

ORIGINAL

Decision No. 92553 DEC 30 1980

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

In the Matter of the Application)
of PACIFIC GAS AND ELECTRIC)
COMPANY for authority, among)
other things, to change certain)
rate schedules to implement)
additional time-varying rates)
for electric service pursuant)
to Decision No. 85559 as modified)
by Decision No. 86543.)
(Electric))

Application No. 58089
(Filed May 23, 1978;
amended December 14, 1979 and
April 28, 1980)

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Mobilehome Association; Johnson, Greve,
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Association; Dick Ratliff, Attorney at Law,
for California Energy Commission; and
John Blethen, Attorney at Law, for Toward
Utility Rate Normalization; interested
parties.

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Commission staff.

O P I N I O N

Summary of Decision

This decision directs Pacific Gas and Electric Company (PG&E) to file a new tariff Schedule No. A-21 to provide time-of-use rates for approximately 1,304 customers with demands between 500 kW and 1,000 kW. These customers represent a broad range of industrial and commercial processes including food products, oil and gas extraction, agriculture, lumber and wood products, merchandise stores, electronic equipment, and educational services. PG&E's time-of-use rates have formerly been applied under Schedules Nos. A-23 and A-22 to larger industrial and commercial customers with demands in excess of 4,000 kW and to large general service customers with demands between 1,000 kW and 4,000 kW, respectively.

We have said before "Time-of-day pricing would likely produce rates that more closely follow cost and it could result in conservation of energy." (Decision No. 85559, page 81, mimeo.) Time-of-use rates are expected to achieve a conservation effect in the sense that reduced peak demand will postpone the need for new generating facilities, which directly equates to savings for all PG&E ratepayers because new construction of generating capacity is reduced and less fossil fuel is required for peak demand period generation. The time-of-use rates adopted are similar to those proposed by the staff but have been adjusted by the Commission to reflect a reduced shift assumption from a 10 percent/6 percent to a 5 percent/3 percent on-peak/partial-peak demand and energy shift. These amounts of on-peak and partial-peak energy usage will be shifted to the off-peak period.

The basic revenue requirement for this customer class pursuant to Decision No. 91107 in Application No. 58089 dated December 19, 1979 is estimated to be \$73.1 million. No increase in revenue requirement is provided in this decision. Some customers should receive increased bills; some should receive decreased bills. A typical customer with a distribution of usage

similar to the class as a whole after a 5 percent/3 percent shift assumption should receive no increase.

PG&E is required to furnish customers a visual type demand meter or display equipment within 180 days after request by the customers.

The time-of-use rates are as follows:

Rates

	<u>Per Meter Per Month</u>	
	<u>Period A</u>	<u>Period B</u>
Customer Charge:	\$65.00	\$65.00
Demand Charge:		
Per kilowatt of Billing Demand	1.00	1.00
Energy Charge:		
On-Peak, per kilowatt-hour .....	.050	.030
Plus Partial-Peak, per kilowatt-hour .....	.020	.014
Plus Off-Peak, per kilowatt-hour .....	.010	.010

The time periods are as follows:

Period A shall be applicable to meter readings from May 1 to September 30, inclusive, for the following hours:

On-Peak	12:30 p.m. to 6:30 p.m.	(Monday through Friday, except holidays.)
Partial-Peak	8:30 a.m. to 12:30 p.m. 6:30 p.m. to 10:30 p.m. 8:30 a.m. to 10:30 p.m.	(Monday through Friday, except holidays.) (Saturday, except holidays.)
Off-Peak	10:30 p.m. to 8:30 a.m. All day Sunday and holidays.	(Monday through Saturday, except holidays.)

Period B shall be applicable to meter readings from October 1 to April 30, inclusive, for the following hours:

On-Peak	4:30 p.m. to 8:30 p.m.	(Monday through Friday, except holidays.)
Partial-Peak	8:30 a.m. to 4:30 p.m. 8:30 p.m. to 10:30 p.m. 8:30 a.m. to 10:30 p.m.	(Monday through Friday, except holidays.) (Saturday, except holidays.)
Off-Peak	10:30 p.m. to 8:30 a.m. All day Sunday and holidays.	(Monday through Saturday, except holidays.)

Application

By its application PG&E requests authority to apply time-varying rates to its medium light and power customers with demands from 500 kW to 1,000 kW. PG&E is seeking this rate change in order to comply with Decision No. 85559 in Case No. 9804.

The newly proposed time-of-use Rate Schedule No. A-21 attached to the amended application filed April 28, 1980 is designed to produce \$73.1 million, which is the same revenue level found reasonable for the proposed A-21 customers by this Commission in Decision No. 91107. Thus, the rate change proposed in this amendment would not affect the level of revenues PG&E's existing rates are designed to produce if there is a 10 percent peak demand and energy reduction and a 6 percent partial-peak demand and energy reduction. If the reductions are less, the level of revenues will be greater than the level in Decision No. 91107. If more, revenues will be less.

The proposed rates apply only to those customers with demands from 500 kW to 1,000 kW who have had or will have recording meters for measurement of kilowatt-hour (kWh) consumption by time-of-use installed pursuant to Decision No. 85559 and Decision No. 86543. PG&E identified 1,304 such customers.

Hearing

A duly noticed prehearing conference (PHC) and five days of public hearing were held before Administrative Law Judge J. J. Doran in San Francisco. The PHC was held on May 7, 1980 and the hearing on June 9, 10, 11, 13, and 19, 1980. Oral argument was held on June 19, and the matter was submitted on proposed findings and conclusions filed June 30, 1980.

PG&E presented two witnesses and three exhibits. The Commission staff presented two witnesses and three exhibits. The California Retailers Association (CRA) and Toward Utility Rate Normalization (TURN) cross-examined the witnesses.

History

In October 1974 we initiated an investigation into electric utility rate structures in order to identify and implement those structures which would discourage wasteful consumption of electricity. In the course of the investigation, the Commission considered more than a dozen alternative methods for designing electric rates which would achieve the maximum conservation potential. Decision No. 85559 dated March 16, 1976 found that time-of-day pricing could delay the need to install additional generating capacity, could result in conservation of energy, would produce rates which track costs, and should be implemented for customers with maximum demand in excess of 500 kW. The three major respondent utilities, PG&E, Southern California Edison Company (SCE), and San Diego Gas & Electric Company (SDG&E) were ordered to begin immediate implementation of time-of-use rates for the largest use customers where substantially all of the necessary metering was already in place, to start installing time-of-use metering for all customers with demand greater than 500 kW, and to develop experiments in time-of-use pricing for smaller customers.

In December 1975 PG&E filed Application No. 56124 which proposed that time-varying rates be applied to all large industrial customers with demands in excess of 4,000 kW. Rate Schedule No. A-17 (now Schedule No. A-23) was approved in November 1976 and became effective in February 1977. In November 1977 PG&E filed Application No. 57666 which requested the authority to extend time-of-use pricing to industrial and commercial customers with demands between 1,000 and 4,000 kW. The resulting tariff, Schedule No. A-22, was approved in July 1979 in Decision No. 90588. Presently, PG&E has time-of-use rates for nearly 800 customers (A-22 and A-23) each with created demands in excess of 1,000 kW. These customers represent almost 15 percent of PG&E's summer peak load.

PG&E's original Application No. 58089 was filed in May 1978. No action was taken on that application pending the outcome of Application No. 57666 (Schedule No. A-22). After Decision No. 90588 resolved certain issues for Schedule No. A-22 customers with demands between 1,000 and 4,000 kW, PG&E amended Application No. 58089 to bring the proposed Schedule No. A-21 rates to present revenue levels and to incorporate rate design principles contained in Decision No. 90588. Application No. 58089 was amended again on April 28, 1980 to reflect rate levels found reasonable in Decision No. 91107.

PG&E has had time-of-use rates in effect for customers with demand in excess of 4,000 kW since December 1976 and for customers with demand above 1,000 kW since July 1979. SCE and SDG&E time-of-use rates for their largest customers have been in effect since August 1977. Both companies, like PG&E, extended such rates to the "over 1,000 kW" group in 1979. Sierra Pacific Power Company, CP National Utilities Company, and Pacific Power & Light Company also have time-of-use rates for their large industrial customers. The current time-of-use customers consume approximately a third of all the energy generated by these utilities.

Because some rates have been in effect since 1976, we have had an opportunity to examine the experiences of affected customers over several years. In the implementing decision for its first time-of-use schedule, PG&E was ordered to report annually on the effects of the rate. The third annual report, filed recently with the Commission, describes several findings from the experience of 140 customers with demands greater than 4,000 kW. First, PG&E found that there had been a reduction in on-peak energy usage and class coincident demand. Also, PG&E determined that demand reduction was primarily attributable to the time-of-use rate and the customer's level of output. Finally,

PG&E found that all customers did not respond equally; rather, the actions of some selected types of industrial end-usage customers caused the class response. PG&E's experience strongly demonstrates the conservation potential of electric rates which track the marginal cost of service.

Time-of-use rates designed by using marginal cost ratemaking principles provide an important incentive to customers to shift their usage to periods of other than peak demand.

PURPA

Consistent with both the findings in our Decision No. 85559 and the provisions of the Public Utility Regulatory Policies Act of 1978 (PURPA), we intend to consider the further implementation of time-of-use rates to the extent these rates are cost-effective. PURPA defines time-of-use rates as cost-effective if the long-run benefits to the utility and its customers exceed the metering and other additional costs of implementation.

The goals of PURPA are set forth in Section 101 of the Act as follows: conservation, efficiency, and equity. To meet these goals Section 111 of the Act directs state regulatory authorities to consider certain ratemaking standards. Among these standards are seasonal rates, if sufficient cost differentiation exists, and time-of-use rates, if they are cost-effective.

In its proposed Schedule No. A-21 rate, PG&E testified that sufficient seasonal variation in cost exists to justify a seasonally differentiated rate. Further, its preliminary estimates indicate that the proposed Schedule No. A-21 rate will induce a load shifting time-of-use response from the customers thereby achieving both efficiency and equity. Therefore, PG&E believes the consideration and subsequent implementation of Schedule No. A-21 will be a step toward the eventual fulfillment of the broad general mandate of PURPA.

Proposed Schedule No. A-21

PG&E proposes that Schedule No. A-21 be made applicable to all nonresidential customers having created demand between 500 and 1,000 kW and PG&E testified that it includes 1,304 customers presently served under Schedules Nos. A-12, A-13, and PA-1. The approximately 100 former Schedule No. A-13 customers who did not qualify for service under Schedule No. A-22 because their created demands were less than 1,000 kW will be included in the Schedule No. A-21 group. PG&E also testified that the Schedule No. A-21 customer class has an annual load factor of 49 percent. On average these customers consume 24 percent of their total summer electricity usage during the summer on-peak period. In the winter 13 percent of their total usage falls in the winter on-peak period. The daily load patterns for this class show that there is a high degree of coincidence between the timing of system peaks and the occurrence of peak loads for the Schedule No. A-21 customers.

PG&E proposed three rate design alternatives, all derived from marginal costs. The differences in these schedules result from differences in the manner in which demand and energy costs are collected.

Proposal A attempts to collect energy and demand costs through a rate in which charges are structured in proportion to marginal cost estimates. The witness stated that practical problems associated with the measurement of demands for billing purposes may inhibit somewhat the cost-tracking nature of this tariff.

Proposal B assumes that monthly billing demands measured for time-of-use periods provide adequate reflection of the manner in which production and transmission capacity costs are incurred by the utility. It also assumes that the incurrence of distribution capacity costs is not appropriately captured by time-of-use billing demand data. The rate is designed to collect distribution capacity costs through kWh charges.

Proposal C assumes that the difference within a time-of-use period between a customer's monthly maximum noncoincident demand and his system coincident demand at the time of the monthly peak is large. Generation and transmission capacity costs are charged through time-of-use energy charges. Conversely, distribution capacity costs are charged through separate demand charges.

Under all three proposals the customer charge component is the same, equal to the minimum bill for Schedule No. A-12 customers.

At the time PG&E's supervising rate engineer's testimony was prepared, he had a slight preference for the rate structure presented in Proposal C. However, in his oral testimony the witness recommended adoption of the proposal made by a Commission staff research analyst.

The marginal cost data used by PG&E in its proposals were presented by PG&E in its general rate Application No. 58545. These cost estimates were derived from a methodology developed by National Economic Research Associates, Inc. California Marginal Cost Pricing Project and PURPA have both encouraged the adoption of rates which better reflect the escalating costs of new construction and of utility operations on a time-of-use basis, and which foster conservation and improved efficiency in the use of resources. The recognition of marginal costs in the proposals is consistent with those criteria.

PG&E's rate proposals are designed to collect the current level of revenue from Schedule No. A-21 customers if there is a 10 percent peak demand and energy reduction and a 6 percent partial-peak demand and energy reduction. Lesser reductions will yield more revenues and greater reductions less revenues. If there is no shift, Proposal C would, for example, collect \$1.1 million more than class revenues of \$73.1 million.

Further, the witness testified that while there is much uncertainty regarding the degree of shift in usage that will be observed between periods, he feels that the combined incentives for this class created by the time-differentiated energy and demand charges in these Schedule No. A-21 rate proposals are at least as strong as those resulting from the recently approved rates for Schedule No. A-22 customers. Thus, in lieu of more precise information regarding the response of the Schedule No. A-21 class to these time-of-use rates, he proposes the shift assumption used in Schedule No. A-22, shifting 10 percent of on-peak billing demands and energy consumption and 6 percent of partial-peak billing demands and energy consumption to the off-peak period.

He said that, if the Commission should decide to approve rates for Schedule No. A-21 customers which include greater time-of-use rate differentials between periods than those proposed herein by PG&E, the size of the shift allowance should be increased accordingly. On the other hand, if the Commission should approve rates with differences between on-peak and off-peak periods that are less than those proposed, the size of the shift allowance should be decreased.

Rate Impact

PG&E's rate engineer further testified that, while this proposed rate structure change is designed to produce the same revenue, bills for individual customers are likely to change. Even if a customer does not change his usage, the bills he receives will probably change. There are three key factors which will determine the magnitude and direction of changes in customer bills. These factors are:

1. The customer's percentage of total monthly usage which occurs in on-peak periods.

2. The customer's monthly load factor calculated on the basis of his maximum on-peak kW demand, and
3. The rate schedule under which the customer was previously served.

In general, a customer with usage patterns similar to those for the Schedule No. A-21 class will not experience significant changes in his average cost of electricity over the year. Customers having greater than average on-peak usage will tend to receive higher bills, and those having less than average on-peak usage will tend to have lower monthly bills.

PG&E proposes to extend its current monitoring and evaluation efforts for time-of-use rate programs to include Schedule No. A-21 customers. Through these efforts, questionnaires will be developed, load data gathered, and reports generated which will be of use to itself, its customers, and the Commission in monitoring customer reactions to time-of-use rates. It anticipates that newly emerging metering devices together with its energy utilization audits will provide substantive data to the customer informing him how he may best reshape his load in order to maximize the incentives of the rate design.

PG&E's witness testified that the staff research analyst's proposal reflects marginal cost, particularly as a result of energy cost adjustment clause (ECAC) changes since filing the application and offers a better incentive to shift load than PG&E's proposals. He further testified that the rate alternative is understandable, administratively feasible, makes economic sense, and can be readily implemented. This is further discussed under staff witnesses.

Customer Survey

PG&E's rate economist testified that Schedule No. A-21 customers represent a broad range of industrial and commercial processes. The most prominent categories are food and kindred

products, oil and gas extraction, agriculture production, lumber and wood products, general merchandise stores, electronic equipment, and educational services.

The rate economist testified that PG&E has recently completed a market research survey of selected Schedule No. A-21 customers to generate descriptive data on class usage patterns and to anticipate likely customer reactions to time-of-use rates. Electrical usage of Schedule No. A-21 customers is highest in the afternoon hours during the months of July, August, and September. The largest generic end-use is production machinery, while lighting, air-conditioning, cooling and heating also account for a large portion of the total load. When asked to associate peak usage with generic end uses, 40 percent of the customers surveyed ascribed their respective peak demands to air-conditioning requirements. Twenty-six percent related this variation to a peak in operations and seasonal fixed output constraints, while 11 percent related peak usage to additional heating needs.

The surveyed customers list labor force complications as the single most serious impediment to adjusting on-peak operations. Seventy percent associated a significant shift in operations with difficult labor problems. Accordingly, manufacturers exhibited the greatest concern, while retail stores were almost as cognizant of potential labor difficulties in response to the prospect of rescheduled operations. Seventy-four percent of the manufacturers and 69 percent of the retail stores reported a large degree of labor-intensiveness which may tend to preclude easy adjustment to time-of-use rates. Nonetheless, a large portion of the customers sampled claimed that their operations were sufficiently flexible to shift a significant portion of the load, provided there was economic motivation to do so. ✓

Annual class coincident load factor for customers with demands between 500 and 1,000 kW is considerably less than that for

customers above 4,000 kW, 48.86 percent and 73.3 percent, respectively. Schedule No. A-21 customers thus tend to use relatively more energy in on-peak periods than do Schedule No. A-23 customers.

The witness testified that the rate forms submitted in this application are designed to better track costs, and any induced shifting is simply a beneficial byproduct of those rate designs. Since tariffs that are time-differentiated inherently track costs better than rates that are not, the proposed A-21 schedules are fair.

The demand charge in Proposal C for the summer on-peak period is 1.23 times greater than in the summer partial-peak period. The winter partial-peak ratio is 1.18:1. The time-of-use incentive is especially retained in the energy portion of the rate schedule. The energy charge for summer on-peak usage is 33 percent greater than the partial-peak charge and about 75 percent greater than the off-peak energy charge. The winter on-peak energy charge is 25 percent greater than the partial-peak charge and over 40 percent larger than the off-peak price. If customers rearrange their on-peak capacity requirements and/or reduce or shift their total energy consumed, they will be able to reduce their bills.

Staff Proposals

The staff research analyst testified that two staff reports are being presented to discuss two very different interpretations of the purpose of time-of-use rates. One purpose would be to attempt to force a given level of load shifting to occur. The other purpose would be to produce a cost-effective level of load shifting through the use of marginal cost-based rates. ✓

The witness stated that the reflection of marginal costs is the purpose of time-of-use rates and that load reduction decisions

should be made by customers based on the utility's cost of meeting that load. Load reduction goals should not be set. Her recommended rate design, (Exhibit No. 3, Table 3-A) which was adopted by PG&E during the hearing, is based on the marginal costs adopted by the Commission in Decision No. 91107, PG&E's last general rate proceeding. The rate proposal is designed to reflect marginal costs after ECAC is added to the base rates. The proposed rates provide greater bill reductions to customers who shift load than the PG&E proposal. Further, the recommended rate design provides the best interface with Schedule No. A-22 by ensuring that customers will not deliberately increase their demand so that they will qualify for another rate schedule.

This rate design uses the Schedule No. A-22 energy rates as a lower limit for the Schedule No. A-21 rates. The majority of the remaining revenue requirement is then collected from the on-peak energy rates in order to reflect the increased capacity costs in those periods. The recommended rate approximates the marginal customer costs in the customer charge and reflects some distribution-related demand costs through a nontime-varying maximum demand charge. The rate design, like PG&E's, is based upon 10 percent/6 percent demand and energy shift from peak-partial peak to off-peak.

The staff engineering witness recommended using PG&E's sales level estimates for Schedule No. A-21 without assumption of a load shift. He stated that with a 2 percent expected shift and with the estimates not likely to be accurate within 2 percent that such procedure is justified.

The witness testified that time-of-use rates tracking marginal costs or even rates set at full marginal cost do not appear to offer an adequate incentive for energy users to shift load. The witness further stated that if marginal cost-based rates do not bring about the desired results, one should look to other means for

obtaining the objective. He stated that the primary objective of time-of-use rates is the reduction or shifting of load from on-peak to other time and that marginal cost pricing is not to be the only principle on which the rate design may be based. During cross-examination he stated that the goal of reflecting marginal costs in time-of-use rates is secondary to the goal of shifting load. He stated that all customers may not be able to shift load and recommended that those who do not shift should pay higher rates so that those who do shift can receive a rate reduction. He concluded that the utility's present reporting procedures are inadequate and unsatisfactory.

Further, the engineering witness proposed rates to be adopted in conjunction with a specified discount schedule. He stated that customers who reduce their on-peak demand for a specified percentage of their reference demand will be given a discount on their total monthly bill (excluding the customer charge). A 5, 10, and over 15 percent reduction in prior on-peak demand would yield a 10, 20, and 30 percent discount.

Case No. 9804

In Decision No. 85559 dated March 16, 1976 in Case No. 9804, our generic investigation into electric utility rate structures to encourage conservation, we found:

- "1. The term 'conservation of electricity' encompasses any one or any combination of the following elements:
 - (a) The reduction in wasteful kilowatt-hour usage of electricity.
 - (b) The overall reduction of kilowatt-hour usage of electricity.
 - (c) The reduction of peak demands upon electric utility systems"

* * *

"30. Time-of-day pricing which reflects the costs of producing electricity at daily demand peaks should be required on rate schedules covering large usage customers where substantially all the necessary metering equipment already exists. In furtherance of this finding the respondent electric utilities should be ordered to file specific time-of-day pricing tariffs by applications or advice letters for review by the staff and interested parties prior to implementation."

* * *

"13. Experimentation with discount rates based on past usage would be impractical."

Time-of-Use Rates 1,000-4,000 kW

By Decision No. 90588 dated July 31, 1979 in PG&E's Application No. 57666, we ordered PG&E to file Schedule No. A-22, time-of-use rates for customers with demands between 1,000 kW and 4,000 kW. PG&E was directed to furnish such customers upon request with visual demand metering or other display equipment. Further, PG&E was ordered to file semi-annual reports showing distribution of sales and revenues with respect to time-of-use and billing periods so the effects of our order can be analyzed and possible modification considered.

In Decision No. 90588 we stated:

"The purpose of time-of-use rates is to encourage customers to shift energy usage from peak to partial-peak and to off-peak periods, thereby postponing the need for new generating facilities, which directly equates to savings for all PG&E ratepayers because new construction of generating capacity is reduced and less fossil fuel is required for peak demand period generation. . . .

"It is anticipated that there will be an overall reduction of 10 percent in the on-peak demand and energy usage and a 6 percent reduction in partial-peak demand and energy usage by the customers affected, and that the reduction in on-peak and partial-peak energy usage will be shifted to the off-peak. The increased basic revenue requirement for Schedule A-22 pursuant to Decision No. 89319 in Application No. 57284 issued September 6, 1978 is \$90,524,000. No increase in such revenue requirement is provided in this decision. The increase in revenues from those customers whose charges are increased by the time-of-use rates in Schedule A-22 will be offset by the decrease in revenues from those customers who avail themselves of the incentives to shift their energy usage from on peak and partial peak to off peak."

With respect to load shift, we further stated:

"We do not find the experience with A-23 necessarily inconsistent with our prior assumptions. One would expect the reduction in peak-period usage to be increased over time and the A-23 rate had been in effect for only one year at the time of the analysis. In addition, increasing the peak to off-peak differential as we have done for A-22 should encourage more shifting of load away from the peak period.

"For these reasons and also for purposes of stability of the applicant's revenues, we will continue to expect a reduction of 10% in the on-peak demand and energy usage. Further, based on the results of the analysis of A-23 usage patterns, we will assume that there will be a 6% reduction in partial peak demand and energy usage. The off-peak energy usage is assumed to increase by an amount corresponding to the reduction in the peak and partial-peak periods."

Position of PG&E

PG&E supports the adoption of the staff research analyst's preferred Schedule No. A-21 because the utility believes that such proposal is in keeping with its rate design goals. After including ECAC changes since filing the application, it appropriately reflects marginal costs, and it offers a better incentive for load shifting than the utility's original proposal.

PG&E recommends that we reaffirm that conservation as the efficient allocation of electricity is the keystone of the rate **STRUCTURE** and that marginal cost pricing is the purpose of time-varying rates, i.e., time-varying rates are designed to reflect marginal costs. PG&E correctly states that its request for reaffirmation is not inconsistent with the two references to decisions made in the staff argument and hereinafter quoted.

The utility cites our decision in Case No. 9804 and cross-examination in this proceeding in support of its recommendation to reject the discount rate proposal. Further, it recommends the 10 percent/6 percent load shift assumption in designing rates. The utility states that the staff analyst's rate design has a greater incentive for shift compared to existing Schedules Nos. A-22 and A-23 and that proposed Schedule No. A-21 applies to a different class of customers with lower load factors and different and more end uses including air-conditioning.

PG&E recognizes that collection and reporting requirements need further work. PG&E recommends that we order it to meet with representatives of the staff divisions to review data available, data that can be produced, the timetable and cost of producing such data, and then to specify guidelines as to what is required of PG&E. PG&E can report data as set forth in the staff argument.

Staff Position

The staff did not believe that PG&E's data responses prior to hearing were adequate. Its data collection recommendation is as follows:

"Within 180 days after Schedule No. A-21 authorized in this order shall take effect, Pacific Gas and Electric Company shall commence filing with the Commission semiannual reports on the operation of this schedule. These reports shall show distribution of sales and revenues with respect to time of use and billing periods."

On behalf of its engineering witness, the staff recommends the Commission adopt his proposal: discount rates for reductions from prior usage and no load shift assumption.

In argument, the staff quoted from two of our decisions as follows:

"First, in SoCal Edison's Application 57653, Decision 90146, dated April 10, 1979, at mimeo page 4, we find the following language:

"The objectives sought to be achieved by TOU rates is a shift in electrical usage from peak periods of high demand to time of lesser demand, so as to improve load factors on existing electrical plant, and thereby possibly negate or postpone the necessity of construction of high cost additional plant: In other words, to promote optimum use and efficiency of existing plant.

"The second decision was PG&E's own Application 57666, Decision 90588, dated July 31, 1979, and at mimeo page 10 the following language is found:

"A time of use rate is a load management technique.

"If effective, it will provide an economic incentive to transfer electric usage from the higher to the lowest time of use, thereby postponing the need for new generating facilities."

Further, the staff states that its witness followed the principles in the above quotations. Furthermore, on behalf of this witness, the staff recommends not more than a 2 percent shift assumption from on-peak to off-peak.

On behalf of its research analyst, the staff recommends her preferred proposal. The staff notes that it was adopted by PG&E.

CRA Position

The CRA believes that it is not Commission policy and the staff engineering witness is wrong when he states that the principal purpose of time-of-use rates is to achieve a specified level of shift in demand or consumption. CRA states, with reference to the two decisions quoted by staff in argument for this proposal, that you have to look at what the Commission did. They are quite certain that we did not sever rates from costs. CRA states that the purpose of time-of-use rates is to track costs.

CRA argues that if we were to adopt such a staff proposal, we would be called upon to decide how large a shift and how large a differential between peak and off-peak rates. We would then be faced with the argument that inability to shift would be ground for exemption from time-of-use rates. CRA asked that the staff-proposed discount rates be rejected now as they were in Decision No. 85559.

CRA also states that the record does not support the 10 percent/6 percent shift. CRA contends that the record shows that it takes time to shift and that such a magnitude of shift has not yet been reported for the present time-of-use rate customers. It cites PG&E's customer survey which shows that 66 percent of the customers sampled disagreed with the proposition that the processes involved in their businesses were such that operations could be modified to time periods other than 12 noon to 6 p.m.

The difference between a 10 percent/6 percent shift and a 5 percent/3 percent shift is about \$1.2 million in class revenue.

The difference between a 10 percent/6 percent shift and 0 percent is about \$2.5 million, or equivalent to 3 percent of class base revenues and 1 percent class total revenues.

With respect to rate design, CRA recommends using the staff research analyst's cost figures. CRA recommends setting the energy rate at the research analyst's full marginal cost, opposes the \$1/kW maximum demand charge, and recommends a small customer charge. It recommends rolling demand costs into the energy rate in proportion to occurrence to the extent necessary to recover the full revenue requirement. This generally corresponds to the staff proposal. CRA also recommends a 0 percent shift assumption.

Position of TURN

TURN recommends against a 10 percent/6 percent shift assumption noting PG&E's testimony about its largest time-of-use rate customers. They have had only a 2.7 percent system coincident peak shift and a 4.5 percent noncoincident shift. TURN considers 2.7 percent the more appropriate to use; however, PG&E correctly points out that customers are billed on their own peaks, whether coincident or not. Since the actual shift was less than the 10 percent/6 percent shift assumed for the rate design, actual class revenues were greater than test year class revenues. PG&E testified this difference over the past three years totals \$1.5 million per year. TURN states that these kinds of overcollections should not be tolerated. In light of the overcollections on Schedule No. A-23, TURN recommends a 0 or 2 percent shift assumption.

TURN joins all the other parties in supporting the need for data reporting by the utility. It also states that a staff

audit or study should be made before accepting PG&E's data such as class revenue.

Discussion

It is our intention to continue to bring more customers under time-of-use rates that more closely follow costs and could result in conservation of energy.

PG&E has identified 1,304 medium light and power customers with demands from 500 kW to 1,000 kW that will be brought under time-of-use rates in new Schedule No. A-21. For these customers there are basically two time-of-use rate proposals before us. One reflects marginal costs and the other offers discounts for reductions from prior usage or load reduction goals.

The purpose of time-of-use rates is to produce cost-effective levels of load shifting. In Decision No. 85559 we defined energy conservation as the elimination of any use of electricity which is not worth to customers what it costs to produce. We also determined that conservation in the sense of efficient allocation of electricity will be the keystone to the rate structure. We now say it again. Further, in Decision No. 85559 we reviewed the deficiencies associated with discount rates and rejected their use. We are still of the opinion that discount rates are not practical or fair.

In Decision No. 90475 dated June 19, 1979 in an SCE time-of-use rate proceeding we said:

"In Decision No. 85559, issued March 16, 1976, we made the following finding of fact:

- "25. Time-of-day pricing would likely produce rates that more closely follow costs and it could result in conservation of energy. The energy conservation would be a function of the relative efficiency of the generating equipment dispatched to cover peak loads as compared to that of equipment in use off peak." (D.85559, p. 81 mimeo.)

"Simply stated, it costs more to produce electricity during periods of peak demand than during periods of lesser demand. To be equitable, rates should be designed in such a way as to reflect this difference. Under TOU rates some customers, but not all, will shift a portion of their peak period usage to periods of less than peak demand, because their rates will be lower. Those customers who do not or cannot shift, and who thus use more peak period electricity, will pay proportionately more, based on the greater cost of peak production. TOU rates are also expected to achieve a conservation effect in the sense that reduced peak demand will defer the necessity for new peak-load generating capacity. Such deferral will in turn result in lower rates to all customers than would be the case if new generating facilities were added."

The staff research analyst's preferred rate proposal, as hereafter adjusted for load shift, properly reflects marginal costs recognizing revenue constraints, is reasonable and will be adopted.

The estimated base rate revenue requirement of \$73.1 million to be recovered from the new Schedule No. A-21 customers properly reflects the requirements authorized in Decision No. 91107, PG&E's last general rate proceeding, and is just and reasonable.

Time-of-use rates have resulted in a 4.5 percent reduction in billing demands for Schedule No. A-23 customers (demands over 4,000 kW). No credible evidence exists to demonstrate that the Schedule No. A-21 customers will shift 10 percent peak demand and energy and 6 percent partial-peak demand and energy. If we base the new time-of-use rates on the 10 percent/6 percent shift proposed and it does not materialize, PG&E will collect greater revenues than under nontime-of-use rates.

The new schedule will provide incentive for a shift in customer use of energy and demand. It is not possible to determine the exact shift without data based on experience.

A 5 percent/3 percent shift has been imputed for the other large electric utilities in California. It is reasonable to assume that there will be a 5 percent decrease in on-peak demand and energy, a 3 percent decrease in partial-peak demand and energy, and an increase in the off-peak energy corresponding to the sum of the on-peak and partial-peak energy reductions. Therefore, a 5 percent/3 percent shift from peak/partial peak is reasonable and is adopted for the new schedule.

The new schedule provides the best interface with Schedule No. A-22 by ensuring that customers on Schedule No. A-21 will not deliberately increase their demand to qualify for Schedule No. A-22.

Some customers should receive increased bills, and some should receive decreased bills. A typical customer with a distribution of usage similar to class as a whole after a 5 percent/3 percent shift should receive no increase. The new time-of-use rate schedule adopted should recover about the same revenue level authorized for these customers in Decision No. 91107.

The customers served under Schedule No. A-21 who use energy during periods of peak consumption on the PG&E system contribute to the additional incremental expense required to maintain and operate peak-period generating capacity. If those Schedule No. A-21 customers who either are unable or are unwilling to shift usage to off-peak periods are charged the higher rate authorized herein, they will bear a portion of the expense required to generate the incremental peak-demand capacity necessary to serve them. It would not be appropriate to exempt users with inflexible load characteristics from time-of-use schedules. It is proper that the costs at the time-of-use be borne, to the extent possible, by those who use the service.

PG&E's monitoring and reporting practices on its time-of-use rate schedules have not been adequate to assess the shifting of demand and energy and level of revenues. The collection and analysis of time-of-use data are complex and time-consuming processes. Reasonable requirements should be developed on data collection and analysis. Representatives of the staff and utility should meet to agree upon these requirements.

The record shows that Schedule No. A-23, (customers over 4,000 kW of demand) was designed with a 10 percent/6 percent shift assumption. The reported shift has been less. Therefore, collected revenues have been greater than the estimated class revenues. The rate level for this class was most recently set in our Decision No. 91107 dated December 19, 1979 in PG&E's 1980 test year general rate proceeding. Balancing accounts are not appropriate for time-of-use rate schedules. PG&E and the staff should be required to thoroughly examine the problem of over- and under-collections on all time-of-use schedules in the next general rate proceeding.

It is reasonable to require that the utility provide a visual display meter or other display devices on request of the customer. The costs of such meters or devices like other facilities necessary to render the service should be recovered through rates authorized under Schedule No. A-21.

Findings of Fact

1. Decision No. 85559, Case No. 9804 dated March 16, 1976 found that time-of-use rates may reduce peak loads (see Findings 20-25) and directed respondent utilities, including PG&E, to present time-of-use rate proposals.

2. In Decision No. 85559 we define energy conservation as the elimination of any use of electricity which is not worth to consumers what it costs to produce. We also determined that conservation in the sense of efficient allocation of electricity is to be the keystone of the rate structure.

3. The purpose of time-of-use rates is to produce cost-effective levels of load shifting.

4. Load reduction decisions should be made by each customer based on its response to time-of-use rates reflecting marginal costs. Load reduction goals should not be established.

5. Time-of-use schedules for PG&E customers over 4,000 kW and between 1,000 and 4,000 kW were authorized by Decision No. 86632 dated November 16, 1976 and Decision No. 90588 dated July 31, 1979, respectively.

6. By letter dated March 24, 1978 we requested PG&E to implement time-of-use rates for its customers having loads between 500 kW and 1,000 kW.

7. PG&E filed its application for 500 kW to 1,000 kW customers on May 23, 1978, and amended it December 14, 1979 and April 28, 1980.

8. Establishment of time-of-use rates for medium light and power customers to be served under Schedule No. A-21 with demand between 500 kW and 1,000 kW should result in reducing system peak-load requirements.

9. The 1,304 identified customers served by PG&E with monthly maximum demands between 500 kW and 1,000 kW represent a broad range of industrial and commercial processes. These include food products, oil and gas extraction, agriculture, lumber and wood products, merchandise stores, electronic equipment, and educational services.

10. In Decision No. 85559 we reviewed the numerous deficiencies associated with discount rates and based on these deficiencies rejected

their use. We affirm our conclusion that discount rates are unfair, inequitable, and impractical.

11. The staff-preferred Schedule No. A-21 rate proposal contained in Exhibit 3, when adjusted to 5 percent on-peak shift and 3 percent partial-peak shift of demand and energy, properly reflects marginal costs recognizing existing revenue constraints and will be adopted.

12. The revenue requirement to be met through basic rates in this schedule is \$73.1 million, is just and reasonable, and properly reflects the revenue requirements authorized in Decision No. 91107.

13. The adopted rate will recover approximately the same revenue as contemplated in Decision No. 91107 from customers that will be served under Schedule No. A-21. This schedule conforms to the guidelines for time-of-use rate structures established by the Commission.

14. Schedule No. A-21 will provide an incentive for a shift in customer use and demand of electricity. The exact amount of shift is impossible to ascertain without data based on experience. It is reasonable to assume that there will be a 5 percent decrease of the on-peak demand and energy usage, a 3 percent decrease in the partial-peak demand and energy usage, and an increase in the off-peak energy usage corresponding to the addition of the on-peak and partial-peak energy reductions.

15. Customers served under Schedule No. A-21 who use energy during periods of peak consumption on the PG&E system contribute to the additional incremental cost required to maintain and operate peak-period generating capacity.

16. If those Schedule No. A-21 customers who either are unable or unwilling to shift usage to off-peak periods are charged the higher rate authorized herein, they will bear a portion of the cost required

to generate the incremental peak demand capacity necessary to serve them.

17. It would not be appropriate to exempt users with inflexible load characteristics from time-of-use schedules. It is proper that the costs at the time-of-use be borne, to the extent possible, by those who use the service.

18. A visual display meter or other display devices would provide the customer with timely information on his current use.

19. It is necessary for PG&E to provide the Commission with additional data and analyses for efficient monitoring of the performance of time-of-use rate schedules.

20. The collection and analysis of data are complex and time-consuming processes. Therefore, reasonable requirements should be developed for such collection and analysis.

Conclusions of Law

1. The rates authorized in the following order are just, reasonable, and nondiscriminatory.

2. PG&E should be directed to furnish customers served under Schedule No. A-21 with a visual display meter or other display equipment on the customer's premises at his request.

3. PG&E should be directed to file periodic reports on the operation of its Schedule No. A-21 so the effects of the following order can be analyzed and possible modifications considered.

4. PG&E and the staff should be directed to meet and to set reasonable requirements for the collection and reporting of time-of-use rate data.

5. PG&E should be directed to file Schedule No. A-21, attached hereto as Appendix A, which is designed to produce \$73.1 million base revenue with a 5 percent/3 percent shift assumption from on-peak/partial-peak demand and energy, and an increase in off-peak energy usage corresponding to the on-peak and partial-peak energy reductions.

6. PG&E and the staff should be directed to thoroughly examine load shifting, conservation, and revenue on all time-of-use schedules in the next general rate proceeding.

O R D E R

IT IS ORDERED that:

1. Pacific Gas and Electric Company (PG&E) is directed to file with the Commission, not later than five days after the effective date of this order, in conformity with the provisions of General Order No. 96-A, new tariff Schedule No. A-21 with rates, charges, and conditions modified as set forth in Appendix A attached to this order and, on thirty days' notice to the public and to the Commission, to make the revised tariffs effective. It is authorized to make such rates effective as to the individual customers affected on the dates of the reading of the customer's meter on or after the effective date of the tariff.

2. PG&E shall include in its Schedule No. A-21 a statement specifying that a visual display meter or other display equipment will be furnished and installed within one hundred and eighty days after request by the customer.

3. Tariff filings required or authorized by paragraph 2 of this order shall be made by advice letter, and such letter shall set forth the data upon which the specific rules and charges set forth therein are based.

4. PG&E shall file with the Commission semiannual reports on the operation of Schedule No. A-21 so the effects of the order can be analyzed and possible modifications considered. The reports shall include data segregated with respect to time-of-use and season.

5. PG&E and the Commission staff shall meet to set reasonable requirements for the collection and reporting of time-of-use rate data.

6. PG&E and the Commission staff shall thoroughly examine load shifting, conservation, and revenue on all time-of-use rate schedules in PG&E's next general rate proceeding.

The effective date of this order shall be thirty days after the date hereof.

Dated DEC 30 1980, at San Francisco, California.

John E. Byron
President

Richard D. Grumley

Clifford J. ...

Leonard W. ...
Commissioners

Commissioner Vernon L. Sturgeon, being necessarily absent, did not participate in the disposition of this proceeding.

A.58089 ALJ/ec

GENERAL SERVICE-TIME METERED

APPLICABILITY

This schedule is applicable to polyphase alternating current service for all existing customers served under a nonresidential schedule whose monthly demand, in any time period was 500 kilowatts or greater for three consecutive months, and to new customers on and after the effective date of this schedule whose monthly maximum demand is expected to be 500 kilowatts or greater. New customers may, at their option, elect to be served under any other applicable schedule until their monthly maximum demand in any time period is 500 kilowatts or greater for three consecutive months. Any customer served under this schedule whose aggregate diversified monthly maximum demand in any time period has fallen below 400 kilowatts for any 12 consecutive months may, at his option, thereafter elect to continue to receive service under this schedule or under any other applicable schedule. This schedule is not applicable to service for which Schedules Nos. A-22 and A-23 are applicable.

TERRITORY

The entire territory served.

RATES

	<u>Per Meter Per Month</u>	
	<u>Period A</u>	<u>Period B</u>
Customer Charge:	\$65.00	\$65.00
Demand Charge:		
Per KW of maximum demand	1.00	1.00
Energy Charge:		
On Peak, per kilowatt hour . . . . .	.050	.030
Plus Partial Peak, per kilowatt hour . . . . .	.020	.014
Plus Off Peak, per kilowatt hour . . . . .	.010	.010

Adjustments:

The above base rates are subject to possible adjustment for voltage and/or power factor. In addition, bills for service will include adjustments, as specified in Parts B and C of the Preliminary Statement as follows:

Energy Cost Adjustment	<u>per kWhr</u> \$.04063
Tax Change Adjustment . . . . .	.00000
Total	\$.04063

SPECIAL CONDITIONS

1. Time Periods:

Period A is applicable to meter readings from May 1 to September 30, inclusive, for the following hours:

On Peak	12:30 p.m. to 6:30 p.m.	Monday through Friday, except holidays.
Partial Peak	8:30 a.m. to 12:30 p.m.	Monday through Friday, except holidays.
	6:30 p.m. to 10:30 p.m.	Saturday, except holidays.
	8:30 a.m. to 10:30 p.m.	Monday through Saturday, except holidays.
Off Peak	10:30 p.m. to 8:30 a.m.	All day Sunday and holidays.

All day Sunday and holidays.

Period B is applicable to meter readings from October 1 to April 30, inclusive, for the following hours:

On Peak	4:30 p.m. to 8:30 p.m.	Monday through Friday, except holidays.
Partial Peak	8:30 a.m. to 4:30 p.m.	Monday through Friday, except holidays.
	8:30 p.m. to 10:30 p.m.	Saturday, except holiday
	8:30 a.m. to 10:30 p.m.	Monday through Saturday except holidays.
Off Peak	10:30 p.m. to 8:30 a.m.	All day Sunday and holidays.

All day Sunday and holidays.

When billing includes usage in both Period A and Period B, no proration of charges between Period A and Period B will be made where meter readings are taken within one work day (Monday through Friday inclusive but excluding holidays) of either May 1 or October 1 of any year. In such cases the billing will be based on the rates and charges of either Period A or Period B, whichever contains the predominant number of days in the billing period.

2. Holidays: The holidays specified in this Schedule include: New Year's Day, Washington's Birthday, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, and Christmas Day, as said holidays are specified in Public Law 90-363 (U.S.C.A. Section 6103).

3. Maximum Demand: The maximum demand in any month will be the maximum average power taken during any 30-minute interval in the month, but not less than the diversified resistance welder load computed in accordance with Rule No. 2; provided, that in cases where the use of energy is intermittent or subject to violent fluctuations, either a 5-minute or a 15-minute interval may be used.

4. Voltage Adjustment: The above charges are applicable without adjustment for voltage when (a) delivery is made at less than 2 kV, or (b) when delivery is made by means of Utility-owned transformers at a distribution voltage other than a standard primary distribution voltage, or (c) when delivery is made at a voltage that requires more than one stage of transformation from transmission voltage. When delivery is made at the standard primary distribution voltage at 2 kV or above available in the area from the Utility's distribution line, or where the Utility has elected to supply service at a standard primary distribution voltage from a transmission line, for its operating convenience, from Utility-owned transformers on the customer's property, the above charges for any month will be reduced by 15¢ per kilowatt of billing demand in the month. When delivery is made from an existing available transmission line (60 kV and above) without Utility-owned transformation, the above charges for any month will be reduced by 25¢ per kW of billing demand in the month where additional facilities are installed at customer's request or convenience, such facilities may be installed pursuant to Section I of Electric Rule No. 2.

5. Power Factor: The total charge for any month as computed on the above rates will be decreased or increased, respectively, by 0.1% for each 1% that the average power factor of customer's load in the month was greater or less than 85%, such average power factor to be computed (to the nearest whole per cent) from the ratio of lagging kilovolt ampere hours consumed in the month.

6. Voltage: Service on this schedule will be supplied at the voltages as described in Electric Rule 2.

7. Facility Charge: The customer shall pay any nonrefundable charges and perform any obligations that may be required under the Utility's applicable line extension or service connection rules. In addition, where the estimated installed

cost of only those new and additional facilities necessary to provide regular service is in excess of the base annual revenue to be derived under this schedule (base annual revenue excludes (a) that portion of the revenue equal to the product of the kilowatt hour usage times the net energy cost adjustment and (b) any applicable state and local taxes), and additional monthly charge of $1\frac{3}{4}$ percent of such excess installation cost will be made. If the customer elects to advance such excess installation cost to the Utility, the additional monthly charge will be 1 percent of such excess installation cost. Where the Utility's estimated installed cost of the new and additional regular service facilities does not exceed the base annual revenue, upon discontinuance of the use of such facilities, the customer shall pay the Utility, on demand, its net installation and removal cost for such facilities, except that if electric service from such facilities has been used in a bona fide manner for a period of 36 consecutive months, the customer's obligation will be reduced at the rate of $1\frac{2}{3}$ percent for each month of service in excess of the first 12 months. The customer shall pay the Utility, on demand, that portion of the Utility's net installation and removal cost in excess of the base annual revenue without regard to duration of use. Any customer advance for excess installation costs of such facilities shall be applied as a credit toward the new installation and removal costs. Further, where the customer requests special facilities which are in addition to, or in substitution for, or otherwise cause the Utility to incur additional costs above those for regular service facilities which the Utility would normally install, and the Utility determines that it is able to provide such special features, such facilities will be provided in accordance with Section I of Electric Rule 2.

8. Contract: Electric service supplied under this schedule shall be in accordance with a contract authorized by the Public Utilities Commission of the State of California. Such contract will be required for a period of three years when service is first rendered hereunder and for subsequent periods of one year each thereafter, continuing until canceled by either party by written notice one year in advance of the initial term or any subsequent term. Customers of record on August 30, 1980, served under existing contracts will continue to be served under such contracts except that following the expiration of the initial term such contracts will continue in effect for subsequent terms of one year each until canceled by either party by written notice one year in advance of the initial term

or any subsequent one-year term. If the applicant is unwilling or unable to sign a contract for an initial three-year term, service will be established under the provisions of Rule No. 13, Temporary Service.

9. Visual Display Metering: Upon written request by the customer, the Utility will, within 180 days, provide and install visual display equipment near the present meter location to operate in parallel with the magnetic tape recorder used for billing purposes. The customer shall provide the required space and associated wiring for such installation in accordance with Rule No. 16.