REPORT BY THE

AUDITOR GENERAL

OF CALIFORNIA

THE CALIFORNIA PUBLIC UTILITIES COMMISSION NEEDS TO IMPROVE ITS REGULATORY CONTROL OF UTILITIES' CONSTRUCTION PROJECTS

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OFFICE OF THE AUDITOR GENERAL

TO THE

JOINT LEGISLATIVE AUDIT COMMITTEE

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August 25, 1982

The Honorable President pro Tempore of the Senate
The Honorable Speaker of the Assembly
The Honorable Members of the Senate and the
Assembly of the Legislature of California

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Members of the Legislature:

Transmitted herewith is the Auditor General's report on the California Public Utilities Commission's Regulation and Control of Utilities Construction Projects. The report was prepared in response to a request by Assemblyman Douglas H. Bosco, Chairman of the Assembly Special Committee to investigate PG&E's Helms Pumped Storage Project. The CPUC is responsible for approving new power-generating facilities and establishing the lowest possible rates that are fair to both consumers and utilities.

The auditors found that the CPUC does not have adequate procedures for approving and monitoring power-generation projects such as the Helms Pumped Storage Project. Thus, the CPUC may not be able to ensure that the costs of constructing projects are legitimate. Further, the CPUC lacks sufficient information to effectively identify unreasonable costs and to review utility requests for increased rates. As a result, utility consumers may eventually pay for construction costs that should not have been included in the rate base.

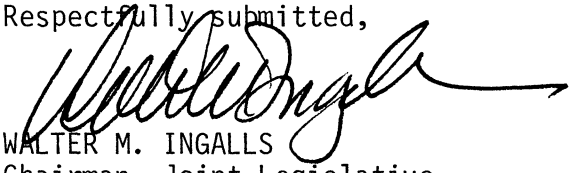
The CPUC conducted limited analysis before approving the Helms Pumped Storage Project and relied on outdated information to assess the need for and the cost of the project. In addition, the CPUC made no effort to ensure that adequate management systems were in place before the construction of the project began. The CPUC also did not develop a process to monitor the construction of the Helms Project. Specifically, the CPUC did not require regular progress reports, and it did not review the project until four years after construction had begun.

Because of these weaknesses in its approval and monitoring procedures, the CPUC did not regularly collect information on project costs, and it lacks assurance that project management systems are adequate. Consequently, it will be difficult for the CPUC to ensure that all costs of the Helms Project were legitimately incurred and thus protect the consumer from improper rate base increases. Although the CPUC plans to review the final costs of the project, such after-the-fact reviews may not be effective in assessing the reasonableness of project construction costs. The CPUC has taken several steps to improve its processes for approving and monitoring utility construction projects; however, additional improvements are needed.

The Helms Project approved in 1976 is scheduled to be producing power in October, 1982. The initial cost estimate of $211 million has escalated to a recent estimate of $738 million. The report concludes that during PG&E's Helms Project rate increase proceedings, the CPUC should obtain sufficient information and examine those factors which may have contributed to cost overruns.

The Commission responds that PG&E will have the burden to prove in Commission hearings that Helms construction costs that it wishes to include in the rate base were reasonably and prudently incurred. PG&E indicates that their application is only a formal beginning of what will be an intensive and arduous process of CPUC data requests, analysis, investigation and adversary hearings.

Respectfully submitted,



WALTER M. INGALLS
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SUMMARY

We have reviewed the California Public Utilities Commission's (CPUC) regulation of utilities' construction projects with specific emphasis on the Pacific Gas and Electric Company's (PG&E) Helms Pumped Storage Project. The CPUC approves and monitors the construction of power-generation projects and adjusts utility rates to reflect legitimate construction and operating costs. The CPUC does not, however, have adequate procedures for approving and monitoring power-generation projects such as the Helms Pumped Storage Project. Thus, the CPUC may not be able to ensure that the costs of constructing projects are legitimate. Further, the CPUC lacks sufficient information to effectively identify unreasonable costs and to review utility requests for increased rates. As a result, utility consumers may eventually pay for construction costs that should not have been included in the rate base.

The CPUC conducted limited analysis before approving the Helms Pumped Storage Project and relied on outdated information to assess the need for and the cost of the project. In addition, the CPUC made no effort to ensure that adequate management systems were in place before the construction of the project began. The CPUC also did not develop a process to

monitor the construction of the Helms Project. Specifically, the CPUC did not require regular progress reports, and it did not review the project until four years after construction had begun. Because of these weaknesses in its approval and monitoring procedures, the CPUC did not regularly collect information on project costs, and it lacks assurance that project management systems are adequate. Consequently, it will be difficult for the CPUC to ensure that all costs of the Helms Project were legitimately incurred and thus protect the consumer from improper rate base increases. Although the CPUC plans to review the final costs of the project, such after-the-fact reviews may not be effective in assessing the reasonableness of project construction costs. The CPUC has taken several steps to improve its processes for approving and monitoring utility construction projects; however, additional improvements are needed.

The effect of the CPUC's project approval and monitoring deficiencies becomes more significant when there are weaknesses in utility project construction that could contribute to increases in the cost of the project. The CPUC's effectiveness is further limited when utility rate increase applications do not clearly discuss factors contributing to project costs. In the case of the Helms Project these conditions did occur. For example, although the civil construction contract adequately protects the interests of both

PG&E and the contractor, it contains certain provisions that may limit the contractor's incentive to control costs. Because of one weakness in the contract, the contractor received his minimum fee almost three years before completing construction of the project. Also, while PG&E established and generally adhered to project control systems, weaknesses in scheduling work, reviewing invoices, and auditing may affect the cost of the project. During the first two years of the project, a comprehensive system for controlling schedules was not in place, nor was the auditing of the contractor's costs and operations adequate. Our review of the contractor's invoices revealed some gaps in the documentation of costs upon which PG&E based the monthly payments to the contractor. Finally, PG&E's application for a rate adjustment contains unclear and incomplete information on the reasons for cost overruns in the Helms Project.

To correct weaknesses in its systems for approving and monitoring the construction of utilities' power-generation projects, the CPUC should develop written standards and procedures for reviewing and approving project applications and for monitoring the construction of utility projects. These procedures should include a method for reviewing the project management systems and the major provisions of civil construction contracts before construction begins. Monitoring requirements should appear in formal, written guidelines, and

they should be a condition of the project's approval. The CPUC should also establish criteria for determining whether the final costs of a project are reasonable.

Finally, during the Helms Project rate increase proceedings, the CPUC should focus on the factors that contributed to increases in the cost of the project. Specifically, the CPUC's review should include an assessment of the unforeseen geological conditions, the delays in the construction schedule, and the performance of the contractor.

INTRODUCTION

In response to a request approved by the Joint Legislative Audit Committee, we reviewed the California Public Utilities Commission's regulatory control of utility companies' construction projects. Specifically, we examined the California Public Utilities Commission's regulation of the Helms Pumped Storage Project, an electricity-generating facility currently being constructed by the Pacific Gas and Electric Company (PG&E). We evaluated the management systems used by both the California Public Utilities Commission and PG&E to approve, monitor, and control the construction project, and we reviewed the process for adjusting rates to reflect the costs of the project. We conducted this review under the authority vested in the Auditor General by Sections 10527 through 10528 of the Government Code. Further, we conducted our review in accordance with generally accepted governmental auditing standards necessary to accomplish the work requested by the Legislature.

BACKGROUND

This section will discuss the responsibilities of the California Public Utilities Commission and describe the Helms Pumped Storage Project.

The California Public Utilities Commission

The California Public Utilities Commission (CPUC) is responsible for regulating privately owned public utilities and transportation companies. The objective of the CPUC is to ensure that safe and adequate gas, electric, telephone, water, and transportation services are available to consumers at the lowest possible rates that are fair to both the consumer and the utility. Rates must reflect the reasonable costs of a utility's operations and include a fair rate of return on a utility's investment.

The responsibilities of the CPUC are described in Article XII of the California State Constitution XII and in the Public Utilities Code, Section 201, et seq. These responsibilities include setting utility rates, approving the operations of utilities, and monitoring utilities' operations for safety. The CPUC also holds hearings to resolve consumers' complaints and to review subjects related to regulating utilities.

Two of the CPUC's major responsibilities are approving new power-generating facilities and establishing rates to reflect the costs of constructing and operating such facilities. Before beginning construction, a public utility must apply for and receive the CPUC's approval of the project.

CPUC staff review the documentation in the utility's application. As part of the review process, the CPUC may hold public hearings to allow interested parties to comment on the project. At these hearings, members of the CPUC's staff, representatives of the utility, and other groups may provide evidence or testify about the project. The CPUC may waive public hearings if it determines that they are unnecessary. The CPUC may also place restrictions or conditions on the construction of a project. These conditions may involve requirements for submitting data on capital costs. Recently, the CPUC began requiring utilities to submit information on a project's construction progress. Once the CPUC approves the project, it issues a Certificate of Public Convenience and Necessity, and the utility can begin construction.

After completing project construction, a utility may apply to the CPUC for a rate adjustment to recover the costs associated with owning, building, and operating the project. The CPUC reviews and approves rate adjustments by conducting one of two types of hearings: either a "general rate case proceeding" or a "rate base offset proceeding." In a general rate case proceeding, a utility includes the costs of a project in its biennial request for a rate review. The costs of a project constitute only one of many categories of expenses that

the CPUC must analyze and approve. The project construction costs that the CPUC finds to have been reasonably incurred are added to the utility's rate base.*

In the past, a utility could adjust its rate base during a general rate case proceeding. However, if the costs of a project are high, a utility may need to recover construction and operating costs more quickly than is possible under such a proceeding. To handle these cases, the CPUC has begun using a new process called a "rate base offset proceeding." Using this method, a utility may apply to adjust its rate base to reflect the costs associated with a single project. This type of proceeding allows the utility to recover expenses more promptly, and it also permits the CPUC staff to review the costs of a project more comprehensively. This review involves an analysis of final project costs and an evaluation of the prudency of project expenditures.

Section 451 of the Public Utilities Code requires utility rates to be just and reasonable. Therefore, regardless of which proceeding a utility selects, the utility must prove

* A utility's rate base is the dollar value of a company's plant, equipment, and intangible capital used in serving the public, i.e., invested capital minus accrued depreciation. A utility may earn an authorized rate of return (expressed in a percentage) on this rate base to pay for the cost of invested capital.

that the project costs to be added to the rate base are reasonable. Since adjustments in the rate base generally affect the rates charged by the utility, the CPUC must ensure that project costs added to the rate base are also just and reasonable. The CPUC views "reasonable costs" as those incurred expenses that are proper, prudent, and fair. The CPUC does not regard costs resulting from management errors or from inefficiencies to be reasonable, and such costs may not be added to the utility's rate base.

The Helms Pumped Storage Project

In June 1976, the CPUC granted a Certificate of Public Convenience and Necessity to the Pacific Gas and Electric Company for a large hydroelectric project called the Helms Pumped Storage Project (Helms Project). The project, located 50 miles east of Fresno in the Sierra National Forest, is one of the biggest projects of its kind in the world; its three reversible pump-turbines are among the largest in use.

The Helms Project combines conventional hydroelectric generation with pumped storage operations. The project involves dropping water from a higher lake to a lower lake through a system of tunnels. To produce power during peak demand times, the project directs water through an underground

powerhouse containing three reversible pump-turbines. During times of low demand for electrical power, the project pumps water back up to the higher lake so the water can be used again.

Two existing reservoirs, Courtright Lake and Lake Wishon, provide the water for generating power. Courtright Lake is located approximately 1,600 feet above Lake Wishon. Since the combined water storage capacity of these two reservoirs is over 240,000 acre feet, the project can generate power longer than most pumped storage projects can. The Helms Project alone will provide 1,146 megawatts of dependable generating capacity to the PG&E power system.

According to the PG&E project manager, the Helms Project will use available water and energy effectively. Hydrologic conditions, demands for electricity, and economics will determine how much pumping or generating will occur at any given time. PG&E plans to use the Helms Project as a large peak demand resource, an approach that will, according to the company, save fuel costs.

To build the Helms Project, PG&E issued several contracts and developed a management system to monitor and control the civil construction work. In 1977, PG&E awarded the major contract, for the civil construction work, to the

joint-venture group of Granite-Ball-Groves. Although the work was initially bid on the basis of a fixed-price contract, Granite-Ball-Groves submitted an alternative proposal to perform the work on the basis of a cost-reimbursable, incentive-fee contract. (Chapter II of this report details the provisions of this contract.)

PG&E also developed management systems to coordinate and monitor the performance of the various contractors; these systems were intended to ensure that contractors complied with the terms and conditions of their contracts so that the project would be completed on schedule and at a reasonable cost. The details of these management systems are described primarily in project manuals and instructions that pertain specifically to the Helms Project. The project manager, based in San Francisco, has overall management responsibility; he reports directly to PG&E's upper management. A project superintendent at the construction site coordinates all phases of the project's progress, organization, and administration.

During construction the Helms Project has experienced cost increases and schedule delays. The initial estimated cost of the major construction work was $211 million in 1973. This estimate was revised in 1977 to $381 million. The current estimate is $738 million. The operational date of the project's first unit, initially scheduled for June 1981, is

now scheduled for October 1982. As a result of these and other problems, the Helms Project has been reviewed by the CPUC and the State Energy Resources Conservation and Development Commission and has been investigated by the media. The CPUC, in a preliminary report issued in December 1981, criticized the cost-reimbursable contract and found problems in project management. The State Energy Resources Conservation and Development Commission questioned the economic feasibility of the Helms Project. Newspaper and television reports have alleged theft and problems with worker safety.

SCOPE AND METHODOLOGY

Our review focused on the effectiveness of the CPUC's control of utility companies' construction of power-generation projects. Specifically, we examined the CPUC's systems for approving and monitoring the Helms Project and the CPUC's process for adjusting utility rates to reflect the costs of constructing and operating this project. We also reviewed the civil construction contract and the management systems used by PG&E to construct the Helms Pumped Storage Project.

In conducting this examination, we interviewed personnel at the CPUC and reviewed records and documents related to utility projects. We also contacted the State Energy Resources Conservation and Development Commission, the

Federal Energy Regulatory Commission, and state utility commissions in New York, Wisconsin, Missouri, North Carolina, and Illinois to compare regulatory systems.

At PG&E, we reviewed records and documents related to the planning, contracting, and building of the Helms Project. We interviewed personnel both at PG&E's San Francisco headquarters and at the Helms Project site. We tested construction management systems and reviewed documents related to the request for an offset of the rate base for the Helms Project. Additionally, we hired Harza Engineering Company, an engineering consulting firm, to evaluate the civil construction contract awarded for the Helms Project. Harza reviewed only the provisions of the contract and did not review any other information associated with the project.

We did not evaluate the need for or the economic feasibility of the Helms Project. Instead, we focused our review on the CPUC and its systems for regulating utility projects, specifically in regard to the application of these systems to the Helms Project. Although we reviewed the factors that have contributed to cost increases at the Helms Project, we did not determine precisely how much each factor increased the cost of the project. In addition, we did not perform tests necessary for expressing an opinion on the internal accounting controls of PG&E or the Helms Project as a whole.

Chapter I discusses the CPUC's systems for regulating power-generation projects. Chapter II analyzes the civil construction contract of the Helms Project, the project management systems, and PG&E's application for a rate adjustment based on the construction costs of the Helms Project. Chapter III provides our conclusion and recommends actions that the CPUC can take to improve its regulatory control of utilities' construction projects.

CHAPTER I

THE CALIFORNIA PUBLIC UTILITIES COMMISSION NEEDS TO IMPROVE ITS REGULATORY CONTROL OF UTILITIES' CONSTRUCTION PROJECTS

The California Public Utilities Commission is responsible for regulating the construction of utility companies' power-generation projects. In carrying out these regulatory responsibilities, the CPUC approves projects, may monitor their construction, and adjusts utility rates to reflect the legitimate costs of constructing and operating these facilities. However, the CPUC's procedures for carrying out these regulatory responsibilities are weak. Consequently, the CPUC is unable to identify effectively, and then delete from the rate base, those costs that may have been imprudently incurred because of problems in a utility's management of a project. As a result, utility consumers may eventually pay for construction costs that should not have been included in the rate base.

Our review of the CPUC's process for approving the Helms Pumped Storage Project (Helms Project) revealed a limited effort to assess both the economic feasibility of and the need

for the project. The CPUC conducted an inadequate analysis before approving the project and relied on outdated information contained in PG&E's application. In addition, the CPUC made no effort to ensure that management systems were in place before construction began. Consequently, the CPUC had no assurance that the Helms Project was necessary or that construction costs would be controlled by effective management systems. The CPUC has improved its system for approving new projects; however, it has not developed standard procedures for this system.

Furthermore, the CPUC did not establish a process for monitoring the construction of the Helms Project. The CPUC did not require PG&E to submit progress reports or information about costs during construction, and the CPUC did not review the progress of the project until 1981, four years after construction began. Consequently, the CPUC lacks sufficient information to determine whether the costs incurred in constructing the Helms Project were reasonable. The CPUC has recently begun monitoring the construction of several new utility projects in order to gather sufficient data for rate increase proceedings associated with these projects.

As a result of weaknesses in project approval and monitoring, the CPUC has little assurance that the costs of the Helms Project were reasonably incurred and that PG&E's application for a rate increase adequately reflects those costs. Therefore, the utility consumers may not be sufficiently protected from unreasonable increases in utility rates.

THE CPUC'S PROCEDURES FOR APPROVING PROJECTS ARE INADEQUATE

The CPUC needs to improve its procedures for approving new power projects. The CPUC lacks specific written procedures and criteria for reviewing and analyzing utilities' applications to build new projects. In addition, a lack of coordination exists between divisions that may participate in the approval process. Consequently, the CPUC cannot ensure that all new projects are necessary, economical, and in the best interest of the utility consumer.

Our review of the approval process for the Helms Project revealed that the CPUC insufficiently analyzed the application and used inadequate data to assess the need for the project and its estimated costs. In addition, the CPUC did not review the adequacy of the contract for the construction of the Helms Project or the adequacy of the project management systems before approving the project. CPUC staff analysts told us that these weaknesses existed, in part, because applications for new power projects were not subject to a comprehensive review in 1976, when the CPUC reviewed and approved the Helms Project. Up to that time, major projects had generally been built according to estimated costs. The projects were therefore less controversial and did not warrant the extensive reviews that current projects warrant.

Although the CPUC has improved its procedures to include more extensive analyses of utilities' applications for new projects, weaknesses still exist in the process for approving applications. Specifically, the CPUC still lacks written procedures and standards for reviewing utilities' applications, and the CPUC's divisions inadequately coordinate their various approval efforts.

The CPUC's Project Approval Process

Since 1970, the CPUC's internal regulations have required that, before a plant generating over 50 megawatts can be constructed, the CPUC must find that the facility is "necessary to promote the safety, health, comfort, and convenience of the public," and that it is "required by the public convenience and necessity." The CPUC must also consider the impact of such a facility on the environment. Further, CPUC regulations (Title 20, California Administrative Code, Sections 17.1 and 18) require the utility to include specific types of information in its application for approval of the proposed project. This required information concerns the need for the project, safety plans, estimated costs, details about the design and site of the project, environmental factors, and the projected demand for the electricity.

Although the law does not require the CPUC to conduct specific reviews of project applications, CPUC officials in charge of approving projects told us that the CPUC is implicitly required to review the information contained in a utility's project application. CPUC analysts further stated that since their principal responsibility is to ensure fair and reasonable utility rates, the project approval process should work toward that goal. Therefore, in reviewing an application for project approval, the CPUC may perform any type of analysis it considers necessary or appropriate to fulfill its mandate.

Weaknesses in the CPUC's Approval Process

The CPUC's approval of the Helms Project exemplifies the weaknesses in the CPUC's process for approving utilities' new power projects. Our review revealed that the CPUC conducted only a very limited review of the Helms Project before approving the application. The CPUC's major analytical effort was compiling information for an Environmental Impact Report. As part of this report, the CPUC presented a limited assessment of the need for the Helms Project. The assessment included the CPUC's and PG&E's forecasts for peak energy demand and growth rates for 1978, 1981, and 1984. The CPUC also compared the cost of the Helms Project's hydroelectric turbines to the cost of gas turbines, an alternative energy source. The CPUC conducted no other reviews of the Helms Project

application. The CPUC did not ensure that the contract for the Helms Project contained adequate provisions for project control, and it did not ensure that PG&E had project management systems in place to control costs, schedules, and the quality of construction for the Helms Project.

In addition to performing only a limited review of the Helms Project application, the CPUC did not assess the accuracy of the information contained in PG&E's application. Specifically, the CPUC relied on inadequate or outdated information concerning the need for and the cost of the Helms Project. Between the time that PG&E applied for approval of the project in 1973 and the time that the CPUC granted approval in 1976, actual peak electrical demand increased by 13.8 percent, less than the 18.3 percent increase that PG&E had forecasted in its 1973 application.* In 1982, a State Energy Resources Conservation and Development Commission staff report concluded that PG&E justified the Helms Project in its application for approval by using growth rate forecasts that never materialized. Specifically, the State Energy Resources Conservation and Development Commission concluded that "PG&E's forecasts of future system demand were significantly in error" and that "this was evident as Helms was beginning

* We calculated actual peak electrical demand using data from the State Energy Resources Conservation and Development Commission.

construction...." If the CPUC had obtained data on actual peak electrical demand in 1976, it could have updated its forecast of energy demand. Thus, it could have more accurately assessed the need for the project.

The CPUC also relied on the cost estimate included in PG&E's 1973 application. In 1976, however, by the time the CPUC approved the Helms Project, the estimated cost of the project had already increased from $234 million to at least $362 million. Yet, despite the three years between the application and the approval, the CPUC did not request a revised cost estimate from PG&E. Therefore, the CPUC based its approval of the Helms Project on an obsolete cost estimate. One CPUC analyst who was in charge of approving the Helms Project stated that he would have been concerned about the cost of the project and may have conducted an additional review of the Helms Project if he had known how much the estimated cost had increased.

According to CPUC analysts who approve projects, the CPUC did not extensively review the Helms Project because projects in the past were smaller in scope, constructed within estimated costs, and therefore less controversial. Consequently, applications for project approval were not comprehensively reviewed. Furthermore, the CPUC had no written criteria specifying the process for analyzing applications for

new power-generation projects. Because the CPUC did not thoroughly review the Helms Project before approval and because it relied on outdated information, it did not adequately fulfill its responsibilities to review and approve proposed power-generation projects.

The CPUC's Current Approval Process

In addition to reviewing the CPUC's specific process for approving the Helms Project, we examined the CPUC's system for approving recent projects. The CPUC still has no written procedures for reviewing projects. Also, the divisions within the CPUC that may participate in the approval process do not effectively coordinate their efforts. Although weaknesses continue to exist, the CPUC has improved its system for approving new projects.

To evaluate the changes in the CPUC's procedures since its approval of the Helms Project in 1976, we reviewed the CPUC's 1982 approval of the Southern California Edison Company's Balsam Meadow Hydroelectric Project. The Balsam Meadow Project is located in Fresno County and will provide about 200 megawatts to Southern California Edison Company's generating capacity. The Balsam Meadow Project is the only hydroelectric project to come before the CPUC for approval since the Helms Project.

In reviewing the CPUC's approval of the Balsam Meadow Project, we found that the CPUC still has no written procedures for determining the nature and extent of the review it should perform before granting approval. The CPUC's lack of procedures is in contrast to the California Energy Commission's specific requirements for analysis and criteria for approval contained in the Warren-Alquist State Energy Resources Conservation and Development Act of 1982.

Additionally, the CPUC divisions that may participate in the approval process do not adequately coordinate their efforts. For example, in approving the Balsam Meadow Project, the Utilities Division assessed the need for and the environmental impact of the project, while the Revenue Requirements Division conducted a cost analysis. However, the project manager in charge of coordinating approval efforts was not aware of the Revenue Requirements Division's cost analysis until it was presented at a hearing.

The Director of the Utilities Division told us that the CPUC does not need written procedures for approving new projects because it does not expect any large plants to be built in the near future. He further stated that utility resource plans currently show no intentions of constructing facilities like the Helms Project or the Balsam Meadow Project. Nevertheless, because the CPUC lacks written procedures for

approving projects and because inadequate coordination exists between its divisions, utilities' power-generation projects may not be adequately reviewed before they are approved.

Along with these weaknesses, however, we found two improvements in the CPUC's process for approving applications. One improvement is that the CPUC conducted a more extensive assessment of the need for and the cost of the Balsam Meadow Project than it conducted for the Helms Project. The CPUC's assessment of the Balsam Meadow Project included an analysis of Southern California Edison's energy demands, an analysis of the effect of the project on displacing oil-fired facilities, an assessment of the project's reliability, and an estimation of the project's effect on utility rates.

The CPUC's cost analysis included a review of Southern California Edison's budget and procurement processes, cost estimates, and control procedures; an assessment of the project's cost-effectiveness; and a comparison of the revenue requirements of the Balsam Meadow Project with those of an alternative method of generating power. The CPUC also reviewed the project management systems.

A second difference in the CPUC's approval process is that the approval of the Balsam Meadow Project includes incentives for the utility to operate efficiently. In its June

1982 interim decision on the Balsam Meadow Project, the CPUC recognized that cost overruns could affect the cost-effectiveness of the project. The CPUC told Southern California Edison that unless it could show that higher costs were reasonable, only the cost estimate used to justify the project would be added to the rate base. The CPUC's decision also required Southern California Edison to report project costs periodically; CPUC staff would review these reports.

THE CPUC'S MONITORING OF PROJECT CONSTRUCTION IS LIMITED

Historically, the CPUC has not monitored the construction of utilities' power-generation projects because these projects did not have large cost overruns and were therefore not controversial, because projects were not large in scope, or because monitoring was considered to be an infringement on the management of the utilities. As a result, the CPUC conducted limited monitoring of PG&E's Helms Project. However, because monitoring was limited, the CPUC may lack sufficient information to determine whether the costs incurred during the construction of the Helms Project were reasonable.

Although the CPUC is not specifically required to monitor utilities, its mandate is broad, providing it with the flexibility to monitor a utility if it believes such monitoring is necessary. Even so, the CPUC hesitated to implement a monitoring program for several reasons. Primarily, the CPUC believed that monitoring was not necessary. CPUC analysts stated that only recently, with rising energy costs, inflation, and cost overruns, has there been a concern about monitoring. Because projects in the past were generally built within cost estimates, the CPUC believed it could determine which costs were reasonable to pass on to the utility consumer without being involved with the project during its construction. Thus,

the CPUC generally has had no involvement with construction projects from the time it approved them to the time the utility applied to have project costs added to the rate base.

In addition, the CPUC has been concerned about the distinction between monitoring and managing a utility project. Some CPUC officials expressed concern that a utility may interpret certain monitoring activities by the CPUC as an attempt to manage a project. Although the CPUC has the authority to monitor, a 1950 Supreme Court decision prevents it from managing a utility.

Limited Monitoring of the Helms Project

After approving the Helms Project for construction in 1976, the CPUC did not require PG&E to submit any construction progress reports or updated information about the cost of construction. Furthermore, CPUC officials told us that the CPUC did not obtain or review the monthly reports that PG&E submits, as required, to the Federal Energy Regulatory Commission. These reports contain recent information on the construction and costs of the project.

In response to allegations appearing in the media, the CPUC directed its auditing and engineering staffs to review the Helms Project in 1981. However, by the time the review was

published in December of 1981, the project was approximately 80 percent completed. The CPUC's review team concluded that PG&E's management and control of the Helms Project did not fully protect the interests of the consumer. The CPUC review team further stated that the Helms Project had not been reasonably managed and that consumers should not have to pay for the total costs of the project. In addition, the review team reported that project monitoring was needed because it was difficult to evaluate management decisions after-the-fact. The CPUC stressed that this was a preliminary review and that it would prepare a final report during the rate adjustment proceeding.

Because the CPUC did not monitor projects during the course of construction, it lacks sufficient information to determine which costs were reasonably incurred. Moreover, during the rate adjustment process, the CPUC must attempt to evaluate management efficiency and project costs after the fact instead of reviewing them during construction. This evaluation may not be effective in identifying, then deleting from the rate base, those costs improperly incurred by the utility.

An effective monitoring program should provide a means for gathering information during a project's construction and for identifying factors that cause delays or increased

costs. The monitoring effort might be limited or extensive depending upon the reporting requirements that the CPUC would impose on projects, and the potential that adequate information might not be available, after construction, for the CPUC to assess the reasonableness and prudency of project costs.

Monitoring Activities of Other Government Agencies

The federal government and other state utility commissions monitor the construction of utilities' power-generation projects. The Federal Energy Regulatory Commission requires utilities to submit monthly progress reports that include revised estimates of construction costs. In addition, the Federal Energy Regulatory Commission's staff visit sites to ensure that utilities comply with the federal license that they must obtain before beginning construction.

We contacted the utility commissions of five other states that have recently begun to monitor construction projects. To monitor construction costs and identify management inefficiencies, Missouri's utilities commission uses data from management and financial audits conducted by both the commission and the utility. The commission in New York monitors costs and also has two staff members who oversee progress at the project site. When setting utility rates, the commission may consider recommendations for correcting

inefficiencies that were identified through monitoring. Wisconsin's commission conducts on site reviews throughout the construction of a project, and the North Carolina commission requires quarterly reports on construction progress and costs. The Illinois commission also requires monthly status reports during the construction of a nuclear plant. These examples show that other states and the federal government have recognized the need to monitor the construction of utilities' projects and have recently instituted project monitoring systems.

The CPUC's Current Monitoring Plans

The CPUC recently recognized the need for a program to monitor and assess the costs of projects. Management of the CPUC believes that such a program will help determine which costs associated with project construction may be reasonably included in the rate base. In November of 1981, the CPUC formed the Project Cost Assessment Task Force in response to the controversy surrounding the Helms Project and other large construction projects. The task force is supposed to recommend procedures for analyzing costs during the project approval process, for monitoring costs during project construction, and for answering questions about costs in rate base proceedings. This task force has prepared a series of memoranda recommending

a monitoring program and improvements in the process for approving projects. The suggestions have been sent to a CPUC management committee for review.

In addition, as a result of recent CPUC decisions, the executive director is now required to develop programs for monitoring the costs of certain projects. The CPUC also submitted a Budget Change Proposal for 1982-83 requesting four additional staff members to monitor the construction costs of key projects. In its proposal, the CPUC states that without such monitoring it is unable to evaluate construction expenses thoroughly, and improper costs may be included in the rate base. Although the Legislature denied the Budget Change Proposal, staff from the CPUC now perform some monitoring.

The Executive Director of the CPUC believes that a project monitoring program would involve significant costs beyond those currently budgeted for. Moreover, heavy workload in other CPUC responsibilities may place project monitoring at a lower priority than the CPUC would desire.

THE CPUC'S RATE ADJUSTMENT PROCESS MAY FAIL TO IDENTIFY UNREASONABLE PROJECT COSTS

As a result of weaknesses in its procedures for approving and monitoring the construction of utilities' power-generation projects, the CPUC may lack adequate information to assess the reasonableness of project costs during the rate adjustment process. Because its review of costs takes place after construction has been completed, the CPUC may be unable to identify and delete costs that are unnecessary or that have been incurred as a result of inadequate management. The CPUC, therefore, has little assurance that project costs were reasonably incurred and that rate increase applications accurately reflect these costs. Consequently, the utilities may be authorized to earn a return on capital invested in construction expenses even if portions of these expenses are imprudent or excessive.

According to CPUC staff, the CPUC has traditionally assumed that utility companies make prudent decisions, and the CPUC has generally passed on most project costs to the utility consumer without extensive review. We asked the CPUC to provide us with the names of past construction projects for which it did not allow associated costs to be added to the rate base. It provided us with eight cases in which project costs

were disallowed, but our analysis indicated that only one of these cases resulted in the disallowance of unreasonably incurred costs after completion of construction.

In carrying our their role to balance the interests of the ratepayers with those of the utility, some CPUC officials are concerned about the financial effect on a utility of disallowing construction costs. One example that illustrates this concern involved costs associated with an abandoned power plant. In their report to the CPUC on this plant, the CPUC staff stated that if certain expenditures were not included in the rate base, "the ability of [the utility] to meet the minimum financial criteria necessary to attract capital at reasonable rates and to support its credit would be materially jeopardized." In deciding to allow certain costs, the CPUC stated, "We are...concerned with the increasing burden being placed on the stockholders who in the past invested in utility stocks as a reliable income stock with some growth possibilities and with very little risk."

According to CPUC staff, proposed additions to the rate base resulting from the Helms Project, the Diablo Canyon Nuclear Generating Station, and the San Onofre Nuclear Generating Station will all be reviewed in rate base offset proceedings soon. The Helms Project will probably be the first of these plants to become operational and therefore the first

to be considered in a rate base offset hearing. The utilities' estimated additions to the rate base for each of these facilities are as follows: $738,478,000 for the Helms Project, $1,515,587,000 for the San Onofre Project, and $1,190,393,000 for Unit 1 of the Diablo Canyon Project.* The project costs of electrical power plants currently in the rate base are estimated to exceed $14 billion. This total will increase substantially if the above estimated additions become part of the rate base.

According to CPUC officials, rate base offset proceedings have taken place only on a small scale. The CPUC has never had to perform an in-depth review of costs, and it has no written procedures for such a review. The three facilities mentioned earlier will be the first of their magnitude to be considered in this type of proceeding, and the CPUC is attempting to design a method for reviewing the large and controversial rate increase applications.

Plans for a hearing on the Helms Project to adjust PG&E's rate base are currently in a preliminary stage. The CPUC staff have suggested conducting the rate base offset proceeding in two phases. The first phase would involve an

* These amounts may vary when final reviews and adjustments are made by the CPUC and utility companies.

interim decision to add the operating costs of the Helms Project to the rate base, subject to refund after the second phase. In the second phase, the CPUC would determine how much of the total cost of the project was reasonably incurred and should thus be added to the rate base. CPUC officials stated that PG&E has applied to have all project costs for the Helms Project added to the rate base.

Several CPUC officials feel that determination of "reasonable costs" is largely a matter of individual judgment and that the definition of "reasonable costs" varies greatly from case to case. Consequently, CPUC staff are currently developing procedures to review the costs for the Helms Project, and the CPUC may hire private consultants to assist the CPUC staff in this phase of the rate base offset proceeding. However, even with the assistance of consultants, the CPUC will have difficulty determining which costs were reasonably incurred because it did not analyze the adequacy of the project management systems during the approval process and because it did not monitor the construction of the Helms Project. In Chapter II we discuss further the application for a rate increase for the costs of the Helms Project, and in Chapter III we provide our recommendations pertaining to this issue.

CHAPTER II

PACIFIC GAS AND ELECTRIC COMPANY'S HELMS PUMPED STORAGE PROJECT

As discussed in Chapter I, the California Public Utilities Commission may have difficulty determining whether a utility's construction costs are reasonable after the completion of a project because of deficiencies in the CPUC's systems for approving and monitoring projects. Consequently, the CPUC may not be able to effectively identify and delete from the rate base those costs that were improperly incurred. The CPUC's regulatory effectiveness may be further reduced when there are weaknesses in the construction of utility projects that could affect the final cost of a project. In addition, it becomes even more difficult for the CPUC to protect utility customers when rate increase requests do not clearly discuss project costs and reasons for cost overruns. In the case of the Helms Project, we found weaknesses in the civil construction contract and the project management systems, and we found that the information submitted by PG&E to justify project costs does not thoroughly portray or analyze costs.

This chapter analyzes the Helms Project civil construction contract, the management systems used to control the construction of the project, and PG&E's rate adjustment request.

THE CIVIL CONSTRUCTION CONTRACT

Our consultant, Harza Engineering Company, found that the features of the Helms Project cost-reimbursable, incentive-fee contract were reasonable and adequate to control project costs. The contract's provisions were consistent with other cost-reimburseable type contracts and most provisions were well-defined. However, the consultant found weaknesses in the contract that may reduce the contractors' incentive to control costs. Specifically, the contract's provisions for a monthly base fee payment were unclear, and the amount of the minimum fee was too large in relation to the amount of the base fee. Our own review of the contract substantiated our consultant's findings. As a result of these weaknesses in the contract, the contractor's incentive to control costs may have been substantially reduced when over half of the project remained to be built.

Our consultant also stated that the form of a contract used on any project is rarely the cause of cost overruns. Generally, other factors, such as the size and complexity of the project and the adequacy of the administration of the contract, determine whether costs will be controlled. With a cost-reimbursable contract, strong

management controls should be in place to monitor and control costs, to audit the costs of the project, and to review the expenditures of contractors.

Provisions of the Helms Project Civil Construction Contract

Generally, a cost-reimbursable contract differs from a fixed-price contract in that a fixed-price contract provides for a lump sum ("fixed-price") to be paid to the contractor for the timely delivery of an end product or a defined service. The fixed-price contract places most of the risk of unforeseen costs on the contractor, but the costs of changed conditions are often recoverable even under fixed-priced contracts. A cost-reimbursable contract may minimize risks to the contractor when the costs of performance are uncertain. Typically, cost-reimbursable contracts are used when work requirements are not completely defined and work can be described as "state-of-the-art." In the case of the Helms Project, PG&E felt that the conditions of the work necessitated use of this form of contract. In addition, PG&E officials indicated that they were optimistic that the work could be performed for less than the fixed-price bids that they had received.

The civil construction contract for the Helms Project requires PG&E to reimburse the contractor on a monthly basis for all allowable costs incurred during the construction of the

project. These costs may include materials, equipment, labor, and supplies. The monthly payment to the contractor includes an amount to cover payroll at the contractor's home office, an amount for accounting and administration, and a fee to cover corporate profit and overhead.

For constructing the Helms Project, the contractor may earn a base fee of $18 million. However, this fee is subject to adjustments that reflect the contractor's efficiency in controlling costs. That is, if the final actual cost of the civil work exceeds a target cost, the contractor and PG&E share the costs of these overruns up to $2.5 million.* Regardless of the amount of target cost overruns, however, the contractor's fee cannot be reduced below a minimum fee of $15.5 million. If the actual final costs are below the target cost, the contractor and PG&E share the savings with no limit on how much additional fee the contractor can earn above the $18 million base. This provision of adjusting the fee upward or downward

* The target cost is the cost of building a project according to the specifications in the original bid, including approved work changes and additions, and allowances for increases in wages, costs of materials, and costs of energy. It does not include profit, overhead, or the cost of items not in the specifications. The target cost typically differs from the actual cost. The civil construction contract for the Helms Project computes target cost by combining the following: (1) 80 percent of the amounts contained in contractor's initial bid proposal, (2) additions for additional work and inflation in wages and materials, (3) insurance costs, and (4) other direct costs.

depending on the contractor's ability to control actual costs is designed to encourage the contractor to control actual costs by giving the contractor the opportunity to earn more profit and by reducing the profit if costs are not controlled.

The civil construction contract also provides for negotiating of an increase of the contractor's base fee if any one of three conditions occur: if the time of completion extends 9 months past the specified date of completion of February 1, 1981; if authorized contract and field change orders exceed 15 percent of the final target cost; or if the final target cost exceeds $175,000,000. These provisions permit the contractor to renegotiate the base fee to provide for changes in the scope of the project caused by unforeseen conditions, increased costs resulting from inflation and delays, and problems beyond the control of the contractor.

Review of the Helms Project Contract

Our consultant found the provisions of the Helms Project's civil construction contract to be adequate for controlling costs and consistent with other cost-reimbursable contracts. However, one provision was not clearly defined, and another may reduce the contractor's incentive to control actual costs.

The consultant found that the provisions for determining the target cost and the actual cost of the project were reasonable and well-defined. These provisions conform to the intent of a cost-reimbursable, incentive-fee contract, and they provide a clear description of costs. In addition, the contract adequately provides for any increase in the scope or duration of the project necessitated by factors beyond the control of the contractor. This flexibility allows PG&E to deal with unforeseen conditions and helps to minimize potential adversary relationships with the contractor. In addition, the contract permits fee renegotiation if certain conditions occur.

The contract does not, however, clearly define the provision for the monthly payment of the minimum fee. The contract states that a portion of the fee will be paid every month based upon the percentage of the job completed. However, the contract does not specify the meaning of "percentage of job completed," and the fee could be paid on the basis of actual costs incurred or on the basis of progress toward target cost. Our consultant stated that monthly payments under a cost-reimbursable contract should not be based on actual costs incurred but instead on the progress toward meeting the target cost. If the monthly payment is based on actual costs, the contractor could receive the full minimum fee earlier than

necessary. In this situation, the contractor's incentive to control costs may be reduced at too early a stage in the project.

Our review of project records showed that early payment of the full minimum fee in fact occurred with the Helms Project. The fee was paid on the basis of actual costs incurred in accordance with an agreement between PG&E and the contractor, reached after the contract was awarded. The full minimum fee was paid to the contractor in December of 1979, almost three years before the current estimated date of completion. Receiving the full minimum fee at that point may have reduced the contractor's incentive to complete the job within reasonable costs. Our consultant indicated that after contractors lose profit incentive, they are primarily motivated by pride to complete the job efficiently.

However, PG&E informed us that even though the minimum fee was paid early in the job, the contractor continued to be motivated to control costs because the contractor had other monetary incentives. For example, the fee could be renegotiated if one of the three conditions discussed earlier occurred. To demonstrate that an additional fee is appropriate, the contractor would need to perform well and demonstrate the necessity of the additional fee during the final negotiations with PG&E. However, our consultant

indicated that the contractor may not be sufficiently motivated to control the direct costs of work resulting from change orders because the costs incurred are paid in accordance with the cost-reimbursement provision of the contract. The contractor's only risk in performing additional work is the possibility that the costs will not be included in the final target cost, which is used to renegotiate the contractor's fee.

Our consultant identified another provision in the contract that may limit the contractor's incentive to control costs. Specifically, even a small amount of cost overrun in the target cost can reduce the amount of the base fee to the amount of the minimum fee. Because the contractor and PG&E share target cost overruns equally, a target cost overrun of only $5,000,000 reduces the contractor's fee to its minimum of $15.5 million ($18,000,000 - 2,500,000 = $15,500,000). Therefore, when target cost overruns become known, the contractor's incentive could again be reduced because he can earn an additional fee only if renegotiation occurs. Because monthly payments to the contractor often exceeded $1 million during the construction of the Helms Project, the base fee could be reduced to the minimum fee within a few months. The consultant stated that reducing the minimum fee or increasing the base fee would help to maintain maximum incentive over a longer period of time.

In addition, our consultant stated that cost-reimbursable contracts require considerable involvement by the owner to control the contractor's performance and the cost of the project. Specifically, the owner must monitor and review the actual costs claimed by the contractor to ensure that they are accurate and proper. The owner must review invoices for material, labor, equipment, and other items to ensure that cost claims are properly supported. Such contracts also require the owner to measure and verify every month the quantities of materials used on the job. This type of monthly monitoring is also necessary to document the need for renegotiating the fee.

Finally, cost-reimbursable contracts also require the systematic auditing of project costs during the whole project. The owner must begin project audits early and update them every three-to-six months. These audits require a uniform system of accounting so that the contractor's and the owner's records will correspond. Furthermore, our consultant stated that this type of contract could permit the owner to become actively involved in such cost control activities as purchasing, scheduling, and storage, and that the owner may also help determine construction methods and techniques and the execution of the work.

PROJECT MANAGEMENT SYSTEMS

Strong project management systems are needed to administer cost-reimbursable contracts effectively. These systems help to ensure that projects are completed on time and at a reasonable expense. PG&E has established management systems to monitor and control costs and to supervise the construction of new projects.

We reviewed seven major control systems and found that PG&E has adhered to most of the requirements of these systems. However, we did note weaknesses that could affect the cost of the Helms Project. The quality control system is effective in monitoring the contractor's work, the cost control system is effective in reporting on project costs, and the target cost system has been properly administered. However, the project lacked an adequate system for controlling schedules during the first two years of construction. Weekly schedule reports were not produced until 1979, and most of the reports we reviewed lacked important elements. Schedule delays were crucial in increasing project costs, and early delays affected many aspects of the work.

In addition, the project's accounting and auditing controls contain weaknesses. Although these systems were generally in place throughout the project, there were limited

technical reviews of invoices and gaps in the documentation of costs paid by PG&E. Also, auditing was sporadic and limited in scope during the first years of construction. Although PG&E made improvements in the later years of the project, weaknesses remain in the review of invoices and in the use of information contained in audit reports. Further, we found that the project had some security problems and that PG&E adequately reviewed and resolved the problems that we examined. On the following pages we discuss each of the seven major control systems.

Quality Control System

PG&E designed the quality control system for the Helms Project to monitor and report on the performance of the civil contractor in building the project in accordance with contract and design specifications. The system relies on engineering and inspection staff meetings, memoranda and written instructions, construction drawings, and reports by inspectors. Our review of reports and documents indicates that the quality control system has been effective in monitoring the contractor's work. Although inspectors did not consistently report some elements of daily performance in daily reports and logs, this information was recorded in other reports.

Our analysis of the quality control reporting system showed that inspectors observed and reported on the contractor's performance from the start of construction. We reviewed 211 sets of daily reports and logs for the period from September 1977 through June 1981 and found that inspectors routinely observed the contractor's work and measured it against the applicable specifications and standards. Inspectors recorded the nature of the work performed and reported on problems related to the contractor's work.

Inspectors did not, however, consistently report on certain aspects of the work in their daily reports and logs. For example, the procedures of the quality control system require the inspectors to record in daily progress reports and logs the quantities of all materials placed on the job so that PG&E can compile accurate records of the materials used in the project. Some of the reports we reviewed were prepared for work that did not require the use of construction materials. For example, some of the reports were prepared early in the construction period for excavation work that may not have required the placement of materials. In 92 of the 211 reports, inspectors reported that some materials were used; however, inspectors only recorded specific quantities in 29 (32 percent) of those 92 reports. Project engineers told us that inspectors record the quantities of materials in other reports, such as

reports on the placement of concrete and reinforcing steel. We reviewed these placement reports and verified that the inspectors had reported quantities of materials.

The quality control system also requires inspectors to provide a detailed summary of the day's accomplishments so that reliable information on the control of costs and schedules can be produced. Only 63 of the 211 reports we reviewed (30 percent) contained this information. Engineers told us that if daily progress reports and logs do not provide this information, it can be obtained from materials placement reports compiled by field engineers.

Cost Control System

The Helms Project cost control system reports on and manages project costs. To identify adverse trends, project engineers calculate actual costs for each major account of the project and compare both the actual and the estimated costs with the current authorized levels. Project engineers calculate the actual costs and the estimated costs each month and report them to the staff of the project, to PG&E's management, and to the Federal Energy Regulatory Commission. We reviewed the cost control system and two major reports, the weekly progress report and the monthly engineers' cost

estimate, and found that these reports were produced from the start of construction and that their major requirements were met.

Project engineers use information about each major element of the project contained in the weekly progress report to estimate the amount of work remaining and the final costs of the project. The weekly progress reports provide information on the progress of construction, the labor used by the contractor, the percentage of the project that has been completed, and the quantities of material used. We reviewed 20 weekly progress reports submitted between June 1977 and January 1982 and found that weekly progress information was consistently reported. All reports contained figures for labor used on the job and the percentage of the project that had been completed. Most of the reports contained data on the quantity of materials used.

Project engineers also prepare monthly reports on estimates of costs. These reports contain information on the actual costs for each major project account. The engineers obtain this information from the contractor's monthly billings and estimates of the project's final costs. Engineers report the actual and the estimated final costs as well as the current authorized amounts for each major project account. The monthly reports provide the project's management and PG&E's corporate

management with the information they need to identify and correct adverse trends in the costs of the project. We examined 21 monthly engineers' reports on estimated costs for the period from April 1977 through January 1982. Our review indicated that these reports have been prepared since the start of construction and that they all contain information about the costs of the project to date, the estimated final costs, and the authorized amounts for major accounts in the project.

Schedule Control System

The schedule control system for the project compares actual progress to planned progress and then changes schedules to correct deficiencies. Before January 1982, the Helms Project's schedule control system did not adequately report information about scheduling to the management of the project. Currently, however, the reports comply with the requirements of the system.

The civil construction contract provides the contractor with schedule requirements for completing various stages of work. Currently, a system of reports and memoranda provides PG&E management with the necessary information about the project's schedule to ensure that the contractor has the necessary personnel and equipment to meet the schedule and to anticipate delays.

Before March 1979, the project did not have a formal method for reporting information about schedules. Project management relied on meetings with the project staff and the contractor's representatives for such information. Weekly schedule reports were not prepared until March 1979, and most of the reports we reviewed lacked some of the required information. Moreover, memoranda indicate that the PG&E project superintendent was critical of the contractor's scheduling techniques.

We requested 21 weekly schedule reports for the period from April 1977 through January 1982. However, because weekly schedule reports were not prepared before March 1979, we were able to review only 12 reports produced from March 1979 through January 1982. Most of these reports lacked lists of scheduled objectives, critical activities, and actions taken to maintain or accelerate the schedule. PG&E informed us that these actions were taken, but we could not verify this from the available documentation.

PG&E's resident civil engineer and project superintendent believe that meetings with the contractor were sufficient to monitor and control the schedule of the project. They felt that schedule reporting was unnecessary early in the project because the work was not complicated. However,

memoranda from these meetings indicate that while schedules were discussed, PG&E did not set goals, establish requirements, or require corrective action. Moreover, project records indicate that several different excavation and construction operations were occurring at the same time during the early stages of the project and that progress was delayed at least six months during the first one and one-half years of construction. Furthermore, the project superintendent and the resident civil engineer were critical of the contractor's scheduling techniques and ability to plan. Several memoranda indicate that the contractor was consistently missing scheduled completion dates. We did not attempt to determine how much of the delay was due to the lack of a schedule control system.

The lack of a formal system for controlling the schedule early in the project and the inconsistency of later reports provided inadequate schedule information to PG&E management. PG&E maintains that this information was being supplied to management through meetings and other reports. However, in our review of other reports and documents, we could not verify the existence of all of the elements of a schedule control system early in the project. Consequently, PG&E may have missed opportunities to compensate for delays in the schedule. The contractor's inability to meet the schedule may have compounded the problems caused by inadequate information.

PG&E's resident civil engineer feels that scheduling is now more sophisticated because the work is more complicated and requires additional planning. PG&E uses a computerized schedule monitoring system, PREMIS, to assist in scheduling the work of the electrical/mechanical and civil contractors.

Target Cost Adjustment System

The system for adjusting the target cost is designed to compile and document on a monthly basis all the data necessary to compute the target cost of the project. This system must account for all quantities of materials and work performed in each part of the project, including the costs of any additional work approved through contract and field change orders. The system must also compile accurate and well-documented information because the final target cost is used to negotiate the amount of fee to which the contractor is entitled. In addition, because the renegotiation of the contractor's fee is based in part on the amount of additional work performed, the system must accurately account for this work.

We found that the target cost was adjusted each month to reflect changes in the quantities of bid items and to reflect the costs of work change orders. We reviewed four bid items to verify that they were adequately documented. The

project records included the inspection reports, quantity logs, back-up sheets to support the changes in the target cost, and the target cost book used to summarize all changes. Although our review was limited, it showed that the documents were prepared according to established procedures.

We also obtained records related to the resolution of disputed items. Sixty-eight of these disputed items relate to portions of the work that the contractor feels are beyond the scope of the initial job requirements and that require additional money and time to complete. Causes for disputed items include unforeseen geological conditions, changes in design requirements, and accelerated construction schedules.

We reviewed the files of 14 disputed items and found that they complied with requirements contained in procedural manuals for the project. The files contained correspondence between the contractor and PG&E, technical analysis of construction work, estimates of cost, and inspection and engineering reports. The documents appeared complete and well-organized, and they may be sufficient to resolve disputes over requests for adjustments of the target cost.

Progress Payment
and Accounting System

The progress payment and accounting system involves issuing monthly payments to the contractor and includes all reviews performed to ensure that costs incurred by the contractor and paid by PG&E are appropriate and adequately documented. The key elements of this system include a technical review of vendor invoices by PG&E's lead inspector and an accounting review by PG&E field clerks of vendor invoices and the contractor's monthly billing. Another important element of the system is the accounting process whereby the actual costs of the project are entered into the company's accounting records.

Most of the controls within the progress payment and accounting system were in place throughout the project. However, compliance with requirements varied. PG&E's accounting process was in order, and internal accounting documents were generally well-prepared according to available information.* However, the technical review of invoices was limited, and significant gaps in the documentation supporting vendor invoices existed during the first two and one-half years of the project. The lack of invoice reviews and supporting

* "Internal accounting documents," as we use the term, include the Certificates of Payment, the Accounting Data Sheets, and the job cost reports prepared by PG&E.

documentation increases the potential for the contractor's being paid for costs that are not related to the project. Although PG&E has improved in these areas, the potential for improper payments still exists.

One control within the system, the technical review of invoices, ensures that vendor invoices submitted by the contractor are reasonable. While the procedural manual for the project does not define "reasonable," the project superintendent defines "reasonable" as referring to costs that are related to the project. A project engineer or technical staff member who is fully knowledgeable about the progress and the construction activities of the project must conduct the technical reviews.

There is little evidence in our sample that these technical invoice reviews were conducted before July 1980. Invoice transmittals were not always initialed and memoranda detailing questionable items were not prepared. In addition, although the invoice review memoranda were prepared beginning in September of 1980, there is a six-month gap in the file between July 1981 and December 1981. The project superintendent indicated that technical invoice reviews had been conducted since the beginning of the project and that the six-month gap in the file meant that the lead inspector found nothing unreasonable or questionable. We were not able to

verify these statements by reviewing invoice documents or other related project documents because they are prepared on an exception basis only. The lack of documentation of reviews before July 1980 and the six-month gap in the file limited the effectiveness of the technical invoice review as a control element. Without the technical review of the invoices, PG&E must rely on a sample taken during its audit after the invoices have actually been paid.

The accounting review of invoices, another control element, verifies the mathematical accuracy of vendor invoices and ensures that they are properly prepared and supported by purchase orders and packing slips. This control is designed to guarantee that PG&E pays only for properly incurred costs. PG&E field clerks conduct these reviews.

PG&E field clerks verified the mathematical accuracy of invoice amounts in four of the six months we reviewed; for two months, we found no indication that the field clerks had verified the accuracy of any invoices. These invoices totaled $4,407,067. PG&E was subsequently able to provide documentation that some invoices were checked in one of these months. Although we found only minimal errors in the invoices we reviewed from those two months, PG&E has no assurance that the payments made to the contractor for all these invoices were

correct. Verification of the mathematical accuracy of invoices is also performed as part of PG&E's auditing of the contractor's records.

In addition, our review of 150 invoices from throughout the project (1977-1981) shows that a high percentage of purchase orders were missing or improperly prepared and that many packing slips necessary to document the delivery of goods were also missing. Of the 134 invoices in our sample requiring purchase orders, 18 (13 percent) were referenced to purchase orders that were missing, while 23 (17 percent) were not referenced to any purchasing document. Ten invoices in our sample (8 percent) were referenced to purchase orders that lacked a proper signature of approval.

Without properly approved purchase orders to support invoices, PG&E cannot be fully assured that the contractor made the purchases in accordance with purchasing policy or that the purchases in fact constitute proper job costs. We did note some improvement in these areas in the last two years of the project. From 1977 through 1979, the first two years, 29 percent of the invoices in our sample were lacking purchase orders and 23 percent were not referenced to any purchasing documents. These rates decreased to 0 percent and 13 percent, respectively, during the period from 1980 through 1981. However, the incidence of unsigned purchase orders in our

sample increased over time. For our sample, the rate of occurrence of this problem increased from 0 percent during the period from 1977 through 1979 to 14 percent from 1980 through 1981.

Of the 134 invoices in our sample for which purchase orders were required, 19 (14 percent) were referenced to purchase orders that did not show unit prices. The absence of unit prices makes it more difficult to determine whether purchases are made at authorized prices. Granite-Ball-Groves' purchasing policy states that all purchase orders must have unit prices and extensions. This area, too, showed improvement. From 1977 through 1979, this problem occurred 18 percent of the time in our sample; the rate of occurrence decreased to 11 percent during the 1980 through 1981 period.

Finally, we could not find packing slips or other documentation showing receipt of goods for 30 of 129 (or 23 percent) of the invoices that required packing slips. The rate of occurrence of this problem in our sample increased from 21 percent between 1977 and 1979 to 25 percent from 1980 through 1981. Without receiving documentation, PG&E cannot be assured that the costs charged to the Helms Project are for materials and supplies actually used on the project. Although we were not able to find all required packing slips, we did

note on most packing slips we reviewed the signature of the PG&E field clerk who witnessed deliveries at the contractor's warehouse.

Project Auditing System

To administer any cost-reimbursable contract, the contractor's reported costs must be audited from the start of the project to assure their validity and reasonableness. This auditing should be done periodically (e.g., every three or six months) and should include reviews of internal control as well as tests of monetary transactions.

PG&E has used three groups to perform audits during the project: the Internal Auditing Department, Helms Project field clerks, and the General Construction Special Audit Team. The Internal Auditing Department and Helms Project field clerks conducted the majority of their audit work during the first three years of the project. Their audits were sporadic and limited in scope, and they did not provide PG&E with a sufficient assessment of the contractor's management abilities. By establishing the General Construction Special Audit Team in 1980, PG&E greatly improved its monitoring of the costs of the Helms Project. In addition, the more intensive and regularly scheduled audit program that PG&E instituted provides project management with useful information that enables management to

pinpoint accounting controls that need strengthening. Major weaknesses still exist, however. The resolution of findings is not adequately documented, and the audit team does not follow-up on specific discrepancies identified in previous audits. When audit findings are not resolved, errors and problems may recur, thereby increasing the possibility of including improper expenditures in project costs.

The PG&E's Internal Auditing Department advised the General Construction Department on methods for performing project audits, and it audited project accounting controls in 1977. In 1980, the Internal Auditing Department began a comprehensive audit that was not completed because an accounting firm was hired to review the total costs of the project.* The Internal Auditing Department made informal recommendations to project management on methods to improve project accounting. However, it released only one report on PG&E's internal controls for the Helms Project. The Internal Auditing Department's audits were of limited value because although the department conducted follow-up work, it did not ensure that all the new controls were developed and implemented. Moreover, there was a three-year period between

* The accounting firm had not completed its audit by the time we finished our field work.

the Internal Auditing Department's first and second audits, and the department did not issue an audit report after completing the second audit.

Field clerks at the Helms Project also performed audits at the contractor's offices between February 1978 and May 1980 but only when the work fit in with their other accounting duties for the project. Their work included 5 accounting reviews and 11 observations of paycheck distribution. The field clerks conducted the accounting reviews every four to six months and observed the distribution of paychecks randomly from one to twenty-six weeks apart.

The field clerks' audits provided some control over project costs. The audit reports pointed out some problems, and the paycheck distribution observations provided some assurance that employees receiving checks were bona fide employees of the Helms Project. However, the audits contained three major weaknesses. First, reports from accounting reviews did not indicate the methodology used or the extent of tests performed, making it impossible to determine the scope of the audit work. Also, Granite-Ball-Groves was allowed to select the crews that PG&E observed during the distribution of paychecks, a situation that calls into question the degree to which the employees observed were representative of all employees on the project. Finally, the independence of the

field clerks as auditors and the thoroughness of their audits may be called into question. Having to fit the audit work in with their other accounting duties could affect the completeness and the usefulness of the field clerks' review.

In mid-1980, as the size and the cost of the Helms Project continued to grow, PG&E project management recognized the need for a more extensive means of auditing the contractor's cost reporting systems. Consequently, it organized the General Construction Department's Special Audit Team. The three auditors on this team are PG&E field clerks who are not associated with the daily accounting function of the Helms Project. The team audits the purchasing and payroll functions quarterly and reviews other areas, such as subcontractor payments, insurance claims, and adjustments of project costs. The Special Audit Team also reviewed a significant amount of expenditures on the project. The Special Audit Team issued nine reports from November 1980 through April 1982. These reports reviewed project records from April 1977 through December 1981.

From their random samples of invoices, the auditors of the Special Audit Team should be able to detect recurring problems as well as identify specific purchases for which the contractor either did not follow purchasing policy or made charges that were inaccurate or inappropriate. Although the

auditors do report on specific transactions that are incorrect, they do not identify a total amount by which they believe the project has been improperly charged.

The Special Audit Team also randomly tests payrolls and reconciles payroll taxes charged to the project with deposits made by Granite-Ball-Groves to the state and federal governments. Generally, these reviews have noted no major errors. Payroll expenditures account for approximately 50 percent of the costs of the civil construction work.

By implementing an in-depth review of all project costs that is independent from the daily accounting function, PG&E has developed a potentially strong management tool. However, PG&E has not always used this review to its full advantage, especially with regard to addressing audit findings. The audit team reports indicate that the contractor's compliance with the purchasing policies improved, but there are no indications that the auditors conducted follow-up reviews to determine what resolution, if any, was made for specific discrepancies noted in earlier reports. In addition, we found that it is difficult to document the project management's resolution of inaccuracies in individual items.

We discussed these matters with both the auditors and the project management. The auditors indicated that the responsibility for finding resolutions rested with project management. The project superintendent claimed that discrepancies were resolved through informal discussions with the contractor and that formal correspondence was rarely needed to effect changes. Typically, PG&E did not keep records of these meetings. Consequently, we were unable to substantiate these statements. PG&E has recently implemented a procedure to discuss the audit reports with the contractor.

Security and Inventory Control Systems

The security and inventory control systems of the project monitor and control the security of materials and equipment at the site of the project. The systems include a process to investigate, report, and resolve allegations of theft, as well as a control system for warehouse inventory.

Review of Security Issues and Allegations of Theft

Because of security problems that had been identified at the project, we reviewed the steps that PG&E took to investigate and resolve these problems. PG&E's Security Department and its Law Department conducted investigations and found that some problems did occur but that many of the

allegations of theft were unfounded. When allegations were proven to be true, PG&E's project management took corrective action.

In mid-1981, newspaper articles alleged widespread abuses by Granite-Ball-Groves and PG&E personnel at the Helms Project. These alleged improprieties included mismanagement, kickbacks, theft of building materials and large equipment, alteration of records, safety violations, and drug trafficking. From these allegations, we selected for further review those concerning inadequate project security, theft of building materials for personal use, theft of dynamite, and theft of heavy equipment. We analyzed the adequacy of PG&E's review and resolution of these problems.

When negative publicity concerning inadequate project security arose in mid-1981, PG&E's Security Department analyzed the performance of Granite-Ball-Groves and its subcontractor, REM Security, and determined that neither was fully capable of providing security at the Helms Project. In addition, PG&E stated that the changing nature of the job required a revision in project security. Consequently, PG&E took over the responsibility for project security in July 1981 and contracted with Security Specialists, Inc., for an interim period until a

final contract could be entered into. This contractor was selected because PG&E was satisfied with its work for the San Joaquin Division of PG&E.

Several newspaper articles reported thefts of project materials for personal benefit. One article alleged that a Granite-Ball-Groves supervisor used Granite-Ball-Groves employees and material to improve his home, and another alleged that PG&E employees accepted loads of crushed granite to fill in unpaved driveways at personal residences. PG&E's investigations revealed that these allegations were true. Several of the contractor's employees who were found guilty of wrongdoing were fired, and the PG&E employees who improperly accepted material from Granite-Ball-Groves were reprimanded.

PG&E's investigation also found that dynamite stolen from the Helms Project was used in the bombing of Harvey's Casino at South Lake Tahoe. Granite-Ball-Groves had reported dynamite thefts to the Fresno County Sheriff's Department. Those arrested for the bombing admitted to the Federal Bureau of Investigation that the dynamite had, in fact, been stolen from the Helms Project.

Newspapers also carried many stories alleging widespread theft of large equipment from the Helms Project. Of the allegations we reviewed, none could be substantiated.

For example, the allegation that 95 of 100 oxygen-acetylene torches were missing proved to be untrue. PG&E investigators found that of the 82 welding machines purchased, only 7 could not be found. In another case, a piece of heavy equipment was alleged to have been driven off the job. Investigations disclosed that the equipment in question was one of two D-8 Caterpillars purchased for the job. Both pieces of equipment were accounted for, although it is believed that a paperwork mix-up occurred when one was sent to Fresno for repairs. Apparently, this mix-up was responsible for the newspaper story.

Review of Inventory Issues

For most of the project, Granite-Ball-Groves had a warehouse at the Helms Project that received regular deliveries of construction materials. The contractor has written procedures for maintaining control of the warehouse inventory. PG&E, which has copies of these procedures, monitors the inventory controls by stationing a field clerk at the contractor's warehouse. According to the Helms Project Information Manual, the PG&E field clerk is responsible for observing deliveries to the warehouse and signing the packing slips to indicate that the deliveries were properly made. We tested PG&E's compliance with this procedure by examining the documentation supporting the 150 vendor invoices that were part

of our review of the progress payment and accounting system. Our test showed that PG&E adhered to this procedure throughout the project and that the rate of compliance was 98 percent. In our sample, the only time PG&E did not comply with this requirement was in August 1981.

Section E.5 of the Helms Project civil construction contract requires the contractor to take an inventory of small tools each month and notify PG&E of missing items. To test compliance with this provision of the contract, we reviewed all Theft/Loss Reports on file at the Helms Project. These reports had been used since the beginning of the project, but before March 1979, they had been prepared at quarterly or longer intervals. From March 1979, the contractor generally prepared them monthly as required in the contract. We found that there was often a one- to three-week lag between the occurrence of an alleged theft and the preparation of a report. We also found that some reports, especially those reporting losses of personal tools, were prepared from eight to eleven months after the losses occurred. The total estimated value of tools lost or stolen as reported in Theft/Loss Reports was $414,872.

As a final test, we reviewed the contractor's written procedures for controlling these tools and attempted to trace the recovery of stolen tools. According to these procedures,

Granite-Ball-Groves should assign responsibility for small tools to individual foremen and supervisors, but we were unable to determine to what degree the contractor has complied with these procedures. In our review of PG&E's investigation in response to allegations of wrongdoing at the Helms Project, we found that the Fresno County Sheriff, in an undercover operation conducted in January and February of 1980, recovered various small tools valued at approximately $10,000 that had been stolen from the Helms Project. As a result of the sheriff's investigation, four men (two of whom had been involved with the project and were employees of the contractor) were arrested. All pleaded guilty to charges of theft and were sentenced.

THE APPLICATION FOR RATE ADJUSTMENT

PG&E's application for a rate increase may not adequately portray the construction costs of the Helms Project because the application and the accompanying testimony do not provide a complete and clear discussion of project costs. Although the application is intended to be an initial description of the project, the testimony does not discuss some major factors that may contribute to cost overruns, and the analysis of the cost overruns is at times inconsistent. To ensure that any increase in the rate base includes only the reasonable costs of the Helms Project, the CPUC should, during its independent analysis of the Helms Project, place particular emphasis on reviewing specific factors that contributed to cost overruns. This analysis should be based on independently developed data or data provided by PG&E that have been independently verified. We discuss some of these factors on the following pages.

PG&E submitted its request for a rate adjustment to the CPUC in April 1982. The application proposes a method for adjusting rates and provides financial data to support this method. The application estimates that the first unit of the project will become operational in October 1982. PG&E is requesting a rate increase of 0.288 cents per kilowatt hour, which would increase the utility's revenue by approximately

$159 million based on rate levels of January 1, 1982. The net addition to the rate base for the Helms Project amounts to approximately $684 million, which will add approximately 13 percent to PG&E's estimated 1982 rate base.

PG&E's application states that if the Helms Project rate base increase is not approved, PG&E's return on equity would be reduced from 16 percent to approximately 13 percent. The Helms Project manager's written testimony, which accompanies the application states that all costs incurred for the Helms Project were reasonable and prudent and that any reduction in the rate base allowance would be unjustified. The document discusses the current estimated capital costs, and it explains why the costs of the project exceeded the initial estimates.

According to the application, the current estimated final cost of the Helms Project is $738,478,000, while PG&E's initial cost estimate, made in 1973, was $211,000,000. However, PG&E viewed this figure as conceptual in nature and said that it was made before geotechnical investigations, discussions with agencies, environmental studies, or detailed designs were completed. PG&E also said that the initial estimate served as the basis for the required project applications it submitted to governmental agencies. In July 1977, PG&E revised the estimate to $381,350,000 to allow for

delays in receiving a Federal Energy Regulatory Commission license, for updating all estimated costs, and for additional costs that became known when PG&E awarded the contracts to the Helms Project contractors. In June 1981, the estimate was revised again to $652,717,000 to include the increased costs that occurred during the first four years of construction. The project costs contained in PG&E's application estimate is $738,478,000. The first of the three generating units will begin operating in October 1982. Table 1, on the following page, shows how the estimated costs of the project changed between 1973 and 1982.

TABLE 1

ESTIMATED COSTS OF THE
HELMS PUMPED STORAGE PROJECT
(unaudited/in thousands)[a]

	1973 Estimate	1977 Estimate	1981 Estimate	1982 Estimate
Direct Work	$109,560	$174,070	$317,197	$353,751
Indirect Work	16,550	82,530	126,642	151,268
Subtotal	126,110	256,600	443,839	505,019
General Engineering and Administration	10,090	33,360	46,954	73,600
Ad Valorem Taxes	3,780	7,435	8,636	9,436
AFUDC[b]	27,740	61,580	153,288	150,423
Subtotal	167,720	358,975	652,717	738,478
Escalation	43,280	22,375	--- [c]	--- [c]
Total	$211,000	$381,350	$652,717	$738,478

[a] Costs for transmission lines and communication equipment are not included in these estimates.

[b] Allowance for funds used during construction: the net cost of capital used for construction.

[c] The escalation amount is included in each of the above categories.

Source: PG&E Application 82-04-12, April 1982.

According to the testimony presented with PG&E's application, the increase in costs occurred for two main reasons: escalation (i.e., inflation) and increased overheads, and increased work resulting from unforeseen factors. PG&E

views "unforeseen factors" as those that are beyond PG&E's and the contractor's control and that result in the need for additional work and personnel. The following items, listed in general order of importance, are the major unforeseen factors that PG&E believes increased on the costs of the Helms Project:

1. Unexpected geological conditions, such as unstable rock and ground compositions;

2. Expanded work force required to expedite schedule;

3. Design changes to accommodate conditions in the field, such as adding two additional access tunnels to eliminate traffic congestion;

4. Severe winter conditions;

5. Construction problems, such as the malfunctioning of concrete pumping devices caused by the irregular nature of the crushed granite aggregate used to make the concrete mixture;

6. Revision of the work schedule causing some work to be performed in winter;

7. Methods employed by the contractor, such as the techniques for drilling the tunnels;

8. Remote location of the project making it difficult to hire a stable labor force and leading to supervision and labor problems;

9. Increased overtime costs stemming from additional construction time; and

10. Increased overhead costs.

In addition, PG&E believes that the interaction of these factors, what it calls "the ripple effect," compounded their effect on the cost of the project and delays in the schedule.

Evaluation of Causes for Overruns

To assess the adequacy of PG&E's request for a rate increase, we reviewed the factors that PG&E claims increased the cost of the project. The testimony provided by PG&E in its application omits important information about the causes of some of the overruns and provides unclear explanations for others. For example, PG&E claims that escalation (inflation) and increased overhead (including allowance for funds used during construction) were major causes for increased costs in the 1977 estimates of the project's cost. The testimony states that $210 million (or 59 percent) of the current estimated cost increase is attributable to escalation and increased overhead.

However, the document does not provide a clear explanation of the method and basic computations used to arrive at the amounts of escalation and overhead. Further, PG&E's testimony discusses neither the specific cost of the 21-month schedule delay nor the degree to which escalation increased as a result of this delay. While escalation definitely increases costs, some of these costs may have been avoided if the project schedules had not been delayed almost two years.

The testimony also does not fully discuss some factors that may have had a significant effect on the costs of the Helms Project, particularly the impact of the civil contractor's performance in managing and constructing the project. Although the testimony points to some problems with labor and supervision and discusses some of the effects of methods used by the contractor in constructing the project, the project manager states that the contractor performed admirably under adverse conditions. However, memoranda from PG&E's project superintendent and resident civil engineer were highly critical of the contractor's performance.

In a report prepared in May 1980 evaluating the contractor's performance from the beginning of construction, the Helms Project resident civil engineer described the contractor's performance as less than satisfactory. The

resident civil engineer found the contractor's performance to be below average in planning, supervision, control of costs, safety, and quality of work. He judged the contractor's control of scheduling to be poor. In addition, the resident civil engineer stated that cost overruns were apparent in all areas and that poor supervision, planning, and productivity were the major causes of these overruns. Finally, the engineer found that poor control of the warehouses contributed to security problems and theft.

The Helms Project superintendent indicated in a memorandum that he completely agreed with the resident civil engineer's evaluation. He indicated that problems in construction occurred because of inadequate management and control by the contractor. He also indicated that the contractor lacked competent and experienced personnel, an effective communication system, and the capability for long-range planning.

The testimony also claims that unforeseen geological conditions were a major cause of cost increases. Geological problems arose in many of the major sections of the project. For example, the contractor encountered unexpected ground conditions when constructing each of the three tunnels, the powerhouse, the powerhouse access tunnel, one of the two

intake-discharge structures, the incline shaft, and one of the two surge chambers. These problems contributed to increased costs and schedule delays. PG&E claims in its testimony that preliminary investigations and plans indicated that few problems would be encountered. Moreover, PG&E denied the existence of several of the changed geological conditions mentioned above when the contractor requested an adjustment of the target costs to reflect added work. In some cases, PG&E did not allow an additional adjustment of the target cost because it believed the conditions were anticipated in the bid items and that unforeseen geological conditions did not exist. PG&E has recently allowed target costs adjustments based upon changed geological conditions because the contractor was able to submit documentation justifying the adjustments.

The testimony also does not detail the precise impact of any of the unforeseen factors on the cost overruns. PG&E informed us that it expects a detailed analysis of costs to occur during the rate base proceedings. The testimony states that the general nature of these factors makes it extremely difficult to assess the specific costs attributable to each of them. It claims that the complex interaction of these factors had a "greater impact...than would be expected from analyzing any one of them individually." However, several of the factors mentioned in the testimony are detailed in contract and field

change orders, and the costs of remedying some of the problems are available in project records. Without more detailed data on costs, the CPUC will not be able to test the validity of these unforeseen factors, and it will not be able to assess the relative impact of the causes on the cost overruns.

Finally, PG&E's decision to maintain the level of the lakes during the summer to use the water for hydroelectric power also affected cost overruns. The decision delayed scheduled work on some major portions of the project, forcing these portions into the winter construction schedule. PG&E testimony indicated that even though this shift increased project costs, a cost-benefit analysis showed a potential net savings of $6 million. This estimate was based on a shift in the schedule for one winter only. In fact, however, the decision to maintain water levels occurred for three summers and required the work to be done during three winters. PG&E prepared cost-benefit analyses to justify the decision; however, they were incomplete and were insufficient to show that the decision was economical. The analyses do not fully assess the potential impact of delayed construction on the increased costs of construction loan interest, the costs of PG&E supervision, or the costs resulting from inflation and work performed during the winter. While the total costs of these changes are difficult to quantify, PG&E officials

indicated to us that they are currently trying to determine the overall cost of the scheduling delays that resulted from the decision to maintain the level of the lakes.

CHAPTER III

CONCLUSION AND RECOMMENDATIONS

The California Public Utilities Commission needs to improve its systems for approving and monitoring utilities' construction projects and for ensuring that construction costs included in the rate base are reasonable. The systems used by the CPUC could prevent it from adequately reviewing project costs and from identifying unreasonable expenditures. The CPUC, therefore, may not adequately protect the utility consumer from paying for construction costs that should not be included in the rate base.

The procedures that the CPUC follows for approving projects do not ensure that it adequately reviews utilities' applications to construct new projects. For example, the CPUC insufficiently assessed the need for and the projected cost of the Helms Project, and it generally relied on information provided by PG&E when it examined the benefits and feasibility of the project. Although recent changes have improved its project approval process, the CPUC lacks written procedures to ensure that new projects are adequately reviewed before they are approved. There is also a lack of coordination between divisions that participate in the approval process. In

addition, the CPUC lacks assurance that construction contracts include appropriate provisions for control and that management systems are in place to control the cost of projects and the performance of contractors.

The CPUC has also performed limited monitoring during the construction of utilities' projects. The CPUC performed a limited review of the progress and costs of the Helms Project during construction, and it collected inadequate information to determine whether the costs of the project were reasonable. Although the CPUC is currently initiating a review of Helms Project costs, such after-the-fact reviews may be inadequate to effectively assess the efficiency of project management and the prudency of incurred costs. As a result, it will be difficult for the CPUC to assess the impact that weaknesses in construction management systems have on the final costs of projects, and to delete costs that are not legitimate.

Because of the deficiencies in project approval and monitoring, the CPUC may not be able to identify unreasonably incurred project construction costs and thus may not adequately protect the utility customer. The effect of these deficiencies becomes significant when there are weaknesses in utility management of construction projects that could contribute to cost overruns. In addition, the CPUC's effectiveness is further limited when utility rate increase applications do not

clearly discuss project cost increases. In the case of the Helms Project, we found that these conditions did exist. For example, the civil construction contract, although generally adequate to protect the interests of both parties, contains some provisions that limit the contractor's incentive to control costs. These provisions resulted in PG&E's paying the contractor the minimum fee almost three years before the project is to be completed. Also, while most of the project management systems were in place, we found weaknesses in PG&E's systems for controlling schedules, approving invoices, and conducting audits. Neither an adequate schedule control system nor a formal auditing system was in place during the first years of the project, and the controls for approving invoices were not in place nor did they thoroughly document the costs charged by the contractor. In addition, PG&E's application for a rate increase contains inadequate information to support sufficiently PG&E's request for an adjustment of the rate base. Although this application is preliminary information to support a rate base adjustment, the documentation does not address some important factors that may contribute to cost overruns, and the analysis is sometimes unclear.

RECOMMENDATIONS

To ensure that increases in utility rates are fair and reflect only those costs that are reasonably incurred during the construction of utilities' power-generation projects, the California Public Utilities Commission needs to improve its procedures for approving and monitoring such projects and its procedures for reviewing rate base offset proceedings. The CPUC has recognized many of these weaknesses and has planned or initiated some corrective actions. However, additional improvements are needed. Specifically, the CPUC should do the following:

- Develop written standards and procedures for reviewing and approving utilities' applications to build power-generation projects. These procedures should include standardized approaches to assess the need for, costs, and economic feasibility of projects, and to ensure that contracts include appropriate provisions for control;

- Develop new and uniform procedures to review the adequacy of project management systems before approving the construction of new utility projects. The procedures should ensure that that management systems adequately control costs, work schedules, accounting and auditing procedures, and the security

and quality of the project. Each of the control systems should also include a reporting element that provides useful, timely, and accurate data on the progress of the project and the performance of the contractor;

- Consider establishing incentives to encourage utilities to construct projects according to agreed upon costs and schedules. Such incentives may include a ceiling on the final costs of the project and a specific deadline for completing the project. The CPUC may want to require a review of any adjustments and modifications of such incentives;

- Develop a standardized approach to monitoring the construction of utilities' projects. Monitoring procedures should ensure that information on the progress of a project is collected throughout construction and that this information allows the CPUC to determine whether the final cost of a project is reasonable. The CPUC should collect and systematically review data on costs and schedules, and it should visit sites and assess the performance of contractors as necessary. The CPUC should consider integrating its data collection procedures with the reporting elements of the utilities' project management systems. Project monitoring requirements

should be established at the project approval stage and should be included in the certificate of approval granted to the utility; and

- Develop policies and procedures for determining whether the costs of project construction are reasonable. The CPUC should develop criteria to guide its staff in determining the reasonableness of costs and in identifying what information should be considered during the rate adjustment proceedings. These criteria should standardize the review of costs and include specific methods for reviewing various types of utility projects.

In addition, to ensure that only reasonably incurred project costs are added to PG&E's rate base, the CPUC should thoroughly review the costs of the Helms Pumped Storage Project. The CPUC should also plan for and develop methods for reviewing rate increases associated with utility projects currently under construction that were not subject to improved approval and monitoring. The review of the Helms Project should focus on determining the specific effect of the various factors that contributed to the overall increase in the project's cost. This review should include, but not be limited to, the following:

- A review of the effect of escalation (inflation) on direct, indirect, and overhead costs. This review should evaluate the impact of project delays on the amounts of escalation and determine the appropriateness of the inflation indexes and methodology used to determine the amounts of escalation;

- A review of the impact of geological conditions on delayed schedules and increased costs of construction. This review should assess the extent to which geological conditions were different from those anticipated in the specifications for the project; the adequacy of preliminary geological investigations in identifying ground conditions; and the appropriateness of planned and actual construction methods;

- A review of the performance of the civil construction contractor and the impact of such performance on the increased cost of the project. Job planning, scheduling, quality control, supervision, and accounting should receive special emphasis. Also, the CPUC should evaluate PG&E's assessment of the contractor's performance to identify areas where the contractor performed unsatisfactorily;

- A review of PG&E's involvement in determining the construction methods and the construction schedules. The review should assess the cost of maintaining the levels of Courtright Lake and Lake Wishon and the rescheduling that this action necessitated. The review should also assess the construction of the surge chamber, the construction of the incline shaft, and design changes for the intake discharge structures; and

- A review of final target costs and the process for renegotiating fees. Contract and field change orders and all adjustments to final target costs should be evaluated to ensure that adequate documentation exists to justify renegotiated fees. Particular emphasis should be given to disputed items.

Respectfully submitted,

Thomas W. Hayes

THOMAS W. HAYES
Auditor General

Date: August 24, 1982

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Public Utilities Commission

STATE OF CALIFORNIA

FILE NO.

August 19, 1982

Thomas W. Hayes, Auditor General
660 "J" Street, Suite 300
Sacramento, CA 95814

Dear Mr. Hayes:

You have asked for our comments on the attached report. The extremely short time allowed us does not permit a formal Commission response and the comments that follow are therefore those of the Commission's staff.

The report comments on Commission procedures for approving large power plants and for insuring that utility customers pay only the prudent and reasonable costs of power plant construction. These are important areas, in which the Commission has done much work in the past year. But, regrettably, the report offers generalities where hard evidence is needed and fails to address most of the tough issues involved in its recommendations.

Specifically:

-- The report advocates vigorous Commission monitoring of utility power plant construction, but the report is silent on the costs of doing this work and on its potential cost-effectiveness.

Monitoring is not cheap. Competent, well-trained staff is needed. Inspectors and auditors may have to be stationed at a construction site for a substantial time. Presumably, the more thorough the monitoring the greater the potential benefits. But the report offers no guidance of any sort as to the specific levels of monitoring that would be cost-effective, i.e., that would result in savings greater than the costs of the monitoring. Nor does the report recommend to the Legislature that it fund monitoring of any sort.

-- The report offers absolutely no evidence to support its claim that in the absence of monitoring, the Commission may have difficulty determining the reasonableness and prudence of Helms costs.

As required by law, the Commission will hold thorough, formal hearings on the Helms project of Pacific Gas and Electric Co. Not one cent of ratepayers' money has been used to build Helms; the costs of Helms have been borne by PG&E shareholders. PG&E will have the burden of proof in Commission hearings to show that any Helms construction costs it wishes to put into its rate base were reasonably and prudently incurred. To the extent the company fails to meet this burden of proof, the Commission may not legally allow the costs to go into PG&E rates. At these hearings, the Commission's staff will present its detailed analysis of Helms costs, and other parties may offer evidence. Because the hearings have not even been begun, there is no basis whatever for the report to conclude that the absence of monitoring is somehow fatal to a fair determination of prudency.

-- The report leaves the impression that Helms has been virtually the only issue before the Commission.

Reviewing the costs of major construction projects is an important way--but not the only way--in which the Commission must by law assure that utility customers are charged fair and reasonable rates. During the last few years, for example, the Commission has greatly expanded its work on utility fuel costs. The costs of the oil and gas that California utilities buy to generate electricity have risen sharply in the last few years. Fuel costs are now the single most important part of the cost of electric energy. For PG&E, fuel costs now total more than 60 percent of a customer's bill. Other aspects of a utility's operation, such as construction costs, are obviously of great importance too, but should be seen in perspective.

-- The report gives inadequate attention to the substantial work now under way to review the prudency of Helms costs.

For months, the Commission's staff has been assembling information about the construction of Helms. Outstanding consultants, experienced in building large

tunnel projects, are helping. Thousands of construction documents have been audited. Dozens of key participants in Helms have been interviewed. Site inspections have been made. It's possible that detailed, costly tracking of the project over the last several years would have provided valuable information that may not now be available, but the report offers no evidence that this is the case. Nor does the report offer any evidence to support its repetitious assertions that the absence of monitoring will impair the Commission's ability to reach a decision on the reasonableness and prudency of Helms costs. We emphasize that because hearings on Helms have not even been begun, and because the Commission has made no decisions yet on the reasonableness of Helms costs, the report has no basis for asserting that the Commission can't properly deal with these questions.

-- The report fails to make clear that the Commission has adapted its procedures to the changing needs of the 1980s.

For many years, in California, and in most other states as well, after-construction review of large utility projects was without controversy. Inflation rates were low. Projects were generally built on time, within budgets, using familiar technology. More recently, however, newer technologies, larger and more difficult construction projects, and inflation have led to longer construction periods and to cost overruns. Utility commissions in many states are struggling with this problem. Some have begun modest monitoring programs, but the information available to us indicates that they are not well staffed and the results of their work remain to be seen.

In any event, the Commission has instituted a more intensive review of construction estimates and costs. The Commission now requires that, even in ordinary transmission line projects, utilities establish clear cost estimates before construction begins, provide the Commission with quarterly reports on construction progress and costs, and otherwise keep the Commission informed as work proceeds. This may or may not yield better information for ultimately determining prudency, and the Commission will need

additional staff to make this program work on a significant scale. California utilities are not now planning large power plants comparable to Helms, but if such plants are proposed in the future, the Commission will propose to the Legislature a monitoring program for inclusion in the State budget.

The report dwells with excellent hindsight on the power plant approval procedures for the 1970s, but inadequately explains that the Commission's approval procedures in the 1980s are vastly different. This is evidenced by the thorough staff work on such recent projects as the proposed Harry Allen-Warner Valley coal plants in Nevada and Utah, and the Eastern Interconnection Project of San Diego Gas and Electric Co.

-- Most of the report presents conclusions without evidence. But in the long section that is a critique of the construction of Helms by PG&E, the report presents data but declines to offer any conclusions.

In general, the critique part of the report agrees with and supports staff work already done by the Commission. Much of this part of the report deals with PG&E's internal accounting controls on Helms project costs, but the report puzzlingly concludes that "we did not perform tests necessary for expressing an opinion" on these controls. We would nevertheless welcome the participation of the Auditor General in the hearings the Commission will hold. A substantial amount of taxpayers' money has been invested in the research the Auditor General has undertaken, and we believe it would be unfortunate if the results of this work were not presented in the hearings. We'll keep you informed as to the hearing dates and encourage your involvement.

Yours very truly,

Joseph E. Bodovitz

JOSEPH E. BODOVITZ
Executive Director

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August 19, 1982

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Sacramento, CA 95814

Dear Mr. Hayes:

We have reviewed at your request, in the very short time permitted, the portion of your draft report on California Public Utilities Commission (CPUC) oversight of utility construction projects that pertains to PGandE's Helms Pumped Storage Project. We have included as an attachment to this letter our detailed comments on your findings. We must specifically note that we were not asked to review the other sections of the report -- the summary, introduction, report on CPUC procedures, and recommendations. We also did not perform a detailed review of the report of your consultant, Harza Engineering Company. If the areas we have not reviewed contain any misstatements or incorrect interpretations of fact regarding Helms, we have not been able to correct them.

We are pleased with your general findings that PGandE's use of the cost-reimbursable contract was appropriate for the Project, and the contract itself was reasonable and adequate to control Project costs. We also are satisfied with the fairness of your conclusions that management systems were in place, and that their operation generally complied with Project requirements. We disagree with some of your findings regarding problems in Project management systems. Viewed in proper perspective, we think the problems you have identified are more properly characterized as matters of form and procedure rather than as matters of substance which could be said to have caused Project delays or cost increases.

We understand that an audit report such as this is an essentially negative document which focuses on problems rather than on the many strengths and accomplishments you undoubtedly came to recognize during your review. To put these findings into their proper context, it is important to appreciate the magnitude of the entire Project, and to understand the challenge it presented to PGandE's Project

management. As you are now aware, the Helms Project is an enormous and complex engineering achievement. Its scope is difficult for the casual reader of this report to grasp without a good deal of explanatory background. Such background was not included in this chapter of your report. Construction problems of great complexity developed from the remoteness of the site, the fierce winter weather, unforeseeable geological conditions and the application of state-of-the-art technology.

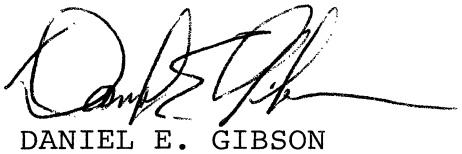
In addition to your general findings, you discuss many specific systems. You have described in your review of the Helms civil contract two items that you allege may possibly reduce contractor incentive to control costs. In our opinion, any reduction in contractor incentive resulting from these items is more than offset by the many other incentives to perform efficiently (some of which you identify in your report) that are built into this contract.

With regard to what you perceive to be the few weaknesses in PGandE's management control system, we believe it is fair to point out that in all cases there are compensating controls which ensure that management objectives are met. These concerns also often relate to limited documentation of compliance with controls, rather than to actual non-compliance with those controls. In our opinion, within the total control environment, these items cannot have had a significant impact on overall management control of the Project. We understand you have not made any attempt to quantify any such possible impacts.

Your criticisms of PGandE's application for rate relief do not adequately reflect the complete CPUC review process, to which we will be subjected. This includes exhaustive analysis of Project costs. We stand behind the content of our Application, but we know, and you should have explained in your report, that this is only the formal beginning of what will be an intensive and arduous process of CPUC data requests, analysis, investigation and adversary hearings. This process will thoroughly test the assertions we make.

We disagree with some of your report's findings, as detailed in the attachment. Nonetheless, we find this section of your report to have been prepared in a professional and competent manner.

Very truly yours,



DANIEL E. GIBSON

PACIFIC GAS AND ELECTRIC COMPANY
RESPONSE TO AUDITOR GENERAL

THE CIVIL CONSTRUCTION CONTRACT

PGandE believes that hiring Harza Engineering Company to analyze the Helms civil contract was an appropriate method of review. However, as was noted earlier, we did not review in detail the Harza report. The following comments, therefore, relate only to your interpretation of the Harza report. The following summarizes your findings and includes PGandE's response.

- The contract is reasonable and adequate to control project costs.
- The contract is consistent with other cost-reimbursable contracts.
- Provisions of the contract are well defined.
- The contract adequately provides for increased scope and duration resulting from unforeseen factors.
- Provisions of the contract help minimize any potential adversary relationship and litigation with the contractor.
- The contract provides a clear description of costs.
- The form of contract is rarely the cause of cost overruns.
- The monthly fee payment provision is not well defined and could result in early payment.
- The reduction of the contractor's fee for target cost overruns may be too small.

Your review indicates that you believe the fee was paid too early and the target cost fee reduction was too small, thereby reducing these two specific contractor incentives.

PGandE is in general agreement with the findings. With regard to the potential weakness of early payment of fee, however, PGandE feels that there were significant other incentives which operated throughout the construction period

and were adequate to control contractor's expenditures. These include:

- The desire to avoid losing other opportunities
- Avoiding the reduction of fee as a percentage of costs
- Limiting potential unreimbursed overheads
- Maximizing fee in renegotiation
- Fee increases from efficient control of actual costs in comparison to target costs
- Reputation of contractor

With regard to target cost overruns, PGandE disagrees that this is a potential weakness. The target cost provisions require that actual costs be compared to target cost at completion of the job. Regardless of the amount of fee reduction, the incentive remains until such time as the final comparison is made. It has been documented that the contractor believed throughout the construction period that their final actual cost would be less than final target costs.

It should be noted that Harza performed no review of the actual facts and circumstances at Helms, nor did they discuss the contract with PGandE or the civil contractor. They make recommendations at the end of the contract section which are controls and procedures that they believe should exist in a cost-reimbursable contract environment. As can be seen in later sections of your report, these types of procedures and controls were utilized by PGandE on the Helms Project.

In summary, we believe that of the two potential weaknesses identified, one is not in fact a weakness and any reduction in incentive due to early payment of fee was balanced by other incentives in the contract.

PROJECT MANAGEMENT SYSTEMS

Your report contains a review of seven major control systems and found that PGandE has adhered to most of the requirements of these systems. The following summarizes your findings and includes PGandE's response.

QUALITY CONTROL

This system is designed to monitor and report on the performance of the contractor and assure that construction is in accordance with the contract and related specifications. Your findings include:

- The quality control system has been effective in monitoring the contractor's work.
- The inspectors' reports do not consistently contain certain quantities and progress information.
- Typically, missing quantities and progress information can be obtained from placement and other reports prepared by engineers and inspectors.

PGandE is in general agreement with the findings in this area. It should be noted that not all inspector reports require the above information. Nevertheless, since the information is available from other reports, it is our opinion that this item has no significant impact on the effectiveness of the system.

COST CONTROL

This system manages and reports project costs to PGandE management and the Federal Energy Regulatory Commission (FERC). Your examination included a review of two major cost control reports (the Weekly Progress Report and the Monthly Engineers' Cost Estimate). The following summarizes your findings and includes PGandE's response:

- The cost control reports were consistently produced from the start of construction.
- The major requirements of the two reports were satisfied.
- The monthly reports provide PGandE project and corporate management with the information they need to identify and correct adverse trends in the costs of the project.

PGandE is in agreement with your findings in the cost control area.

SCHEDULE CONTROL SYSTEM

The schedule control system for the Project compares actual progress to planned progress and then reschedules work as necessary. The following summarizes your findings and includes PGandE's response.

- Currently there is a system of reports to provide PGandE management with schedule information.

- Weekly schedule reports were not prepared until March of 1979 and when they were prepared some lacked certain required information.

- Early in the Project PGandE management relied on staff and contractor meetings to obtain schedule control information.

The major concerns noted in your report relate to the documentation of scheduling information. We believe there has been, however, a sufficient scheduling system since the inception of the contract. The increase in complexity of the scheduling system has correlated with the increased complexity and changing nature of the construction. Similarly, the documentation of the schedule system has changed during construction. Specifically, weekly schedule reports were not required during the early construction. Also, much of the missing information which you noted, is in fact documented in other schedule reports and reports supplied monthly to the FERC.

TARGET COST ADJUSTMENT SYSTEM

This system compiles and documents data necessary to compute the target cost of the Project. The following summarizes your findings and includes PGandE's response.

- Documents for calculating monthly target costs were prepared adequately and on a timely basis.

- These documents were prepared according to established procedures.

- The files documenting disputed items complied with requirements contained in Project procedural manuals.

- The documentation of disputed items appeared complete and well-organized and may be sufficient to resolve disputes.

PGandE is in agreement with your findings in the target cost adjustment area.

PROGRESS PAYMENT AND ACCOUNTING SYSTEM

This includes procedures relating to review of costs and monthly payments to the contractor. The following is a summary of your findings and includes PGandE's response.

- Most of the controls within the progress payment and accounting system were in place throughout the project.

- Procedures relating to certificates of payment, accounting data sheets, and job cost reports were in order and prepared according to available information.

- The technical reviews of invoices by inspectors were limited.

- Some documentation of the tests for clerical accuracy of invoices by field clerks could not be located.

- Certain documentation (primarily from early in the Project) relating to the purchase orders and receiving documentation could not be located, and was not always in compliance with procedures.

PGandE agrees that most of the controls within the system were in place throughout the Project and that accounting documents were in order. With respect to the limited technical review of invoices by inspectors, this apparently only relates to the documentation of this review process. This review was performed on a test basis from the beginning of construction. Also, significant review of invoices was performed by various auditors having significant construction experience.

With respect to the clerical accuracy of invoices, there were other tests of this nature performed in addition to that of the Project field clerks. This included testing by the Special Audit Team of all large dollar invoices and other invoices on a test basis.

The items of documentation that could not be located only related to documents supporting a valid invoice. There were no cases where an invoice was not obtained. Further, the results of your review are not consistent with numerous other reviews of this nature by PGandE and an outside auditing firm. We believe that with sufficient time a significant portion of the unlocated documents could be found. Based on this and your relatively small sample size, we think your results should not be viewed as representative of the total population of transactions. In addition, it should be considered that the contractor has procedures and controls for review of clerical accuracy, reasonableness, and compliance with purchasing standards.

PROJECT AUDITING SYSTEM

This system includes review of costs charged to PGandE for validity and reasonableness. The following summarizes your findings and includes PGandE's response.

- The General Construction Special Audit Team, the Internal Audit Department and the Project field clerks performed audits during construction.

- The Special Audit Team provides management with useful information to pinpoint accounting controls that need strengthening.

- The in-depth review of project costs by the Special Audit Team is a potentially strong management tool.

- The Special Audit Team tested payrolls and reconciled deposits by the contractor to State and Federal governments. These reviews have noted no major errors.

- The field clerk audits were sporadic and limited in scope.

- The resolution of follow-up to audit findings is not adequately documented.

- The contractor was allowed to select the crews to be used in PGandE paycheck distribution tests.

PGandE agrees that there were three groups performing audits on the Project and the Special Audit Team is a potentially strong management tool. Since the Special Audit

Team's audits covered all periods of construction, this should eliminate concern or risk relating to the timing and scope of the field clerk audits. The concern regarding follow-up to audit findings is related only to the lack of a formalized system to document follow-up early in the Project. Follow-up did occur and is documented in correspondence between PGandE and the contractor. Further, there is a procedure for resolving all major disputes with the contractor prior to final payment. For administrative convenience, the selection of crews for paycheck disbursement testing was made by GBG management but not by those subject to the test. We believe this does not reduce the effectiveness of these tests.

SECURITY AND INVENTORY CONTROL SYSTEM

This system includes controls and procedures relating to monitoring and safeguarding of assets. The following summarizes your findings and includes PGandE's response.

- PGandE's investigations found that some security problems existed but that many of the allegations were untrue.

- When allegations were proven to be true, PGandE Project management took corrective action.

- In July, 1981, PGandE determined that current security was not adequate and took over responsibility for Project security.

- PGandE monitored the contractor's warehouse controls throughout the Project.

- PGandE observes and signs the packing slips for deliveries to the contractor warehouse. Compliance by PGandE was 98% in your tests of this procedure.

- The review was unable to test the degree of compliance with the contractor procedure to assign responsibility for tools.

- There were certain delays between the occurrence of an alleged theft and the preparation of a theft report.

PGandE generally agrees with the findings in the security and inventory control area with the following comments and exceptions. The determination that improved security was needed in July of 1981 was due primarily to the

increased complexity of the Project and the employ of other contractors on site rather than on a determination that the system was inadequate. As for tools, we believe the total dollar amount expended for tools was reasonable in relation to industry standards. The long delays in reporting tool losses were found typically to be on "personal" tools. Personal tools are often stored for long periods of time. Delays in reporting theft often result from not identifying the thefts until the tools are again needed, rather than from untimely reporting practices.

THE APPLICATION FOR RATE ADJUSTMENT

Your report contains a review of PGandE's application for inclusion of Helms Project costs in rate base. Your criticism of PGandE in this section is focused on what you perceive to be important factors in Project cost that were not discussed or completely analyzed in the Application. These include:

- The Application does not provide a clear explanation of the calculation of escalation.

- Memoranda criticizing contractor performance are not reconciled with the contents of the Application.

- Statements that unforeseen geological conditions were a major cause of cost increases are not reconciled with claims of thorough pre-construction geological testing and denial of target adjustment for some GBG claims of changed geological conditions.

- The Application does not detail the precise impact of unforeseen conditions on cost increases.

- Cost-benefit analyses of the decisions made to maintain high water levels in the Helms reservoirs were not adequately documented. This issue should have been included in the Application.

PGandE never intended the Application to serve as the sole basis of a rate relief decision. CPUC procedure anticipates, and PGandE expects, that all major aspects of Helms Project costs will be explored before rate relief is ultimately granted. Problems that we believe did not result in significant costs were therefore not included in the Application. Problems that PGandE believes were the causes

of significant costs were examined, but could not be exhaustively analyzed in the Application due to its timing. It should be remembered that such an application must be filed months before the project begins operation. This allows time for CPUC analysis of the costs, but also prevents complete analysis by PGandE in the Application, because Project costs are continuing. With access to PGandE documents and personnel, the CPUC will be able to perform its own analysis of the Project and reach its own conclusions as to the causes of increased costs.

With respect to your specific criticisms, we make the following comments. The calculation of escalation costs associated with the Project was sufficient for the purposes of the Application. Criticism of the contractor's performance was used to motivate the contractor. The memoranda referred to in your report had a very specific purpose, to activate a new GBG management team to move aggressively to meet Project schedules. You did not ask the authors of these memoranda to put them in context.

That geological problems were encountered is not inconsistent with having adequate pre-construction testing. Experts in underground construction recognize that even the most thorough testing may not detect significant problems. Such experts also realize that analysis of precise cost impacts of such bad geological conditions are difficult to analyze. PGandE expects this task to be accomplished as needed during the rate proceedings, but at the time of the Application, months before Project completion, it was not in a position to do so. The denial of some target adjustment requests that related to unforeseen geological conditions also is not inconsistent with PGandE's Application. Requests by the contractor for target adjustment due to bad rock were sometimes denied for failure to sufficiently document the problem and its costs.

Finally, cost-benefit analyses were performed at the time of the decisions to maintain high lake levels and postpone some construction tasks. At no time did this delay overall Project completion, and therefore, in our opinion, it did not result in significant cost increases. Without delays to overall Project completion, the costs associated with delays due to high water levels were minor. The benefits of the hydroelectricity to be generated were known to be sizable. The balance was so obviously in favor of holding water, that lengthy analysis was not needed.

AUDITOR GENERAL'S COMMENTS ON THE CALIFORNIA PUBLIC UTILITIES COMMISSION'S RESPONSE

Normally, we do not comment on agency responses in our audit reports. However, we found it necessary to comment on the California Public Utilities Commission's (CPUC) response in order to provide clarity and perspective in view of the CPUC's exceptions to the conclusion of our report.

The CPUC disagrees with our conclusion that without monitoring it will have difficulty determining the reasonableness of the costs of the Helms Project. This is inconsistent with its own management actions.

For example, in a Budget Change Proposal for fiscal year 1982-83, the CPUC staff stated that the CPUC is unable to evaluate utility construction expenditures effectively because the CPUC lacks a program to monitor utility construction projects. The proposal says that utilities may be authorized to earn a return on all construction expenses even though a certain portion of these expenses may be imprudent and excessive. In fact, the proposal further states that monitoring would permit the CPUC to conduct a more thorough review of utility construction projects thereby excluding imprudent expenditures for rate-making purposes. The proposal suggests that if the request for monitoring positions is denied, the credibility of the CPUC's decisions would be diminished, and the CPUC's ability to conduct a thorough study of project construction would be inhibited. The result, according to the CPUC, is that unreasonable and imprudent costs may be included in the rate base.

Also, the CPUC's Helms Project Cost Assessment Task Force concluded in its preliminary investigation that the CPUC should intensify its involvement in monitoring utility construction projects. The staff recommended monitoring projects during construction because it is difficult to evaluate and judge utility management decisions after-the-fact. The staff further recommended several project approval and monitoring actions to ensure that utilities manage projects efficiently and that the CPUC collects sufficient information to evaluate the projects. We draw similar conclusions and make similar recommendations in our report.

The executive director's response also criticizes our report for failing to discuss the other rate issues being reviewed by the CPUC and for failing to discuss clearly recent improvements in the procedures for approving new projects. The subject of our report is the CPUC's regulatory control of utilities' construction projects. The intent of our report was not to discuss the other issues currently before the CPUC. Instead, we were requested by the Legislature to review the management systems and procedures used by the CPUC to regulate utility construction projects with special emphasis on PG&E's Helms Pumped Storage Project. This scope of our audit is clearly defined and explained in the report. In addition, although the CPUC believes that we have not discussed the new procedures used to assess projects, we have in fact provided considerable evidence in Chapter I of the report that the CPUC has changed and improved its process for reviewing and approving utilities' construction projects. We explain, in virtually the same language contained in the CPUC's response, the reasons why projects did not receive a detailed review prior to 1980. We also indicate that the process has changed and that the CPUC has made more extensive reviews of the proposed projects. The CPUC apparently did not review these sections of the report.

Finally, the CPUC's executive director states that our report presents conclusions without evidence, and that we fail to present conclusions or render an opinion on PG&E's Helms Project. Our conclusions are thoroughly documented by sufficient evidence collected in accordance with generally accepted governmental auditing standards. The executive director fails to understand the scope and subject of our report. We specifically audited the CPUC, not PG&E; our conclusions, therefore, reflect this work and our recommendations are directed to the CPUC. Our purpose was not to render an opinion on PG&E's financial statements, but to recommend improvements in the CPUC's systems for regulating utilities' construction projects.

cc: Members of the Legislature
Office of the Governor
Office of the Lieutenant Governor
State Controller
Legislative Analyst
Director of Finance
Assembly Office of Research
Senate Office of Research
Assembly Majority/Minority Consultants
Senate Majority/Minority Consultants
Capitol Press Corps