the benefits associated with each as expressed in thermal improvements (reduced BTU/KWH) or forced outage ratios. The dollar values (benefits less cost) of these improvements should be more clearly identified. Similar improvements at Met-Ed's plants could be achieved under the combined management due to the expanded staff capabilities. For example, the recent performance of Met-Ed's Portland station is below that of the average Penelec plant, and could be expected to improve as a result of the combination.

The management combination would merge the Met-Ed non-nuclear generation organization with the Penelec Generation organization to effectively increase coverage of Met-Ed's power plants. This combination would bring additional staff to the generation headquarters in Johnstown. The proposed combined generation organization structure is an enlarged version of Penelec's current organization and as such would not require significant restructuring. With the national emphasis on switching to coal based technology, the importance and size of the generation organization in Johnstown should grow correspondingly.

The proposed combined Generation organization does not provide near term cost savings through reductions in corporate staff. While the combination would have little effect on the staffing at generating stations, some head count reductions might be expected through the elimination of duplicate positions and functions. By maintaining existing staffing levels, GPU expects to improve plant performance. The companies do not currently correlate plant performance improvement with staff additions on a return-on-investment basis. Without such a methodology, it is difficult to make an objective evaluation of staffing requirements.

The future roles of mobile maintenance and project management need to be clarified. Penelec uses roving maintenance crews to augment on-site plant maintenance crews during outages and emergencies. The disposition of these crews, as well as their reporting relationship in the proposed combination, are unclear. Penelec and Met-Ed territories are served by different union locals, so that using the mobile maintenance force concept at Met-Ed's plants may have to be negotiated.

Recent load projections, the potential impact of the 10-year Conservation and Load Management Master Plan, and GPU's financial condition raise uncertainty about GPU's ability to undertake major generating projects in the foreseeable future. While there will be an ongoing need to modify and improve existing facilities, the need for a major project management function requires further analysis.

The role of the proposed combined non-nuclear generation organization may change in the future. The proposed combined generation organization includes what is now the Project Controls function at GPUSC. This function serves all of the operating companies and it is not clear where JCP&L would obtain such support in the future. The fact that the generation organization would be physically separate from the rest of the company may pose problems in coordination, communications, control, and policy adherence. Establishing separate company for fossil generation similar to the proposed GPU Nuclear Corporation might be desirable in the future.

Customer Operations

The majority of employees in the proposed Customer Operations organization would be located in the divisons. These personnel directly affect the level of service delivered to customers. Both Met-Ed and Penelec have

excellent records of performance in customer service, as measured by the numbers of complaints to the PUC and GPU's customer attitude surveys. There is no indication that the proposed combination would have any negative effect on the level of service.

The proposed combination of corporate staffs should enhance centralized control over field operations and could improve the level of service to customers. Both Met-Ed and Penelec offer unique strengths in managing customer operations. Met-Ed's experience in achieving functional control over field operations should help standardize methods of operation and encourage more consistent levels of service. Penelec's strength in budget control should help minimize the cost of field operations.

The effect on the staffing requirements in the operating companies of implementing the 10-year Conservation and Load Management Master Plan needs to be determined. The role and responsibilities of GPUSC need clearer definition with respect to research, program development, administration, advertising, or monitoring. In addition, it is not apparent that organization and staffing requirements for the operating companies were developed as part of the Master Plan. A fifteen-person corporate staff is proposed for Conservation and Load Management in the combined Pennsylvania companies. This organization would have program development, administration, and some research responsibilities.

Of greater concern are the organization and staffing requirements in the divisions. The skills required for Conservation and Load Management most closely resemble those currently possessed by consumer service representatives, of which there are now approximately 100 in the two companies. If the GPU Master Plan called for the present level of effort but with a more focused approach, a separate Conservation and Load Management organization may not be required in the field. Some preliminary estimates of field staffing requirements for implementing the Master Plan call for as many as 240 representatives devoted exclusively to conservation and load management. In view of the ongoing need for service consultation in the field, this would require the addition of over 200 employees. The ability of GPU to financially support the additional employees and the rate treatment given to the Master Plan by the PUC will affect the final implementation plans.

The decision on a proposal to centralize various transmission engineering and construction functions in GPUSC will affect the organization planning for the proposed combination. A proposal to centralize transmission planning, engineering, and construction, as well as some sub-transmission functions in GPUSC for all the operating companies could eliminate the need for an additional 60 to 70 staff in the proposed combined Pennsylvania organization. It would also produce immediate savings in the form of a net cost reduction of some 50 manpower equivalents, across all GPU companies, or about 17% of existing engineering staff. Since the transmission system in fact serves all GPU companies, and particularly because the associated workload is not uniformly distributed over time for any one company, the proposal has both logical and economic value. The timing of implementation, should be coordinated with the proposed combination.

Accounting

Since the two companies would remain as separate legal and financial entities in the proposed combination, consolidation of the accounting staffs is not required in the near term. Separate books, payables, receivables, rates, and legal documents would need to be maintained for the two companies. This situation would require proper coordination and communication on a corporate basis. While financial staffs could be centralized over time, the current status of financial systems in the two companies would complicate the creation of a combined financial staff. While the two sets of systems are generally compatible, and will become more standardized over time, some modifications would be required. While such modifications would not be complex, they may not be economical in light of the near term implementation of various standard systems.

Administrative Services

The benefits of a combined materials management function would be only slightly complicated by the continued existence of separate legal entities. There are potential benefits in further centralization of inventory management and material procurement. While separate purchase orders, invoices, vouchers, and inventory records would have to be maintained, this would not preclude attainment of the operational benefits of the combination. Modifications to the materials management systems would probably be required.

A combined communications organization would improve the timeliness and consistency of the company's response to its Pennsylvania publics. One of the primary qualitative benefits of combining the companies would be to consolidate GPU's legislative, regulatory, media, and public relations efforts in the state of Pennsylvania. The management combination would provide for more consistent and timely responses to its Pennsylvania publics, and would make available a broader set of resources for those responses. This could improve the relationships between the Company and its regulators.

CONSOLIDATION OF DIVISIONS

Division consolidation refers to a streamlining of organization, locations, and methods of operation of personnel in the field. Significant benefits could accrue from a consolidation of division operations. These benefits could be achieved independent of a management combination. A management combination would directly affect corporate staff personnel, but would not necessarily affect personnel in the divisions. The benefits of a management combination could be achieved with no change in division operations. However, there are potential synergistic benefits in coordinating the implementation of a management combination and division consolidation.

GPU has pursued several cost effective methods of operation in the divisions. Over the past several years, both companies have moved toward

consolidating division operations by closing smaller, less efficient operations and centralizing various functions in division or district headquarters. Several district manager positions are vacant in preparation for further consolidation. Although such consolidation could be achieved without a management combination, there are advantages to a more ambitious consolidation program as part of the management combination. A coordinated approach to the consolidation and the combination would be desirable for several reasons:

- The strengthened management team resulting from the combination would be better able to achieve the benefits of consolidation.

- Communicating the consolidation plans as part of the management combination would create a positive impression about GPU's overall plan to restructure its operations.

- The same mechanism could be used for candidate selection and outplacement (if necessary) in both efforts.

- GPU could capitalize on the spirit of change and improve organizational stability.

While the intention to assess the division organizations and configuration is appropriate, efforts to date are insufficient to actually proceed with a consolidation. The opportunities for achieving cost savings through consolidation are substantial, and in fact represented the bulk of the savings associated with the combination as originally proposed by GPU management. The future needs of division operations require further evaluation and a realistic, comprehensive plan of action or schedule for implementation must be prepared. Planning for the consolidation requires more detailed analyses, such as:

- The impact of closing business offices on such factors as customer traffic patterns, transferable workload, and political ramifications.

- Whether existing information systems (CIS and base CAS) would support such centralization at this time.

- Assessing supervisory spans of control; those proposed maybe too broad, particularly for meter reading and line crews in outlying service centers.

- Objective workload analysis, of the type performed by Operations Analysis, for the purposes of calculating staffing requirements.

- A reassessment of the assumption that Consumer Affairs activities should remain geographically dispersed and that functions could not be combined.

- A reassessment of the assumption that the present T&D facilities configuration is appropriate.

- An assessment of the number of qualified staff required to support highly technical functions, such as electrical equipment, if the number of divisions were increased.

There is clearly a need for more in-depth analysis of the consolidation, especially considering the sensitivity of the issue and the large numbers of employees affected. If such analysis is to be meaningful, substantial involvement and contributions from division personnel will be required.

GPU SERVICE CORPORATION

The role and responsibilities of GPUSC are appropriate and offer a number of benefits to the operating companies. The concept of a service company, as it is applied by GPU and other holding companies in the utility industry, is to provide services to the operating companies which are more efficiently and effectively performed on a centralized basis. Some of the more substantial benefits to the operating companies which result from the centralization of functions in GPUSC include:

- Economics of scale in generation planning and construction, financing, and data processing

- The ability to concentrate expertise and take advantage of a greater experience base

- Better coordination and control of corporate and system planning, policy development and administration

Due to the infrequent occurrence of certain activities, better utilization of resources can be achieved by centralizing certain functions for the three operating companies. Other special efforts, such as the Conservation and Load Management Master Plan, become more justifiable when the benefits accrue to three companies, rather than to one. The services provided by GPUSC to the operating companies appear to be cost effective.

The staffing levels in GPUSC are appropriate. While a detailed workload analysis of staffing levels was not performed as part of this study, it appears that GPUSC staffing levels are not out of line with those of other utility holding companies. Roles and responsibilities are documented and generally understood, so that there is little duplication of effort between GPUSC and the operating companies. GPUSC services appear to be provided on a cost effective basis. For example, the data processing and system development functions costs are below average for a utility of GPU's size.

It is unlikely that either the services offered by GPUSC or the nature of the demand for those services would change as a direct result of the proposed management combination. The proposed management combination does

not change the relative roles of the operating companies and GPUSC. It is also unlikely that the combination would affect the current demand for services fom the two separate Pennsylvania operating companies. There are other changes being proposed which affect GPUSC and the operating companies, such as the formation of GPU Nuclear Corporation and the further centralization of transmission and distribution engineering activities. While they are not directly related to the proposed combination, coordination and implementation of any such changes would be desirable.

The proposed changes in GPU's organization as well as some perceived GPUSC needs, indicate that a reassessment of the service company's future role would be appropriate. Since its formation in 1971, GPUSC has evolved to meet the needs of GPU and its operating companies. The proposed formation of GPU Nuclear Corporation, the concentration of non-nuclear generation functions in western Pennsylvania, and the combination of the Pennsylvania operating companies will necessitate changes in the roles and responsibilities of GPUSC.

There are several additional concerns over the roles and responsibilities within GPUSC. For example, the data processing function, which serves all the companies across all functions, may not be optimally located in the financial organization at GPUSC. This location was natural in the past, as most of the early data processing applications were in the accounting and financial areas. However, the data processing function has now reached a size and diversity of user base sufficient to consider separation from the financial organization in GPUSC.

The role played by GPUSC in rate cases of the operating companies may have a negative impact on those proceedings. GPUSC personnel are likely to be seen as outsiders in that process as they are perceived to be only indirectly involved with the operating companies. Development of a rate case strategy and provision of technical support are appropriate functions for GPUSC to perform for the operating companies. By playing a stronger role in rate case management, preparation and presentation, the operating companies could better respond to each state's unique needs.

STRATEGIC RECOMMENTATIONS

TB&A believes that three broad areas of action should be pursued by GPU in the area of organization:

- Management combination of the Pennsylvania operating companies
- Consolidation of Pennsylvania division operations
- Future organizational development of GPU.

THE MANAGEMENT COMBINATION

The management combination should produce substantial benefits for Pennsylvania ratepayers and should be completed. It is clear, however, that continued detailed planning and analysis will be required and that more substantial resources should be devoted to this effort than in the past. Specific activities that should be performed include:

- Develop detailed organizational and staffing requirements for each function.

- Select candidates for key positions and involve them in further organization development and assessment.

- Determine disposition of all current employees, and the timing and logistics of all relocations.

- Establish a task force to coordinate the implementation of the management combination.

- Quantify the specific costs assumed, cost reductions, and costs avoided through the management combination.

- Establish a formal process whereby the achievement of savings can be monitored and the results of the combination evaluated.

- Report implementation status and achievement of savings on a regular basis.

- Study all the major operating systems and methods and procedures, identifying the similarities and differences between the two companies, and then establish a set of common corporate operating systems, methods, and procedures.

- Evaluate the ability of existing management systems to support a combined operation and lay out a timetable for necessary enhancements or upgrades.

- Coordinate workforce management systems between the two companies and continue to monitor staffing levels and needs.

- Establish a formal generation plant improvement program, set performance targets, quantify the dollar benefits of improving performance, and base manpower planning on return-on-investment criteria.

- Assess the potential benefits, costs, and timing of a financial and legal merger of the two companies.

While the Company has begun some of these activities, it is essential to ensure that an objective assessment is made of future organizational needs and that the potential qualitative and quantitative benefits are achieved. With other pressing demands on management's time, it may be difficult for the Company to devote the resources and organizational expertise necessary to implement the management combination in a timely fashion. The special interests and concerns of the Company's publics regarding the proposed changes will also require careful consideration. Barring any unforeseen or regulatory constraints, the additional planning and analysis required to begin implementation would probably take three to six months, and the first phase of relocations could be completed within eighteen months. Other func- tional combinations which required system changes, such as in accounting and materials management, may take as long as five years to complete.

CONSOLIDATION OF DIVISIONS

Considering the substantial potential benefits and the opportunities presented by the management combination to implement other changes, a more detailed analysis of the consolidation of division operations should be performed. This would include:

- A analysis of such factors as customer traffic, transferable workload, and political value in determining the economic viability of business offices.

- An evaluation of the potential for centralizing various activities.

- An assessment of the ability of existing systems (such as CIS, CAS, and COMEC) to support consolidation.

- A determination of the optimal configuration of line crew and service center locations.

- Utilization of Operations Analysis personnel to perform workload analysis and develop staffing requirements by location.

- A determination of the most appropriate organization structure for division operations, addressing supervisory and managerial spans of control, line and staff responsibilities, and the number of divisions and districts.

The involvement of current division personnel would be critical in these analyses and would help ensure a successful implementation. An implementation plan should be developed and coordinated with a similar plan for the management combination. TB&A's experience with other utilities which have consolidated division operations is that the planning and mechanics of consolidation (such as budget and accounting revisions and selection of a management team) take about one year and that complete implementation can be achieved in two to three years.

ORGANIZATIONAL DEVELOPMENT

In light of the significant changes that are being proposed or recommended for GPU's organization structure, a formalized organization planning process should be established to determine the long-term needs and strategy of the Company. The series of historical events and recent developments represent an evolution in GPU's organization toward more centralized control and functional responsibility.

A formalized planning process would develop an organizational strategy, establish future plans, and include periodic reassessment of needs and plans. These plans would assess the current and future roles and responsibilities of each function and examine staffing needs, management succession, personnel evaluation processes, training requirements, and career development plans. Particular attention should be paid to the roles, responsibilities and staffing of the service company. In the near term, consideration should be given to transferring more of the responsibility for rate case management, preparation, and presentation to the operating companies.

SUMMARY OF RECOMMENDATIONS

NUMBER	RECOMMENDATION	PAGE REFERENCE
1	JOINT TASK FORCE	III-27
	a. Establish Task Force	
	b. Analyze the situation	
	c. Assess the options	
	d. Develop plan of action	
	e. Implement plan of action	
2	INTERIM ACTION PLAN	III-28
	a. Convene meeting of GPU Management, Pennsylvania PUC and New Jersey Board of Public Utilities	
	b. Analyze the situation	
	c. Assess the options	
	d. Develop interim action plan	
	e. Implement interim action plan	
3	EMERGENCY PLAN	III-28
	a. Prepare to implement cash reduction and cash flow conservation program	
4	TMI-2 MAJOR COMMITTMENT REVIEW OPTIONS	IV-22
	a. Pursue the restoration of TMI 1 and building of an off-site coal plant or the replacement of TMI 2 with two off-site coal plants	
	b. Develop initiatives to speed up the licensing and building of new coal-fired plants	
	c. Seek Federal assistance for demonstration plants of innovative coal-related technology	

NUMBER	RECOMMENDATION	PAGE REFERENCE
	d. Work with the regulatory authorities to develop rate incentives which accelerate load management and conservation	
5	PLANT AVAILABILITY AND OUTPUT	IV-24
	a. Investigate the potential feasibility of fuel and energy adjustment clauses that specify targets for plant performance	
	b. Develop budgets to achieve the targeted plant performance improvements	
	c. Develop reporting and auditing procedures to permit Commission verification of plant performance improvements	
	d. Expand and pursue the plan of action to optimize non-nuclear plant availability and output through:	
	- Tracking and identifying trends in plant performance indicators	
	- Implementing a comprehensive planned maintenance program	
	- Instituting engineering analysis of equipment history files	
	- Establishing a complete vibration and infrared analysis program	
	- Tightning control procedures on planned outages	
	- Identifying methods for upgrading plant equipment	
	- Developing continuous operator training program	
	- Posting and widely disseminating performance trend information	
	- Establishing a comprehensive program of testing and analyzing specified pieces of equipment	

NUMBER	RECOMMENDATION	PAGE REFERENCE
	- Establishing performance improvement goals	
6	ENERGY OPTIONS STRATEGIC PLAN	IV-25
	a. Develop an energy options strategic plan including an evaluation of:	
	- Regulatory policies	
	- Federal policies	
	- Fuels market factors	
	- Contemplated strategic initiatives	
	- Associated risks and uncertainties	
7	LOAD MANAGEMENT, CONSERVATION AND COGENERATION	IV-26
	a. Crash program for large industrial and commercial customers	
	b. Develop load reduction potential in cogeneration	
	c. Develop mandatory super-insulation standards	
	d. Develop commercial and industrial heat storage and heat recovery applications	
	e. Develop load research data base and analytic tools	
	f. Establish go/no-go milestones for residential load management program and monitor progress	
	g. Centralize load management and conservation responsibility in one organization for the Company	
	h. Upgrade the Company's marketing expertise	
	i. Develop a comprehensive load management and conservation marketing plan	
	j. Monitor progress of PURPA proposal for innovative rate treatment	

NUMBER	RECOMMENDATION	PAGE REFERENCE
	k. Lobby with DOE and FERC for a higher gas curtailment priority for cogenerators	
	l. Lobby with state and federal agencies for our quality regulations that would not discourage coal-fired industrial cogeneration	
8	THE "PENNSYLVANIA SOLUTION"	IV-27
	a. Continue efforts to purchase PP&L capacity on a system-wide rather than plant-specific basis	
	b. Explore other initiatives to lower the costs of energy to its Pennsylvania ratepayers	
	c. Consider advocating the establishment of a Pennsylvania Energy Development Authority to operate federally assisted demonstratition plants for innovative coal generation technology	
9	GPU NUCLEAR CORPORATION ORGANIZATION	V-16
	a. Develop detailed organizational missions, functions and organizational interfaces	
	b. Develop job descriptions and salary ranges	
	c. Select personnel for various positions	
	d. Study space and logistical requirements for the Parsippany Headquarters of GPU Nuclear Corporation	
	e. Document the role and function of the Board of Directors of GPU Nuclear Corporation	
	f. Document the role and function of the Office of the President	

NUMBER	RECOMMENDATION	PAGE REFERENCE
	g. Document the organizational interfaces between the operating plants and the technical functions groups	
	h. Document the relationship between the Nuclear Safety Assessment Group, the General Operating Review Board (GORB), the Generation Review Committee (GRC), and the Plant Operations Review Committee (PORC)	
	i. Document the role of and relationships between the various support functions of GPU Nuclear Corporation and GPUSC	
10	PROJECT CONTROLS	V-17
	Finalize the project controls to be used between Bechtel and GPU during the clean-up effort	
11	METHODS IMPROVEMENT PROGRAM	V-17
	Develop and implement an effective Methods Improvement Program at TMI	
12	PUBLIC RELATIONS	V-18
	Continue to strengthen the Public Relations efforts for GPU Nuclear Corporation	
13	PUBLIC COMMITTEES	V-19
	Coordinate Public Committees for each nuclear facility which will be actively involved in the review of management actions	
14	NRC DELAYS	V-20
	Develop a specific program to communicate the adverse effects of NRC Delays to the Company's various publics, including the Pennsylvania and New Jersey Commissions, state legislatures and governors in order to apply pressure to the NRC to expedite its decision making process through all available means	

NUMBER	RECOMMENDATION	PAGE REFERENCE
15	MANAGEMENT COMBINATION	V-21

Complete the Management Combination of the Pennsylvania companies

a. Develop detailed organizational and staffing requirements for each function

b. Select candidates for key positions and involve them in further organization development and assessment

c. Determine disposition of all current employees, and the timing and logistics of all relocations

d. Establish a task force to coordinate the implementation of the management combination

e. Quantify the specific costs assumed, cost reductions, and costs avoided through the management combination

f. Establish a formal process whereby the achievement of savings can be monitored and the results of the combination evaluated

g. Report implementation status and achievement of savings on a regular basis

h. Study all the major operating systems and methods and procedures, identifying the similarities and differences between the two companies, and then establish a set of common corporate operating systems, methods and procedures

i. Evaluate the ability of existing management systems to support a combined operation and lay out a timetable for necessary enhancements or upgrades

j. Coordinate workforce management systems between the two companies and continue to monitor staff levels and needs

NUMBER	RECOMMENDATION	PAGE REFERENCE
16	CONSOLIDATION OF DIVISION OPERATIONS	V-22

Take the necessary steps to complete the consolidation of division operations of the Pennsylvania companies

a. Consider customer traffic, transferable work load, and political value in determining the economic viability of business offices

b. Evaluate the potential for centralizing various activities

c. Evaluate the ability of existing systems (e.g., CIS, CAS, COMEC) to support the consolidation

d. Determine the optimal configuration of line crew and service computer locations

e. Utilize Operations Analysis personnel to perform workload analysis and develop staffing requirements by location

f. Determine the most appropriate organization structure for division operations

17	ORGANIZATIONAL DEVELOPMENT	V-23

Develop a formalized organization planning process to determine the long-term needs and strategy of GPU for organizational development

a. Develop organizational strategy

b. Establish future plans including:

- Process for periodic reassessment of needs and plans

- Assessment of current and future roles and responsibilities of each function

- Examination of staffing needs

NUMBER	RECOMMENDATION	PAGE REFERENCE
	- Management succession	
	- Personnel evaluation processes	
	- Training requirements	
	- Career development plans	
	c. Consider transferring more of the rate case management, preparation and presentation responsibility to the operating companies	