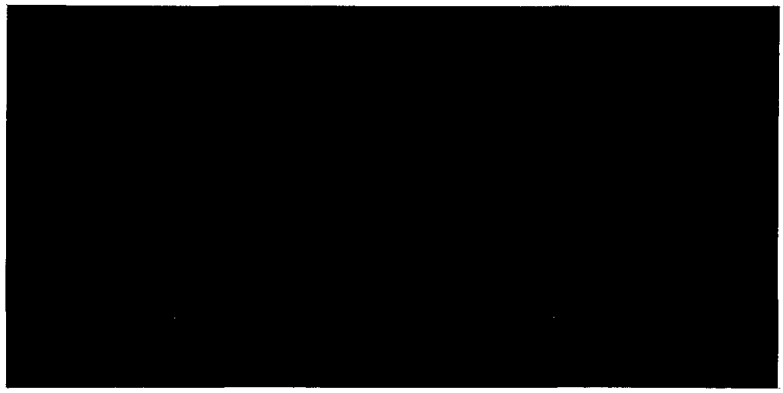
ORIGINAL

RECEIVED

2004 DEC 28 P 3:42

AZ CORP COMMISSION
DOCUMENT CONTROL

30 A1



E-01345A-04-0657
E-01345A-03-0775

ARIZONA CORPORATION COMMISSION
UTILITIES DIVISION

Arizona Corporation Commission
DOCKETED

DEC 2 8 2004

DOCKETED BY

Staff Inquiry into the Usage Estimation, Meter Reading, and Billing Practices of Arizona Public Service Company

December 28, 2004

For the Arizona Corporation Commission

Barrington-Wellesley Group, Inc.

P.O. Box 2390 • New London, NH • 03257

TABLE OF CONTENTS

CHAPTER I

Executive Summary

This chapter is organized as follows:

A. Overview
B. Evaluative Criteria and Findings and Conclusions
C. Summary of Recommendations

A. OVERVIEW

Arizona Public Service Company (APS or the Company) provides electricity to over 900,000 customers in Arizona. APS is the largest subsidiary of the publicly traded Pinnacle West Capital Corporation. Approximately eight percent of APS' 814,000 residential customers and 93 percent of APS' 101,000 non-residential customers are served through demand meters. APS believes that it has one of the largest number of demand meters of any electric utility in the country.

The Utilities Division Staff (Staff) of the Arizona Corporation Commission (ACC or Commission) retained the Barrington-Wellesley Group, Inc. (BWG) to perform an inquiry into the usage estimation, meter reading and billing practices of APS. A significant portion of this inquiry was devoted to reviewing the process of bill estimation of demand meters because demand (kW), unlike energy consumption (kWh), cannot be trued-up in a subsequent month when an actual meter reading is obtained. These issues were precipitated by the filing of a complaint by Avis Read, who was an APS customer. The complaint alleges that APS systematically failed to follow required practices and procedures regarding meter reading, estimation and billing and harmed its customers by doing so. Our review concludes that APS did not appropriately handle the Read matter from a customer service perspective; however, our analysis also found that Ms. Read's bills were underestimated rather than overestimated.

Many of the APS deficiencies identified in this report relate to the implementation of a new Customer Information System (CIS) in 1998. APS did not devote significant attention and resources to identifying and fixing the problems resulting from the implementation of the new system. In addition, APS implemented the use of a class average load factor to estimate demand as a short-term solution to a work load problem in the Billing Services Department without giving sufficient consideration to the effect of this change in policy on individual customers and the public interest. The Company was imprudent in not later re-assessing the effect of this decision. In addition, the Company was imprudent in failing to retroactively identify and credit those customers' accounts for whom it had over-billed estimated demand.

In general, APS has effective and well-controlled usage estimation, meter reading and billing processes, and has had relatively few estimated billing problems. However, the Company has not devoted adequate resources to identifying and fixing the problems that do exist within its meter reading, usage estimation and billing processes. APS appears to

have made many improvements to these processes subsequent to, and most likely in reaction to, the Read Complaint.

In the course of our investigation, it was discovered that APS has not implemented the demand estimation methodologies identified on its residential demand tariffs EC-1 and ECT-1R. In addition, APS did not notify the Commission that the demand estimation procedures being utilized by the Company were different than those described on the Company's Commission-approved tariffs.

BWG will be providing a recommendation to the Commission regarding the appropriateness of APS' methodologies at the time of filing testimony in this proceeding. At this time, we recommend that, in addition to the fifteen detailed recommendations outlined in this report, the Commission require APS to provide a quarterly report to update Staff on the status of implementing these recommendations. In that regard, the Commission should also require APS to pay for an independent auditor, selected by the Commission Staff, to independently verify APS implementation of these recommendations.

B. SUMMARY OF RECOMMENDATIONS

The fifteen recommendations included in this report are listed below. Detailed findings and conclusions supporting these recommendations are provided in the related chapters.

Monitoring and Compliance with Commission Recommendations

APS should be required to participate in a third party audit by an independent auditor selected by Staff and funded by APS. This audit would be focused on evaluating whether the Company's meter reading, billing, and estimation practices and management processes have been improved. The audit would also evaluate whether the Company has complied with the decision in this matter. The audit would take place within twelve months of a decision in this matter.

APS should be required to file an implementation plan with the Commission within sixty days of a decision in this matter that identifies how it will comply with the decision in this matter. This implementation plan should be submitted for Commission approval.

Chapter III - Meter Reading

III-1 APS should be required to provide evidence to the Commission that new procedures have been put in place to ensure that staffing resources are sufficient to address emergency short-term needs for meter reading shops that are either smaller or remote. A report that describes the new procedures and explains how they reduce the potential for "skipped" meter readings due to staffing resource issues should be provided to the Commission within six months of a decision in this matter. [Refers to Findings III-3 and III-4.]

III-2 APS should be required to revise the "No Access Meters" report, KM06R20, to provide the following additional features:

- Report the present number of consecutive months that the meter reading department could not access the meter so that the Administrative Coordinator can track the steps required for each month of access problems and prioritize the APS response.
- Report the other instances that the meter reading department was unable to read the meter during the previous twenty-four months to simplify identification of recurring "no access" problems at the same premises.
- Prioritize accounts to focus first on demand-billed customers when working the "no access" report. APS should compile and maintain these reports for purposes of the independent audit. [Refers to Finding III-9]

III-3 APS should develop and install a performance measure to monitor the extent to which APS is complying with the Commission requirement to read meters each month (no less than twenty-five days after the last meter read and no more than thirty-five days after the last meter reading). APS should provide to the Commission a description of its performance measure and the results of its analysis within six months of a decision in this matter. [Refers to Finding III-9.]

III-4 APS should change the options settings in the Itron software in all locations so that the Itron HHC used by meter readers in each of the APS meter read shops no longer includes the last month's usage and last month's meter reading. This feature should be disabled throughout APS' service territory within 30 days of a decision in this matter. [Refers to Finding III-10.]

III-5 APS should provide the Commission with quarterly reports related to the status of the remote meter reading pilot and implementation plans. The reports should provide a description of the meter reading technology being implemented, APS' plan for implementation, the number and type of customers involved in the pilot program, the costs associated with its implementation, and the operational efficiencies associated with its implementation. [Refers to Finding III-11.]

III-6 APS should implement a pilot program to evaluate whether using an auto-dialer to communicate with "no access" account customers prior to the scheduled read date, in addition to the other methods presently used, will facilitate resolution of additional "no access" accounts. The Company should maintain records on the number of instances that the auto-dialer is used to call customers in these circumstances so that one may determine whether use of the auto-dialer improves APS' access to "no access" meters. The results of the pilot program should be reported to the Commission in quarterly reports. [Refers to Finding III-12]

III-7 APS should implement a pilot program to evaluate whether scheduling appointments with "no access" account customers results in a reduction of estimated reads due to "no access" problems. The results of the pilot program should be reported to the Commission in quarterly reports. [Refers to Finding 12]

III-8 APS should be required to implement a policy to ensure that meter reading supervisors periodically inspect meter locations reported as "no access" to verify that appropriate corrective measures are taken. APS should be required to file a

copy of this policy with the Commission within ninety days of a decision in this matter. [Refers to Finding III-12.]

Chapter IV - Usage Estimation and Billing

IV-1 APS should be required to obtain Commission approval of its estimation procedures as a tariff filing. [Refers to Finding IV-7]

IV-2 APS should evaluate the extent to which customers were over-billed or under-billed during the period 1998-2003. APS should identify those customers who are due credits because their estimated demand was not adjusted downward when the actual demand read came in less than the estimate. APS should also be required to provide a credit to customers who were over billed. Within ninety days of a decision in this matter APS should file a report that details the results of its analysis and identifies mechanisms by which it could provide refunds to customers who were overbilled. [Refers to Finding IV-8.]

IV-3 APS' Audit Services Department should include on-going testing of usage estimation, meter reading and billing practices in its annual audit plan. APS should also ensure that it has completely implemented any findings reported in previous audit reports. APS should file the results of its internal audits with the Commission. [Refers to Finding IV-11]

Chapter V. - Comparative Practices

V-1 APS should take steps to obtain actual meter readings at customer premises that have persistent "no access" problems. The Company's established practice does not include scheduling a meter reading at other than normal business hours or making an appointment for a meter reading. [Refers to Finding V-2]

V-2 APS should continue to participate in benchmarking studies that compare its practices to other utilities in the industry. APS should provide such benchmarking analysis to Staff on a quarterly basis. [Refers to Finding V-6]

Chapter VI. - Avis Read Complaint

VI-1 APS should be required to train Billing Services Representatives (BSRs) and others involved in the usage estimation, meter reading and billing process to understand that customers value an accurate bill more than an underestimated bill. APS should also train them to recognize situations in which the underestimation of usage may result in problems for their customers. APS should provide Staff with a description of the changes to its training process within six months of a decision in this matter. [Refers to Finding VI-1.]

VI-2 APS should be required to provide a clearer notice on a re-billed account. Such notice should clearly state that the new bill replaces the previously issued bill and that the customer should only pay the reissued bill amount. APS should consult with Staff in determining the appropriate language and placement on the bill within 30 days of a decision in this matter. In addition, APS should be required to

make the appropriate modifications to its billing system to implement this change within sixty days of a decision in this matter. [Refers to Finding VI-2.]

Compliance with ACC Rules and Tariff Provisions

We recognize that there are legal issues surrounding the validity of A.A.C. R14-2-210, the Commission's rule addressing estimation. BWG's analysts in this matter are not attorneys, and this report does not analyze the legal issues that may be presented by Rule 210. If the Commission were to determine that Rule 210 is both valid and applicable to APS, the following facts would appear to support a conclusion that APS has violated Rule 210.

- APS did not file a complete set of estimation procedures for Commission approval.
- APS failed to notify the Commission when it changed its demand estimation methodology to include the use of class average load factors.
- APS failed to send Avis Read a bill for a six-month period in 1999 and 2000.

Also, the following facts would appear to support a conclusion that APS violated its Commission approved tariffs.

- According to APS, the Company never implemented the Commission approved practices for estimating demand on Rate Schedules EC-1 and ECT-1R.
- At no time did APS notify the Commission that the methodologies the company was using to calculate estimated residential demand were different than described on EC-1 and ECT-1R.
- APS failed to notify the Commission when it changed its demand estimation methodology to include the use of class average load factors.

Purpose of Staff Recommendations

The recommendations in this report are designed to provide remedies to customers who may have been over billed, to provide notice to APS that it has not complied with Commission rules and tariffs, and to establish reporting and other obligations for APS so that the Commission may address these issues. Staff is evaluating additional potential remedial actions including imposition of fines, refunds, and other monetary penalties and will address this in subsequent testimony. Associated quantification of over billing, if any, will also be included in subsequent testimony.

In order to monitor compliance with a decision in this matter, APS should be required to participate in an independent audit. If at any time, APS' actions are inconsistent with the Commission's decision in this matter, the Company should be subject to further remedial action.

C. EVALUATIVE CRITERIA and FINDINGS and CONCLUSIONS

In this section, we first provide the criteria that we used to evaluate APS' performance, and then provide our specific findings and conclusions with respect to the criteria. Details supporting each finding and conclusion are provided in the respective chapters.

Meter Reading (Chapter III)

1. Are meter reading resources sufficient to ensure that meter readings are completed on a timely basis?

Generally yes. However, APS has not provided evidence that staffing resources are sufficient to address emergency short-term needs for meter reading shops that are either smaller or remote. Despite the existence of the supplemental hiring hall resources, which are not designed for immediate short-term needs, situations occur in which back-up meter reading resources are not always available.

- APS has not had significant cutbacks in meter reading-related expenditures that might have contributed to increased levels of estimated bills.
- Over the period from 1995 to 2004, meter reading headcount increased by almost 30 percent, from 111 to 158, although part of the increase in staffing levels in 2004 was due to changing job responsibilities that shifted certain activities from the service department to the meter reading department.
- While management represents that all meters are read monthly except for those that cannot be read due to access problems or safety concerns, meter reads are not obtained (i.e., "skipped") on occasion due to the unavailability of meter reading resources.
- The lack of sufficient meter reading resources to ensure that meter readings are never "skipped" does not appear to be due to planned cut-backs in the number of full-time meter readers. "Skipped" meter readings occur because back-up meter reading resources are not always available, despite the existence of the supplemental hiring hall resources (which are not designed for immediate short term needs). While the number of "skipped" reads can likely be reduced, based on our experience, the number of "skipped" reads does not appear unreasonable compared to industry practices.
- While BWG is not aware of any comprehensive meter reading benchmarking studies, APS has participated in some benchmarking or productivity studies performed by various consultants that compared the performance of the meter reading processes among several utilities. The average number of meters read per month per employee for electric utilities participating in one study was 6,382. The highest performing company in the study read 12,182 meters per employee per month.[1] Assuming that APS reads each of its approximately 1,025,000 meters

[1] Downloaded from http://www.newpower.com/p040824a.html on December 19, 2004

each month, the annual average number of meters read each month per APS meter reader is about 6,487 meters.

2. Are adequate controls in place to ensure that meter reading routes are being read on a timely basis?

Yes. However, APS was unable to provide sufficient information to enable BWG to analyze or trend the completeness or timeliness of meter reading for the period of 1995 to 2004.

- APS generally has well documented processes and procedures for meter reading, and it actively tracks meter reader performance.
- APS prescreens meter readers before hiring and provides them both computer-based and on-the-job training.
- We did not find evidence that meter reading schedules are assigned in a manner that may compel meter readers to take short cuts to complete their assigned routes.
- APS uses DB Microware route management software to develop meter reading routes that have six to six and one-half hours per day of meter reading time. Designating this approximate amount of productive meter reading time within an eight-hour workday is consistent with the practices of other meter reading departments in the electric utility industry. These time periods allow for traveling between the meter shop and the route(s) and other contingencies. Each meter reader interviewed indicated that he or she had sufficient time to read assigned routes, that he or she did not have uncomfortable pressure to complete reading the routes, and that he or she could receive assistance from other resources if it was needed to complete reading a route on time.
- APS is currently pilot testing the use of remote reading technologies and should keep the Commission Staff informed about the status of the test and its future implementation plans.

3. Are meter reading personnel taking the appropriate action to obtain actual meter readings?

Yes, although APS should continue to improve its "no access" practices, it has made improvements in obtaining access to customers' premises.

- Estimated bills as a percent of total bills issued have declined slightly from approximately 1.4 percent in 1995 to under 1.2 percent in 2004, while peaking in 1998 and 1999 at approximately 2.0 percent. Electric industry benchmarking data reflect that the best performing electric utilities read 99.6 percent of all meters while average performance is 94.50 percent.[2]

[2] Based on the results of a benchmarking study sponsored by an independent consultant in which APS participated. Based on high-low failures, these percentages could be higher than the percent of bills estimated.

- APS enhanced its "no access" policies in 2003, which contributed to the favorable trend in recent years.
- The Company's established practice does not include scheduling meter readings at other than normal business hours or making appointments for meter readings.
- Information obtained in connection with the comparative analysis indicates that several other electric utilities use remote meter reading devices to obtain actual meter readings for premises with meter access problems.

Usage Estimation and Billing (Chapter IV)

1. Does the Billing Services Department have sufficient resources and controls to process billing exceptions and perform other required billing-related activities appropriately and on a timely basis?

Yes.

- APS has had approximately the same number of Billing Services Representatives (BSRs) over the past three years.
- The Billing Services Department's budgets and actual expenditures were not significantly reduced during the period 1995-2004.
- The APS Billing Services Department has improved the documentation of its processes and is beginning to track the productivity of BSRs.
- APS implemented a quality control function within its Billing Services Department during 2003.
- The timing of APS' improvements to its billing estimation processes appears to be reactive to the ongoing litigation activities, rather than proactive in nature.

2. Are usage estimation and billing practices consistent with Commission Rules and Regulations and specific tariff provisions?

No. APS uses a seasonal average to estimate kWh rather than the customer's usage during the same month of the previous year and the customer's usage during the preceding month as specified in R14-2-210(A)(2). In addition, APS uses a combination of customer-specific kWh and class-average load factor to estimate demand rather than the kW measured since the last resetting of the kW dial as specified on its residential demand rate schedules EC-1 and ECT-1R.

- Although both the old CIS and new CIS estimate demand using load factor, the underlying information used to calculate the load factor changed in March 1999.
- APS' estimating practices have changed over time, and it has not routinely notified the Commission in advance of each change.

3. Are customers harmed by the methodologies being used to estimate demand?

Yes, although the extent of the harm has not yet been quantified.

- While APS does not adjust estimated demand upward if the subsequent actual demand reading is higher than the estimate, it has not always adjusted the demand estimate downward if the subsequent actual demand reading is lower than the estimate.
- A naturally occurring phenomenon of rising demand in months approaching summer may reduce the possibility that overestimated demand will be discovered. For example, if a demand is overestimated in May, an actual read taken in June may be unlikely to reveal the earlier overestimation, because the June demand is likely to be higher than the May demand. Therefore, it becomes less likely that such an overestimated demand will be credited as a result of a subsequent demand comparison.
- While APS claims that its demand estimating practices implemented in March 1999, which included the use of class average load factors rather than customer specific load factors, would on average result in the underestimation of demand, the Company has not properly considered the impact of the change on individual customers and the public interest.

4. Was the new CIS implemented in a manner that did not adversely affect APS' ability to estimate bills effectively?

No, there were various problems associated with estimated bills following the implementation of the new CIS.

- We could not determine whether APS, prior to its implementation, recognized that its new CIS, which was initially developed by IBM for another electric utility, had different billing exceptions for consecutive monthly estimates than required to facilitate compliance with Commission rules.
- Both the old and new CIS were unable to consistently print bills that set forth the reasons for estimates.
- Since the implementation of the new CIS in September 1998, it has taken APS significant time and effort to align the new system with desired business practices.
- The functionality of the new CIS included estimating kWh based on a customer-specific six month seasonal average rather than using a customer's prior month or same month last year usage. APS chose to accept this functionality rather than use customer specific prior month or same month last year usage similar to the old CIS.

Comparative Analysis (Chapter V)

1. Are APS' usage estimation, meter reading, and billing practices consistent with those of other Arizona electric utilities?

No, APS' practices for estimating both kWh and kW vary from those practices in place at other electric utilities in the State of Arizona.

- APS estimates kWh using a six-month seasonal average kWh per day, and is the only electric utility in Arizona that uses a six-month seasonal average to estimate kWh.
- While APS estimates demand using customer-specific kWh and a class average load factor, Tucson Electric Power Company (TEP) manually estimates demand using this month's actual or estimated kWh and a customer-specific load factor calculated from the same month of the prior year.

2. Are Commission Rules and Regulations regarding usage estimation, meter reading, and billing practices consistent with those of other state utility regulatory agencies?

Yes, ACC rules related to estimated billing are generally consistent with practices in other jurisdictions.

- Commission rules and regulations in other states are generally silent on the issue of demand estimation practices.
- Information obtained in response to the Staff's November 26, 2004, letter to other state utility commissions indicates that Arizona rules related to meter reading and billing are generally consistent with rules in place in other states.

3. Are APS' usage estimation, meter reading and billing practices consistent with those of comparable electric utilities?

Yes, except that APS' use of seasonal averages to estimate kWh is not consistent with the other utilities surveyed. The consistency of APS' residential demand estimation procedures could not be confirmed because there is insufficient information available to identify a common industry practice.

- While the information available suggests that APS' usage estimation, meter reading, and billing practices are generally consistent with the practices of comparable electric utilities, several use remote meter reading devices to obtain actual meter readings for premises with meter access problems.
- BWG has identified four methods to estimate demand for residential and small commercial customers and further analysis is required to determine the best process. BWG will be providing the results of its analysis to the Commission at the time of filing testimony in this proceeding.

Avis Read (Chapter VI)

1. Are the allegations in the Avis Read Complaint supported by the facts of the case?

Yes, in part. Our review concludes that APS did not appropriately handle the Read matter from a customer service perspective; however, our analysis also found that Ms. Read's bills were underestimated rather than overestimated.

- Contrary to the allegations contained in the Read Complaint, the main problems with the estimated bills issued to Ms. Read, primarily at her residence in Paradise Valley, are that the estimates are too low rather than too high.

- During the period from September 1999 through January 2000, APS did not mail bills to a total of 663 customers, including Ms. Read, because of a CIS problem. Some customers did not receive bills for as many as six months although approximately one-half were for only one month. APS is required to issue monthly bills to its customers. As a result of this CIS problem, APS violated Commission rules and regulations.
- The two sets of bills rendered to Ms. Read for the period from December 17, 1999 through February 17, 2000 represent standard bill/re-bill practices for the adjustment of estimated bills, but the bill notices do not clearly communicate the purpose of the reissued bills.
- The problems associated with Ms. Read's two accounts as described above and the poor customer service provided by APS to Ms. Read are disturbing. APS should not have a) allowed Ms. Read to not have received bills for utility service for the period from September 1999 through January 2000, b) allowed the number of consecutive estimated bills to be rendered without making arrangements to obtain access to the meter, and c) continued to render bills based on underestimated consumption once the actual meter reading was obtained. In addition, APS should have been more responsive to Ms. Read's concerns over her high energy consumption and to the financial hardships created as a result of the bills not issued and the high true-up bill once the actual meter reading was obtained.
- While APS claims that its demand estimating practices implemented in March 1999, which include the use of class average load factors rather than customer specific load factors, would on average result in the underestimation of demand, the Company has not properly considered the impact of the change on individual customers and the public interest.
- From September 1998 through September 2003, APS did not have a systematic method for identifying all accounts where the estimated demand proved to be higher than the actual demand reading obtained.
- Paul and Linda Schaeffer received eleven estimated bills from the time they became customers of APS in April 2002 through February 2003 when they moved.

2. Does the review of the usage estimation, meter reading and billing activities associated with the 35 customers who lodged informal complaints support the allegations?

Yes, in part. The review of the account activity for these customers indicates that APS did not take sufficient action in response to the "no access" situations identified for these accounts. While APS's "no access" practices have improved over time, they are not sufficient to ensure that actual meter readings are obtained within a reasonable timeframe.

- The thirty-five (35) customers who have lodged informal complaints with the Commission received a total of 232 estimated bills covering the period from August 1995 through October 2004. While each of these estimated bills was identified as such, not all of them stated the reason for the estimate on the bill, although this practice has improved over time. It appears that the action taken by

APS was consistent with the Company's stated practices in response to the consecutive estimated bills, although records do not exist in all instances, and these practices have improved over time.

CHAPTER II

Background

Arizona Public Service Company (APS or the Company) provides electricity to over 900,000 customers in Arizona. APS is the largest subsidiary of the publicly traded Pinnacle West Capital Corporation. Ninety-five percent of APS' 2003 revenues was derived from regulated operations while five percent was derived from the sale of competitive energy including wholesale marketing and trading. Approximately eight percent of APS' 814,000 residential customers and 93 percent of APS' 101,000 non-residential customers are served through demand meters.

The Utilities Division Staff (Staff) of the Arizona Corporation Commission (ACC or Commission) retained the Barrington-Wellesley Group, Inc. (BWG) to perform an inquiry into the usage estimation, meter reading and billing practices of APS. A significant portion of this inquiry was devoted to reviewing the process of bill estimation of demand meters. The following events led to this inquiry.

Avis Read Class Action Claim

On June 4, 2002, a class action complaint was filed in the Superior Court of the State of Arizona by Avis Read against APS (Read Complaint). The complaint alleged that APS systematically failed to follow required practices and procedures regarding meter reading, estimation and billing and that APS harmed its customers by doing so.

On August 19, 2004, the Superior Court ruled that Avis Read's claims "fall within the ACC's areas of primary jurisdiction" and that the Commission should decide the matter. Thus, on September 9, 2004, Avis Read filed a formal complaint at the Commission regarding APS' "improper estimation and billing procedures on demand meters."

The allegations in the Complaint filed with the Commission in Docket No. E-01345A-04-0657 on September 9, 2004 include the following:

- APS estimates demand in ways that are inconsistent with Arizona law resulting in overcharges to customers.
- The estimating procedures used by APS, including procedures used to estimate demand, were developed, and subsequently changed, on an *ad hoc* basis and without approval by the Commission.
- APS procedures that allow for estimated bills to be rendered for more than three consecutive months violate Commission Rules and Regulations.
- One of Avis Read's meters (Meter No. A93326) was almost never read by APS, and no arrangements were made to read the meter. Another Avis Read meter (Meter No. 906893), which included a demand component, was also estimated for months at a time.
- Estimated bills rendered by APS were consistently higher than they would have been if they had been based on actual meter readings, and they were not always represented as estimated bills.

- Estimated demand cannot be trued-up when the actual demand reading is obtained and it is impossible to know when the highest demand has occurred; therefore the actual reading is just an estimate that becomes a final charge for electricity.

APS' Declaratory Order Application

On October 22, 2003 APS filed an application with the Commission requesting a declaratory order regarding bill estimation procedures. In its application, APS asks the Commission to find that its past and present procedures for bill estimation either are exempt from or comply with the requirements of A.A.C. R14-2-210 and A.A.C. R14-2-1612 and that all estimated bills rendered using such procedures are valid and enforceable. APS sought the declaratory order because of the litigation in Superior Court (Avis Read Complaint). APS stated the following in its request:

- Rule 210 and Rule 1612 do not apply to standard offer customers of APS.
- Neither Rule 210 nor Rule 1612 invalidated the bill estimation procedures used by APS.
- The Commission should re-affirm APS' bill estimation procedures.
- Rule 210 and Rule 1612 are invalid.

On February 25, 2004 Avis Read filed a motion to intervene in APS' request for a declaratory order. The motion was granted by the Commission.

On May 26, 2004 APS amended its application for a declaratory order. The amended application includes references to the Avis Read Complaint and an updated and more comprehensive description (revised on April 21, 2004) of APS' bill estimation methodologies. APS stated the following in its amended request:

- Rule 210 and Rule 1612 are invalid absent certification by the Attorney General.
- Even assuming rules 210 and 1612 are valid, these rules do not apply to APS' standard offer customers.
- Even assuming rules 210 and 1612 are valid, neither rule invalidated APS' historical bill estimation procedures.
- The Commission should re-affirm APS' current bill estimation procedures.
- APS' interpretations of what constitutes an "estimated bill" and of the requirements of Rule 210 are appropriate.

APS filed a second amended application for a declaratory order on August 6, 2004. This second amended application includes clarifying language and corrects erroneous statements contained in APS' bill estimation methodologies previously submitted to the Commission within APS' prior amended request on May 26, 2004.

CHAPTER III

Meter Reading

This chapter discusses our review of APS' meter reading practices, including practices designed to remedy "no access" conditions.

A. BACKGROUND

Currently, APS is required to read approximately 1,025,000 meters each month. The APS service territory includes the Metropolitan Phoenix area, which is predominantly urban and suburban. The northern and southern divisions include urban, suburban and rural areas.

The type of electric meter installed at a customer premises depends on the customer's rate schedule. APS rate schedules include standard rates that are based on the amount of usage; time advantage rates that vary based on the amount of energy used during on-peak hours or off-peak hours; and demand rates that are based on kWh and peak demand. About 40 percent of APS meters are standard watt-hour meters that measure kilowatt-hours. Meter readers obtain a reading from standard meters by reading the five dials on the front of the meter. They enter meter reading data in the Itron Hand Held Computer ("Itron HHC"). The other 60 percent of APS' meters are time of use or demand meters that measure not only the energy used in kilowatt-hours, but also record the time of day that energy was used and the demand[3] in kilowatts. Of these meters, a demand meter tracks the highest (or peak) kW demand that occurred during a sixty-minute period since the demand meter was last reset. The demand meter must be reset each month to record the new demand achieved. These meters may be read either manually by viewing the five entries in the digital liquid crystal display (LCD) or by probing the meter. To probe a meter, the meter reader must physically touch the meter to obtain the readings of demand and kWh. Finally, the meter reader must reset the demand by breaking a seal that was attached during the time that the meter was last reset. Once they have reset the demand, they re-attach a new seal.

APS has divided its customer accounts into twenty-one (21) billing cycles per month.[4] Meters are organized into meter reading routes that are required to be read each billing cycle by one of the 158 APS meter readers. APS plans meter routes based on a six-hour read time and an eight-hour workday.[5] The six-hour read time assumes that a meter reader will have sufficient time to complete the route during the work day, while allotting time for lunch, breaks, and travel time. The meter readers use the Itron HHC to enter data, and a probe is used for the meters that are probeable.

---

[3] The 2004 Meter Reader Manual defines demand as the amount of power a customer demands that APS supply to run the customer's electrical equipment at any one time.

[4] Based on information provided in response to Staff (DR) 1-25 and APS06440, 2004 Revenue Accounting Schedule.

[5] Based on information provided in response to Staff DR 1-29 and 1-30.

In September 1995, APS issued a no-access policy. A procedure titled "No Access Prevention and Resolution Process" was revised on July 24, 2003.[6] This procedure requires the meter reader to leave door hangers and indicate a reason for "no access." The door hanger includes the call center phone number. In the Itron HHC, the meter reader codes the account as a code 40, "left door hanger."[7] In 2003, the monthly steps (for months 1 through 6) taken by the meter reading administrative coordinator, head meter reader, or business office representative included:

Month 1. Review CIS usage history detail to confirm meter reader left door hanger and coded account "40".

Month 2. Review CIS usage history detail to confirm meter reader left door hanger and coded account "40". If not, the person working the "no access" report notifies the team leader for follow-up with the meter reader. Identify large non-residential accounts for action by Key Account representative.

Month 3. Review CIS usage history detail to confirm meter reader left door hanger and coded account "40". Accounts that have three consecutive months will download to the auto-dialer to leave a recorded "no access" message. The auto-dialer updates the account with this information.

Month 4. Mail a "No Access" postcard to the accounts with four consecutive months of "no access". This postcard instructs customers to contact the Call Center for solutions to avoid future interruption of service. The post card notifies TOU customers that their rate schedule will be changed to 0100. Review CIS usage history detail to confirm meter reader left door hanger and coded account "40".

Month 5. Accounts with five consecutive months of "no access" receive a letter notifying them about service interruption and instructing them to contact the Call Center. Research account thoroughly to check for customer communications. Generate service disconnect notice.

Month 6. (Customer has received five door hangers, auto-dialer call, postcard, and service interruption notice). Research account thoroughly to check for customer communications. Contact customer by phone; if unable to reach customer by phone, generate disconnect order. Note account "disconnect order for six consecutive months no access"; indicate reasons for "no access".

The current revision of the APS "No Access" Policy includes the revision date of March 16, 2004. APS stated that a variation of this "no access" policy has been in place since the mid-1990s.[8] Some of the changes included in this revision were:

---

[6] APS0363

[7] APS03371

[8] Based on information provided in response and supplemental response to Staff DR 1-13, APS06464.

- On the first and subsequent months of "no access", the meter reading administrative coordinator will create a meter access request letter to send to the customer if the meter reader did not leave a door hanger.
- On the second and subsequent months of "no access" to a non-residential customer, the administrative coordinator will notify the key account representative for action.
- The policy specifies the names of the postcards or letters that are used to communicate with the customer at various steps.

B. WORK TASKS

As part of our review of APS' meter reading practices, BWG interviewed six meter readers and three meter reading section leaders as well as several customer service management personnel. We reviewed trends in meter reading expenditures, staffing levels, and the number of meters that could not be read by reason. We also reviewed controls in place to assure that all meters are read and that readings are accurate.

C. FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

C.1. EVALUATIVE CRITERIA: ARE METER READING RESOURCES SUFFICIENT TO ENSURE THAT METER READINGS ARE COMPLETED ON A TIMELY BASIS?

1. APS has not had significant cutbacks in meter reading-related expenditures that might have contributed to increased levels of estimated bills.

    - APS meter reading expenses for 1995 through 2003 are provided in **Table III-1** and reflect that meter reading expenses have increased each year over the period.
    - When considered as a unit cost per customer, as shown in **Table III-2**, meter reading expenses have increased each year except for 2002 when they decreased by 1.5 percent over 2001. In comparing the Metro Phoenix budgets of 1999 and 1998, the primary reason for the increase during 1999 was overtime and premium pay. Overtime pay in 1999 increased by 24 percent over 1998, while premium pay increased by 35 percent[9]. APS implemented DB Microware, a software program for meter reading route management, during 2000. APS indicated that the introduction of this program allowed APS to improve productivity.[10] In 2001, the overtime pay budget for Metro Phoenix decreased by 14% over 2000, and premium pay was reduced by 6 percent.

[9] Based on information provided in the response and supplemental response to Staff DR 6-2, APS06545. APS did not provide similar budget detail for the state regions because they did not have similar reports as Metro Phoenix.

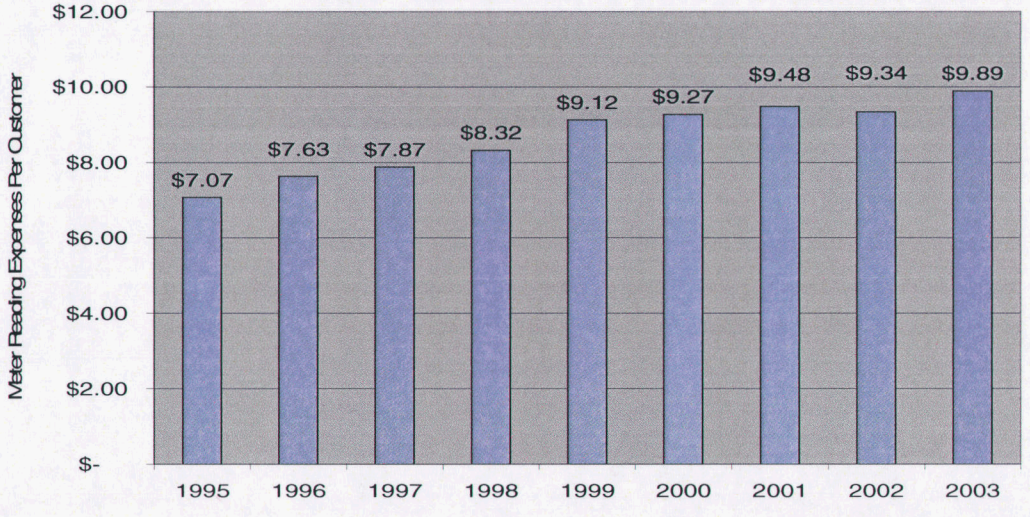
[10] See response to Staff 1-28.

Table III-1
Meter Reading Expenses, FERC Account 902
1995 - 2003

Year	Meter Reading Expenses FERC Account 902	No. of Customers	Meter Reading Costs per Customer	Percent Increase over Prior Year
1995	$4,869,783	689,132	$7.07	
1996	$5,476,235	717,614	$7.63	8.0%
1997	$5,891,416	748,070	$7.87	3.2%
1998	$6,472,757	777,613	$8.32	5.7%
1999	$7,356,029	806,659	$9.12	9.6%
2000	$7,760,367	837,063	$9.27	1.7%
2001	$8,289,315	874,537	$9.48	2.2%
2002	$8,423,848	902,029	$9.34	-1.5%
2003	$9,213,438	931,459	$9.89	5.9%

Data Source: Response to Staff DR 6-8, FERC Form 1

Table III-2
Meter Reading Expenses per Customer
1995 – 2003



Source: Response to Staff DR 6-8, FERC Form 1 Reports for 1995-2003

2. Over the period from 1995 to 2004, meter reader headcount increased by almost 30 percent, from 111 to 158.

   - However, only a portion of the increase in the number of meter readers from 2003 to 2004, as shown in Table III-3, represents additional meter reading resources. While meter reading resources have increased to meet customer growth needs, meter readers have now been trained to perform, and are performing, work such as meter reconnects and disconnects, that was previously completed by service department personnel.

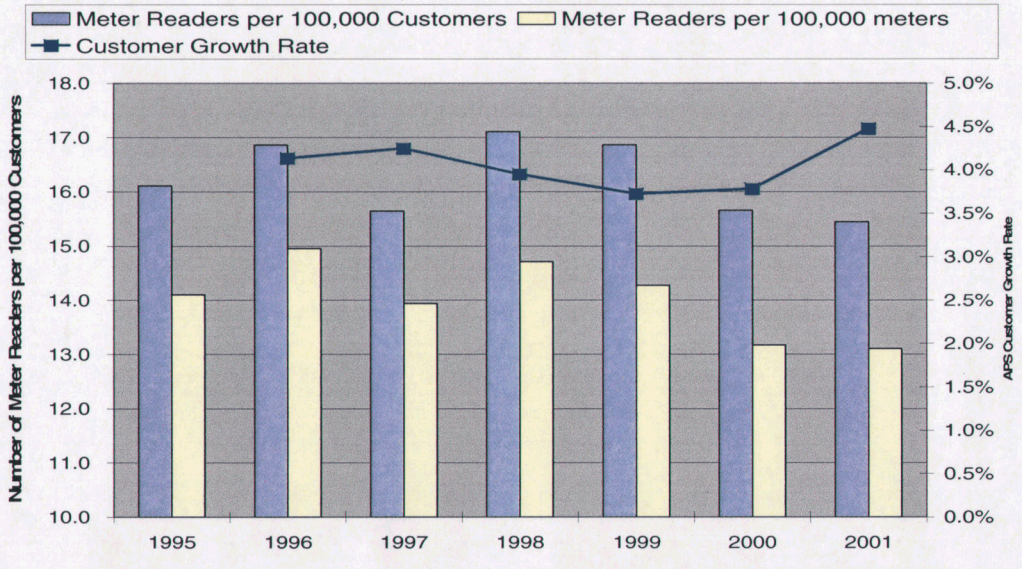
Table III-3
Headcount of APS Meter Readers
1995-2004

Year	Headcount of APS Meter Readers
1995	111
1996	121
1997	117
1998	133
1999	136
2000	131
2001	135
2002	139
2003	145
2004	158

Source: Response to Staff DR 6-5

- **Table III-4** compares changes in meter reading staffing levels to the APS customer growth rate. In 2000 and 2001, APS meter reading staff declined on a per customer basis compared to both historical staffing levels and customer growth, but recovered in 2003 and 2004. Part of the increase in staffing levels in 2004 was due to changing job responsibilities that shifted certain activities from the service department to the meter reading department as mentioned above.

Table III-4
Meter Reader Headcount vs. APS Customer Growth Rate
1995 – 2001

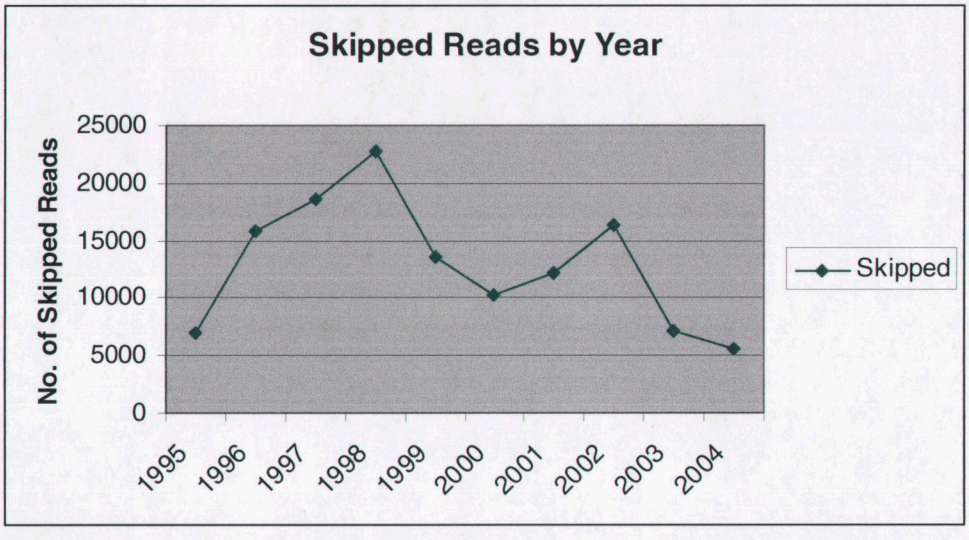


Source: Response to Staff DR 6-5 and Staff DR 6-8, FERC Form 1 Reports for 1995-2001

3. While management represents that all meters are read monthly except for those that cannot be read due to access problems or safety concerns (including bad weather), meter reads are not obtained on occasion due to the unavailability of meter reading resources (i.e., "skipped").

   - As shown on **Table III-5**, during the period from 1995 through 2004, APS has "skipped" meter readings each year. The highest number of "skipped" meter readings was 22,669 in 1998, or approximately 0.2 percent of meter readings.
   - In 2003/2004, this rate has dropped to approximately 0.06 percent of meter readings.

Table III-5
"Skipped Reads" per Year
1995 – 2004



Source: Response to Staff DR 6-11, BWG Analysis

4. The lack of sufficient meter reading resources to ensure that meter readings are never "skipped" does not appear to be due to planned cut-backs in the number of full-time meter readers. "Skipped" meter readings occur because back-up meter reading resources are not always available, despite the existence of the supplemental hiring hall resources (which are not designed for immediate short term needs). While the number of "skipped" reads can likely be reduced, based on our experience, the number of "skipped" reads does not appear unreasonable compared to industry practices.

   - APS and the International Brotherhood of Electrical Workers (IBEW), the union representing APS bargaining unit employees, have developed agreements by which supplemental meter reading resources can be provided to handle changes in meter reading workload. The supplemental resources can be brought into APS via the IBEW hiring hall after administrative processing that includes pre-employment screening such as drug testing.

- APS states that it has used supplemental meter readers to cover periods of absences caused by situations such as illness, short-term disability, or turnover caused by progression of employees to other positions at APS.
- However, during the period of March through July 2002, the Douglas and Bisbee areas periodically notified APS's Consumer Advocate's Office that those areas would have some estimated (i.e., "skipped") reads due to injury or other availability issues concerning meter reader(s). According to the APS Manager, Regulatory Affairs, the APS Consumer Advocate's Office had requested each meter shop to notify it in the event that the meter shop had "skipped" reads. Over this time period, the Bisbee office experienced seven instances where meters were not read, and reported that it had "skipped" a total of 1150 reads. The Douglas office "skipped" a total of estimated 858 reads because of eight instances where they were not able to read meters. The reasons for not reading the meter were not included in each correspondence, but they appear to be related to staffing or resource management issues including injury, family emergency, supplemental meter reader unable to finish route, or meter reader not able to report to work.[11]
- Interviews with meter readers, meter reading supervisors, managers, an administrative coordinator and the union leadership indicate that APS presently uses overtime and resource sharing among meter shops to address similar situations, when possible.

5. While BWG is not aware of any comprehensive meter reading benchmarking studies, APS has participated in some benchmarking or productivity studies performed by various consultants that compared the performance of the meter reading processes among several utilities.
   - During 1997, 2001, and 2004, APS participated in benchmarking studies to evaluate the meter reading process. These studies provided comparisons among other utilities in metrics such as unit cost, workload, productivity, accuracy, and others. Generally, the results of these studies indicated that APS had high service levels, high workloads, and a higher unit cost than the other participating utilities.
   - The standard number of meters read monthly per full-time equivalent (FTE) in the electric utility industry varies depending on geography, population density, types of meters installed, accessibility of meters, and other demographics. Meter reading productivity statistics are not standardized in the industry. Along with APS, Nashville Electric Service participated in the benchmarking study reported by Ascent Energy, Inc. during June 2004. According to a news release dated August 24, 2004, Nashville Electric Service reported that the average number of meters read per month per employee for the participating utilities was 6,382. The highest performing company in the study read 12,182 meters per employee per month.[12] Assuming that APS reads each of its approximately 1,025,000 meters

[11] Based on information provided in APS01651-APS01677, e-mail correspondence.

[12] Downloaded from http://www.newpower.com/p040824a.html on December 19, 2004. The complete benchmarking study is proprietary and not available for inclusion in this study.

each month, the annual average number of meters read each month per APS meter reader is about 6,487 meters.

- While one report indicated that workloads could be reduced for companies that read meters less often than every month, it indicated that such an approach might increase collection problems and cash flow delays. Although the report indicated that intentional estimation is a practice of some utilities, the report did not recommend the practice. APS claims that it does not consider intentional estimation an option.

Recommendation:

III-1. APS should be required to provide evidence to the Commission that new procedures have been put in place to ensure that staffing resources are sufficient to address emergency short-term needs for meter reading shops that are either smaller or remote. A report describing the new procedures and how they reduce the potential for "skipped" meter readings due to staffing resource issues should be provided to the Commission within six months of a decision in this matter. [Refers to Findings III-3 and III-4.]

C.2. EVALUATIVE CRITERIA: ARE ADEQUATE CONTROLS IN PLACE TO ENSURE THAT METER READING ROUTES ARE BEING READ ON A TIMELY BASIS?

6. While APS generally has well-documented processes and procedures for meter reading, and while it tracks meter reader performance, its "no access" and compliance reporting procedures are inadequate. In addition, performance tracking processes are not consistent among all operating divisions.

    - Metro Phoenix tracks performance measures based on individual meter reader statistics, shop totals and region totals. This area tracks numbers of meters read, number of errors, number of "no access" meters, average read time, average route time, and daily average meters read per meter reader. Generally, the divisions outside of the Metro Phoenix area track similar meter reading statistics but they report them on an individual meter reader level, without consolidating reporting by shop or division[13].
    - The administrative coordinators do not have a "no access" report that ages the "no access" accounts. If this report were available, it would simplify the identification of recurring "no access" problems at the same premises, allow the prioritization of accounts to focus first on demand-billed customers, and simplify the effort spent tracking these accounts by the Administrative Coordinator.
    - The annual meter reading schedule and the revenue accounting schedule indicate that the meter readings are scheduled to coordinate with the 21 billing cycles each month. APS does not perform what is referred to as "same-day

[13] Based on response to Staff DR, APS06618

billing". The APS 2004 Revenue Accounting Schedule plans seven or eight days between the date that a route is scheduled for meter reading and the date that the billing cycle is scheduled for billing.[14]

- APS was unable to provide management reports that demonstrated whether it tracks compliance with the Commission requirement to read meters no sooner than 25 days after the last meter reading and no later than 35 days after the last meter reading[15]. An example of a management report would include a performance measure such as percent of routes completed within the 25/35 day window or the percent of meters read within the 25/35 day window. Two other examples include the percent of meters read by the scheduled billing date and the percent of meter reading routes completed by the billing date.
- If actual reads are missed by meter readers, APS meter reading supervisors are alerted by several control reports that are reviewed daily by either the shop administrative coordinators, meter reading supervisors in small shops, or by administrative coordinators in the local offices, for example in the Yuma area. These reports track accounts with "no access," abnormal reads, route irregularities, and meters for which demands were not reset. In January 2001, the meter reading team leaders committed to review these reports more consistently.
- Designated individuals, such as an administrative coordinator in either the meter shop or a local office or the meter reading supervisor, are assigned to work the "no access" process by each meter shop. The "no access" reads report is issued daily to identify the reads that were identified as "locked out" by a meter reader. Based on an examination of data responses and interviews with route coordinators, meter reading team leaders, and an administrative coordinator, APS appears to be working the "no access" process more aggressively since January 2001.

7. APS' meter reading control processes include:
    - Written expectations for meter readers;
    - Meter Reading Manual, Computer Pro® computer-based training, and on-the-job training;
    - No tolerance policy for falsifying reads;[16]
    - Matrix of meter reader's performance targets - error rate targets or expectations for the meter reader classifications (such as first six months, second six months, third six months, and thereafter) that become progressively more difficult as the meter reader gains experience in reading meters;

[14] Based on response to Staff DR 1-25, APS06440, 2004 Revenue Accounting Schedule.

[15] Within this report, this period of time may be referred to as the "25/35 day window".

[16] Based in response to Staff DR 9-1

- Daily reports, such as the "abnormal read", "no access", "demand meters to be reset", and "three months same demand" reports;
- DB Microware tools for route management, including re-routing, route characteristics, time to read route, and time elapsed between reading meters;
- Monthly or semi-annual performance measures of productivity and accuracy;
- Restricted access to last month's read and last month's usage on the Itron HHCs in Metro Phoenix meter shops, which increases the difficulty of curbing meter readings; and
- Quarterly or semi-annual switching of routes among meter readers.

8. APS prescreens meter readers before hiring and provides them both computer-based and on-the-job training.
   - The hiring process includes a process to prescreen candidates to determine if they have the attributes to be successful meter readers.
   - Meter readers undergo several days of computer-based training followed by meter reading in the field where they perform under the direction of an experienced meter reader.
   - When meter readers are ready to perform on their own, the supervisor generally assigns them shorter routes until they progress in their experience and capability.
9. APS was unable to provide sufficient information to enable BWG to analyze or trend the completeness or timeliness of meter reading for the period of 1995 to 2004.
   - APS could not provide a complete set of meter reading statistics for each meter shop for the same time period. For example, the Metro Phoenix meter shop provided consolidated reporting of its meter shops for 2002-2004, but was missing records for two shops during six months of 2002. No records were provided for Metro Phoenix for 1996-2001. The Southeast and Southwest areas tracked meter reading performance by individual meter reader by month. These offices had records for several years, but did not consolidate statistics by meter shop. The Southeast area provided a consolidated report by meter shop for 2004, but not for prior years. The Northern areas provided individual meter reading statistics for six months of 2004.
   - When advised that its response to Staff discovery regarding performance measures or performance metrics for meter reading was non-responsive, APS indicated that the information that it had previously submitted was the extent of documentation available.
   - In response to a request that APS provide the management reports that the Vice President, Customer Service receives regarding meter reading, APS only provided a summary of the Metro Phoenix area meters read. The summary did not include the reports of the remaining divisions.
10. We did not find evidence that meter reading schedules are assigned in a manner that may compel meter readers to take short cuts to complete their assigned routes.

- Using the DB Microware route management software, APS normally plans its meter reading routes to require between six to six and one-half hours per day of meter reading time. Designating this approximate amount of productive meter reading time within an eight-hour workday is consistent with the practices of other meter reading departments in the electric utility industry. Such a schedule allows time for traveling between the meter shop and the route(s) and other contingencies. Each meter reader interviewed indicated that he or she had sufficient time to read assigned routes, that he or she did not have uncomfortable pressure to complete reading the routes, and that he or she could receive assistance from other resources if it was needed to complete reading a route on time.
- Meter reading supervisors do not receive additional pay or incentive pay for achieving specific productivity or accuracy targets in meter reading. Generally, they are measured on the same overall company targets as other management employees and do not have additional monetary incentive to achieve productivity objectives at the expense of obtaining actual and accurate meter readings.
- While not every meter reader interviewed was familiar with the expression "curbing the meter[17]," all voiced the belief that falsifying reads was not tolerated by APS policies and that they could be terminated if they falsified reads. These comments are consistent with APS management's representations of a "zero tolerance" policy.[18]
- Meter readers were generally familiar with the Itron HHC features and provided the perspective that it was harder to falsify and conceal a false read than to read the route as APS expected. In the areas outside of Metro Phoenix, the prior month's meter reading and customer usage are displayed on one of the Itron HHC screens that the meter reader may access. It could be possible for a meter reader to use this information to record a false read. The controls in place that would detect this behavior include the "abnormal read" report, the "demand meter not reset" report, and other monitoring reports that provide the time elapsed to read the route and the time elapsed between reads. Additional verification would be necessary to completely rule out whether falsification was occurring. This would include sampling the Itron HHC devices and the management reports to detect abnormalities in route completions and elapsed reading times.
- At some point during the past two years, the manager responsible for the Metro Phoenix meter reading shops evaluated whether the prior month's meter reading and the prior month's customer usage should be provided on the Itron HHC screens or whether such data should be "turned off." The manager indicated that she made the decision to "turn off" this feature in the Itron HHCs for the

[17] "Curbing the meter" refers to intentionally falsifying a meter read.

[18] Based on response to Staff DR-9-1.

Metro Phoenix area. Disabling this feature makes it more difficult for meter readers to curb meter readings.

- For the period of January 1995 through October 2004, APS reported that it has terminated one employee for "estimating/curbing" the meter. That particular employee was terminated on May 18, 1995 for "estimating/curbing" meter reads. The employee worked out of the APS meter shop located at 501 South Second Avenue. The termination was later upheld through the IBEW arbitration process.[19]
- On November 18, 2004, an APS meter reader who was assigned to the Flagstaff office turned herself in for providing questionable meter reads. APS terminated this employee during November 2004.

11. APS is currently pilot testing remote meter reading technologies and should keep the Commission Staff informed about the status of the test and its future implementation plans.
    - According to the APS Vice President of Customer Services, the results of the pilots have proven to be successful to date.
    - The VP also indicated that, if the pilot test results are successful, APS will likely begin using this technology and replace existing meters in locations where access is routinely difficult to obtain.
    - If the use of this new technology is considered to be cost justified, it can most likely be implemented in the early years within current capital budget constraints.
    - Remote meter reading technology is commonly referred to as automated meter reading (AMR) in the utility industry. AMR is used by some utilities as a means to address "no access" problems. This is discussed in more detail in Chapter VI, Comparative Practices.

Recommendations:

III-2. APS should be required to revise the "No Access Meters" report, KM06R20, to provide the following additional features:
    - Report the present number of consecutive months that the meter reading department could not access the meter so that the Administrative Coordinator can track the steps required for each month of access problems and prioritize the APS response.
    - Report the other instances that the meter reading department was unable to read the meter during the previous twenty-four months to simplify identification of recurring "no access" problems at the same premises.
    - Prioritize accounts to focus first on demand-billed customers when working the "no access" report. APS should compile and maintain these reports for purposes of the independent audit. [Refers to Finding III-9.]

[19] Based on response to Staff DR 9-1.

III-3. APS should develop and install a performance measure to monitor the extent to which APS is complying with the Commission requirement to read meters each month (no sooner than twenty-five days after the last meter reading and no later than thirty-five days after the last meter reading). APS should provide to the Commission a description of its performance measure and the results of its analysis within six months of a decision in this matter. [Refers to Finding III-9.]

III-4. APS should change the options settings in the Itron software in all locations so that the Itron HHC used by meter readers in each of the APS meter read shops no longer includes the last month's usage and last month's meter reading. This feature should be disabled throughout APS' service territory within 30 days of a decision in this matter. [Refers to Finding III-10.]

III-5. APS should provide the Commission with quarterly reports related to the status of the remote meter reading pilot and implementation plans. The reports should provide a description of the meter reading technology being implemented, APS' plan for implementation, the number and type of customers involved in the pilot program, the costs associated with its implementation, and the operational efficiencies associated with its implementation. [Refers to Finding III-11.]

C.3. EVALUATIVE CRITERIA: ARE METER READING PERSONNEL TAKING THE APPROPRIATE ACTION TO OBTAIN ACTUAL METER READINGS?

12. Estimated bills as a percent of total bills issued have declined slightly from approximately 1.4 percent in 1995 to under 1.2 percent in 2004, while peaking in 1998 and 1999 at approximately 2.0 percent. Electric industry benchmarking data reflects that the best performing electric utilities read 99.6 percent of all meters while average performance is 94.50 percent.[20] Based on high-low failures, these percentages could be higher than the percent of bills estimated.

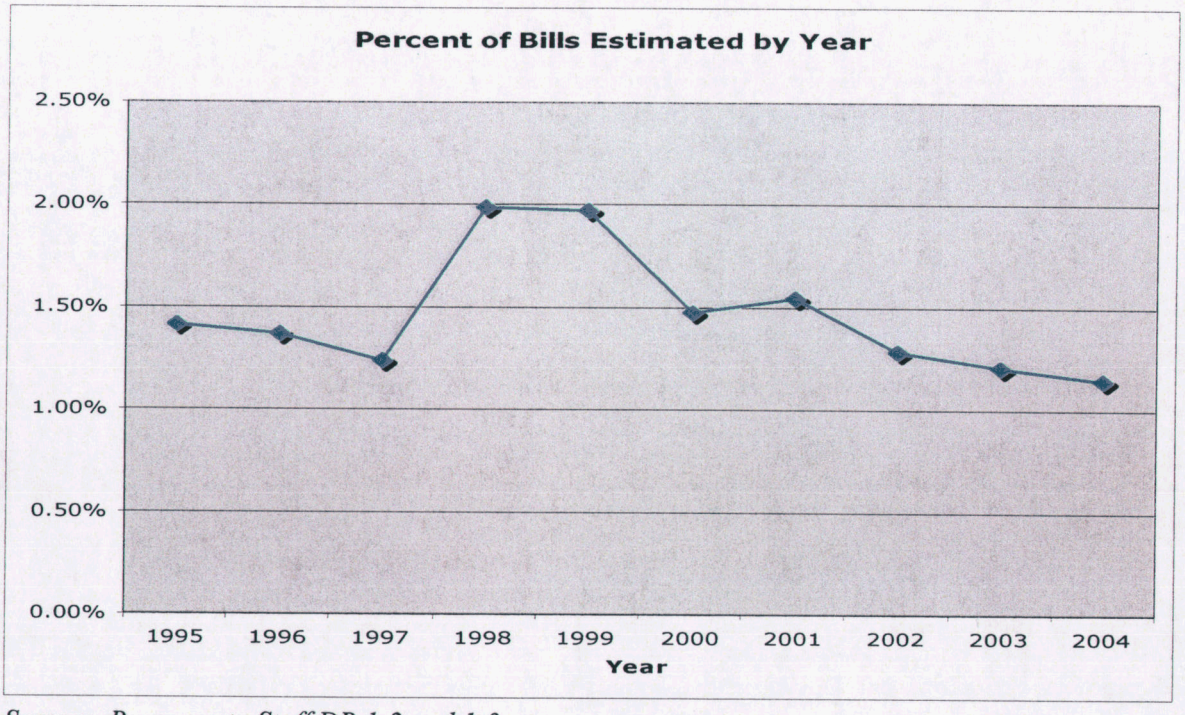
    - The number of meters which were not read peaked in the period following the implementation of the new CIS and coincidental with the time period (1998 – 2000) which is the focus of the Read Complaint.
    - APS enhanced its "no access" policies in 2003, which contributed to the favorable trend in recent years as shown in **Table III-6 and Table III-7**. Company meter readers now leave door hangers when unable to gain access to the meter location. **Tables III-8 through III-13** show trends in the percent and number of estimated bills by year by category for the two demand-billed residential rate schedules (EC-1 and ECT-1R) and the general service (E-32) demand rate schedule. **Table III-14 and Table III-15** present trends in the percent and number of estimated bills by category for rate schedule E-12, the rate schedule that represents the majority of APS's residential customers.

[20] Based on the results of a benchmarking study sponsored by an independent consultant in which APS participated.

- APS uses an auto-dialer to let customers know that arrangements need to be made to allow Company meter readers access to their premises. However, the auto-dialer is not used during the time period immediately preceding the scheduled meter read to remind customers that access needs to be provided.
- It may be possible that meter reading supervisory personnel do not routinely visit "no access" sites to ensure that all appropriate action is being taken to obtain access. After visiting the former Read residence in Paradise Valley, we believe that, if a supervisor had made a field visit to view the meter location, he or she would have been likely to develop a satisfactory solution to the problem.
- APS "no access" reads have decreased in the Metro Phoenix area since 2003. For the Metro Phoenix area, the "no access" percentage for 2000-2003 averaged 1.2 percent. The percentage dropped below one percent in November 2003, and the year to date average for 2004 is 0.9 percent.
- While completing the comparative analysis of practices in place in other jurisdictions, BWG identified one instance in which the measures required to be taken to obtain an actual meter reading include scheduling of a meter reading at other than normal business hours, making an appointment for meter reading or providing a prepaid postal card for a customer to submit an actual meter reading.
- BWG is in the process of obtaining information about the frequency of estimated bills for other Arizona electric utilities. We will provide the results of this analysis in subsequent testimony.
- Two of the companies that provided information in connection with BWG's telephone survey of comparable electric utilities also provided information related to their percentage of bills rendered based on actual meter readings. The percentages reported were 99.5 percent and 99.95 percent.[21]

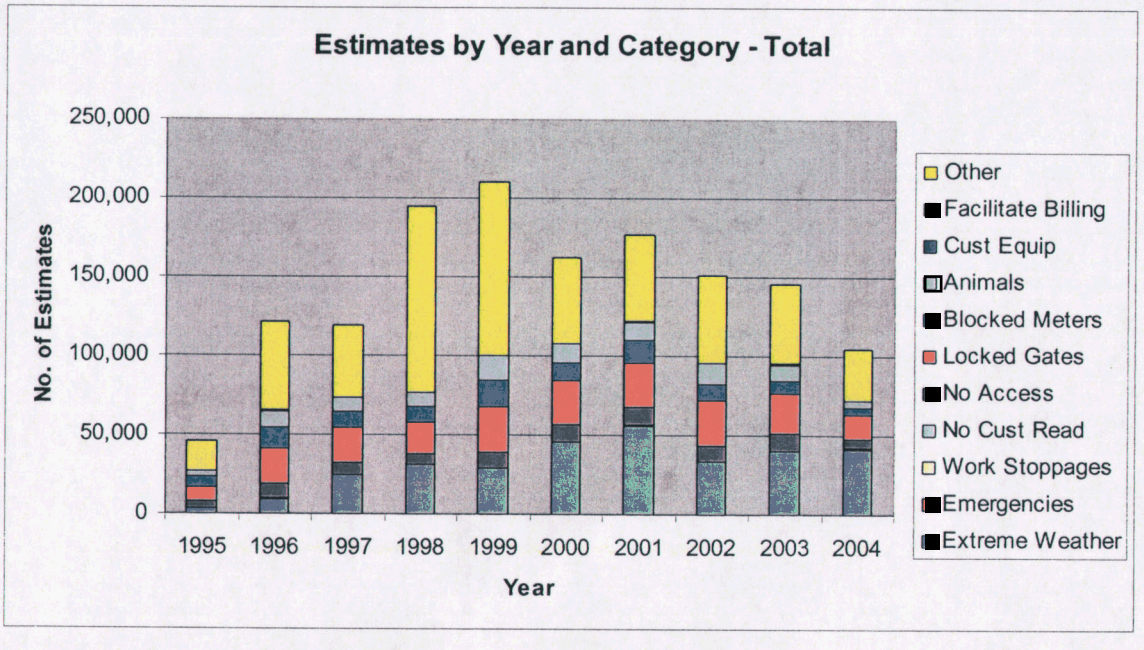
[21] Due to the nature of the telephone surveys completed, BWG did not obtain underlying data to confirm these responses.

Table III-6
Percent of Estimated Bills by Year
1995-2004



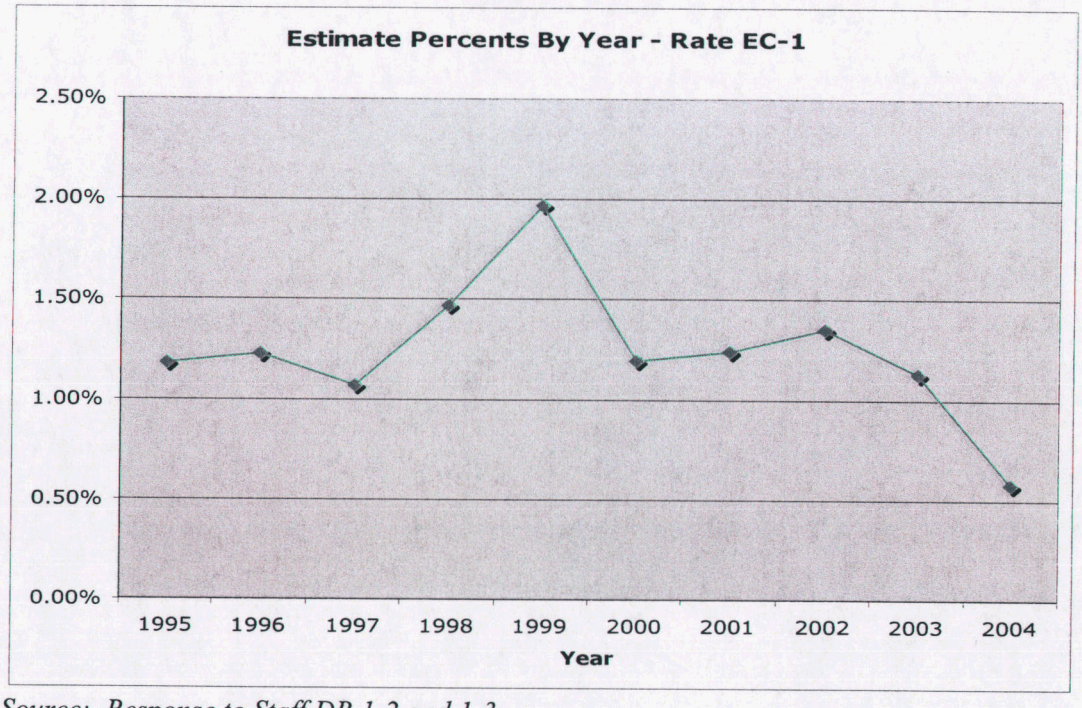
Source: Response to Staff DR 1-2 and 1-3

Table III-7
Estimated Bills by Year and Category - Total
1995 - 2004



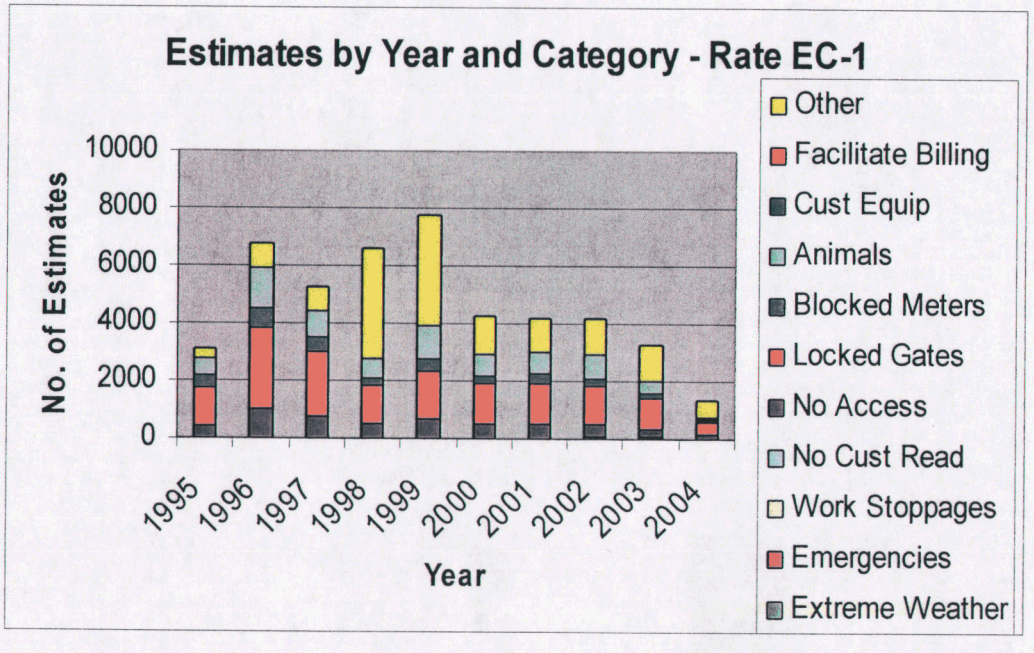
Source: Response to Staff DR 1-2.

Table III-8
Percent of Estimated Bills by Year – Rate EC-1
1995-2004



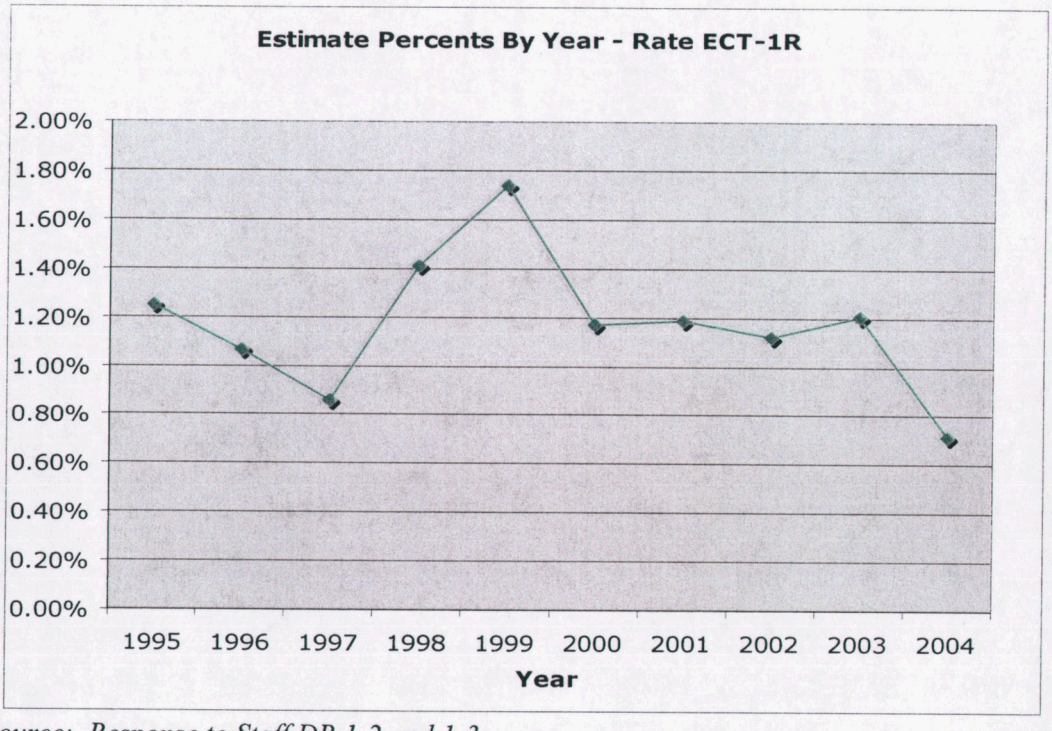
Source: Response to Staff DR 1-2 and 1-3

Table III-9
Estimated Bills by Year and Category – EC-1
1995 - 2004



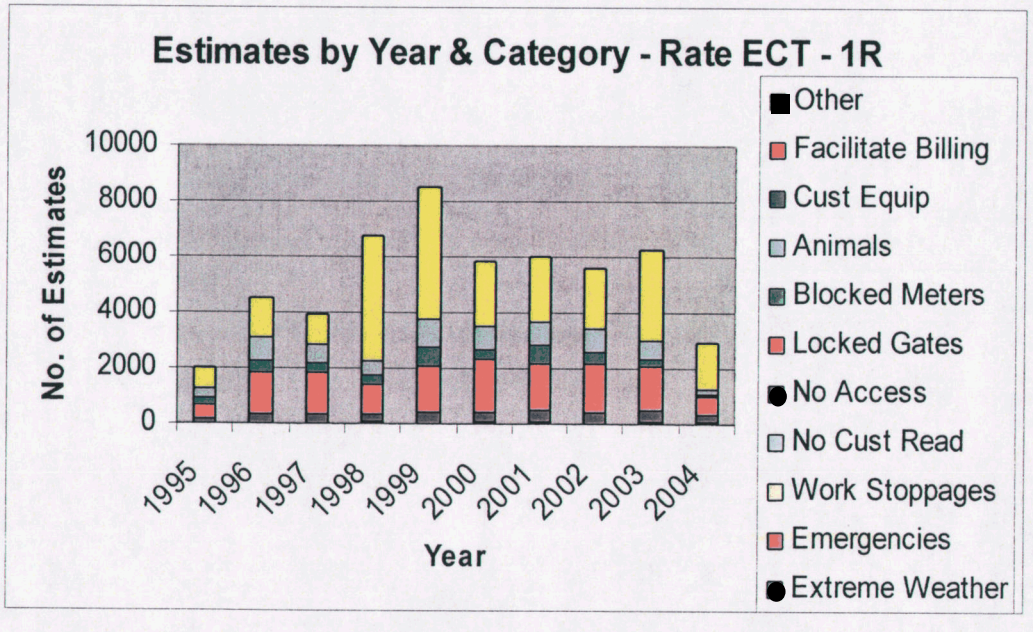
Source: Response to Staff DR 1-2.

Table III-10
Percent of Estimated Bills by Year – Rate ECT-1R
1995-2004



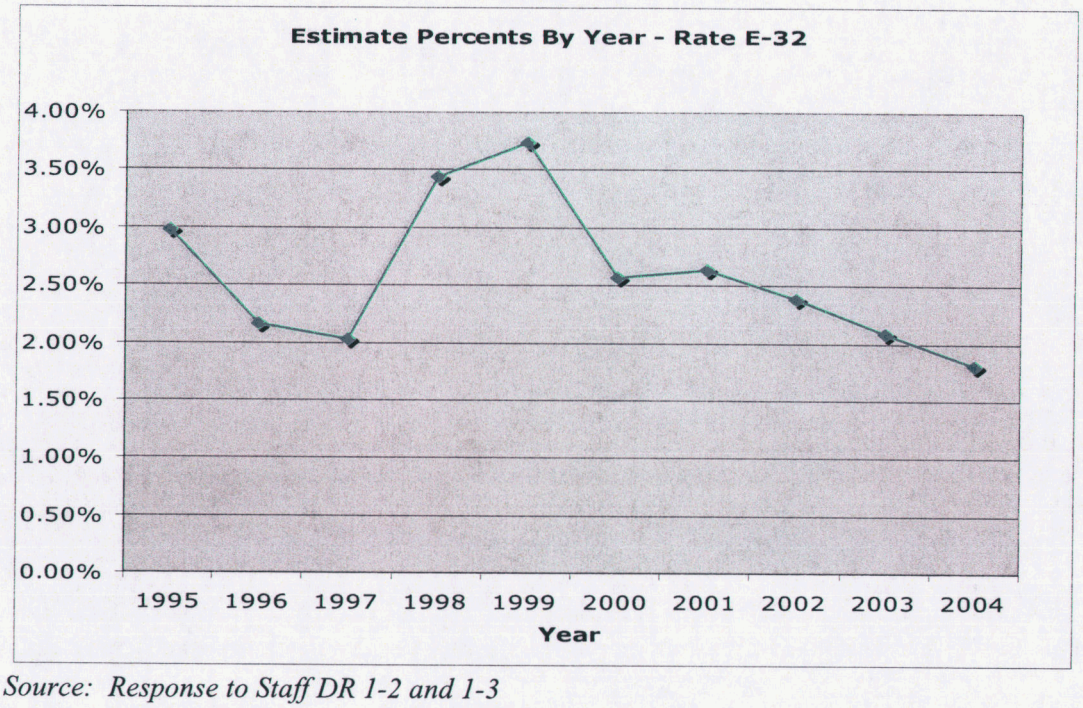
Source: Response to Staff DR 1-2 and 1-3

Table III-11
Estimated Bills by Year and Category – ECT – 1R
1995 - 2004



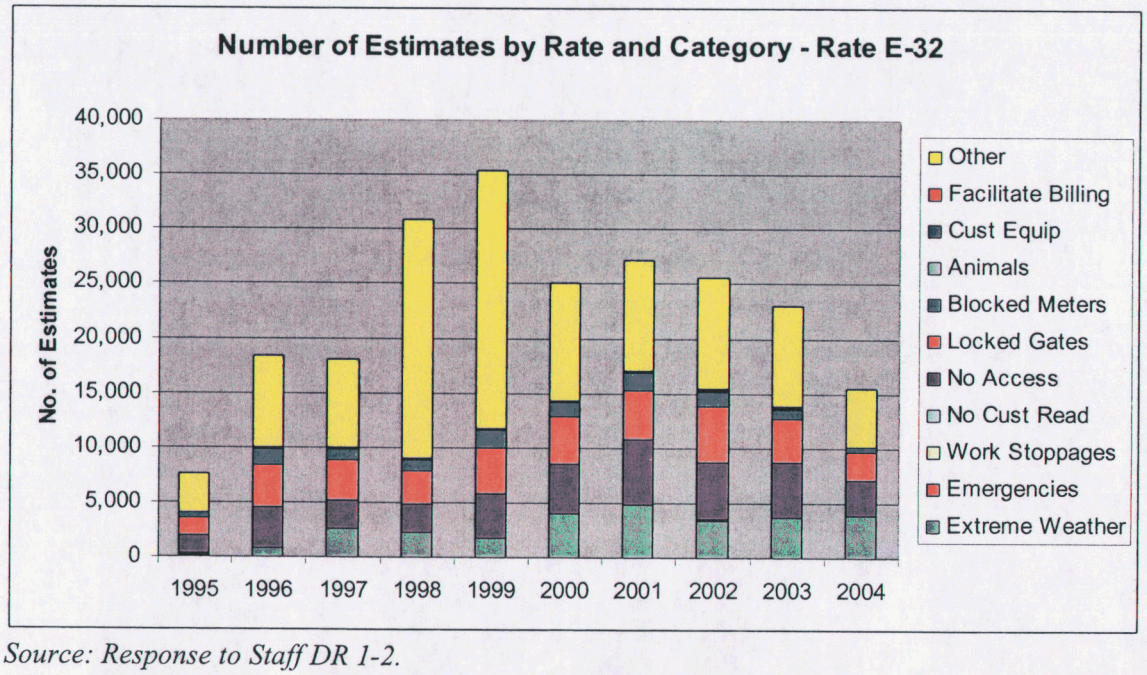
Source: Response to Staff DR 1-2.

Table III-12
Percent of Estimated Bills by Year – Rate E-32
1995-2004



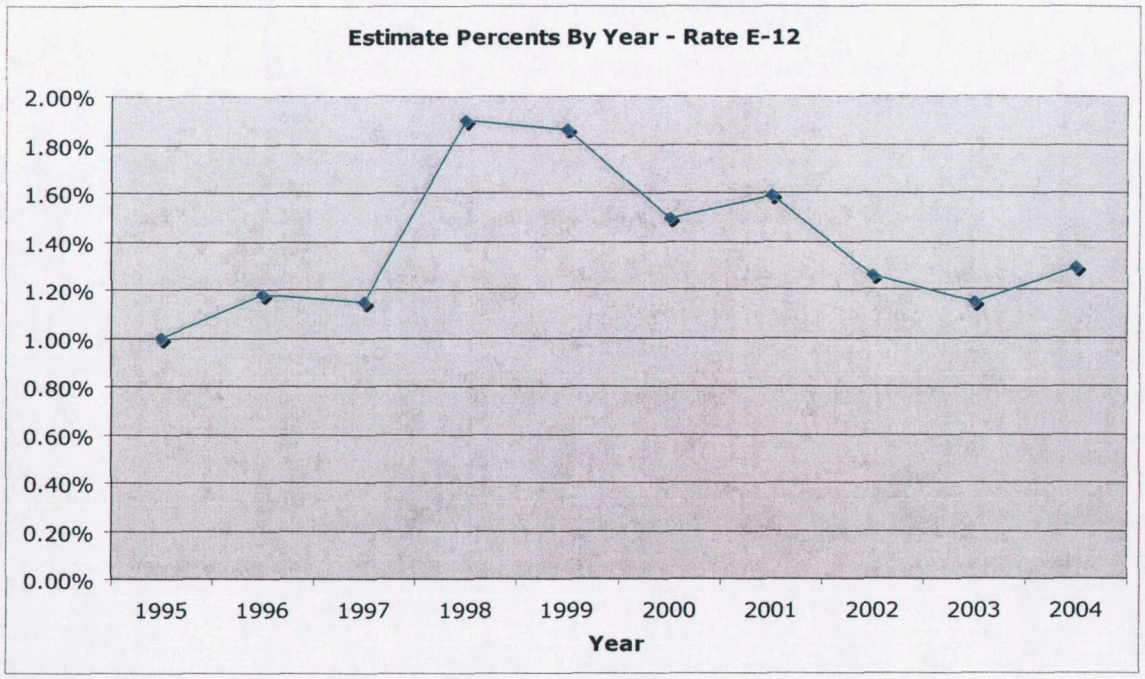
Source: Response to Staff DR 1-2 and 1-3

Table III-13
Estimated Bills by Year and Category – E-32
1995 – 2004



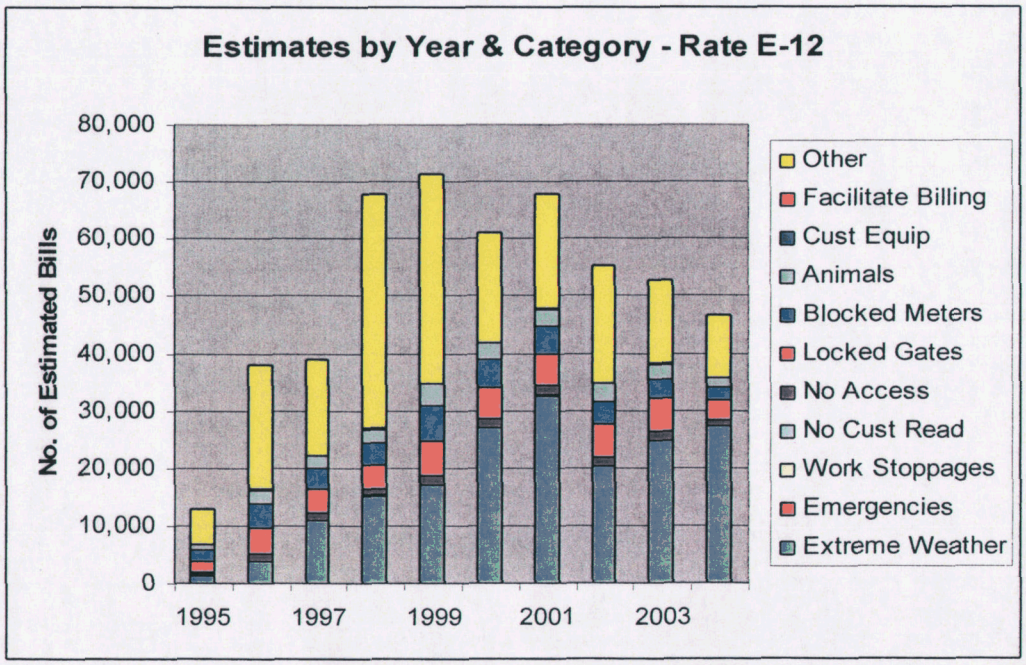
Source: Response to Staff DR 1-2.

Table III-14
Percent of Estimated Bills by Year – Rate E-12
1995-2004



Source: Response to Staff DR 1-2 and 1-3

Table III-15
Estimated Bills by Year and Category – E-12
1995 – 2004



Source: Response to Staff DR 1-2.

Recommendations:

III-6. APS should implement a pilot program to evaluate whether using an auto-dialer to communicate with "no access" account customers prior to the scheduled read date, in addition to the other methods presently used, will facilitate resolution of "no access" accounts. The Company should maintain records on the number of instances that the auto-dialer is used to call customers in these circumstances so that one may determine whether use of the auto-dialer improves APS' access to "no access" meters. The results of the pilot program should be reported to the Commission in quarterly reports. [Refers to Finding III-12]

III-7 APS should implement a pilot program to evaluate whether scheduling appointments with "no access" account customers results in a reduction of estimated reads due to "no access" problems. The results of the pilot program should be reported to the Commission in quarterly reports. [Refers to Finding III-12]

III-8 APS should be required to implement a policy to ensure that meter reading supervisors periodically inspect meter locations reported as "no access" to verify that appropriate corrective measures are taken. APS should be required to file a copy of this policy with the Commission within ninety days of a decision in this matter. [Refers to Finding III-12.]

CHAPTER IV

Usage Estimation and Billing

This chapter evaluates the practices employed by APS to estimate usage, issue bills and manage billing exceptions.

A. BACKGROUND

The Meter Reading Department provides meter reading data from routes organized on 21 billing cycles each month. Meter readers enter read data into the Itron HHC that is downloaded daily into the Customer Information System (CIS). Once the billing date is reached for the billing cycle, CIS creates bills for that cycle in a batch process.

CIS programming includes screening for accounts that do not meet specific criteria for issuing a bill. CIS identifies bills that do not pass the validation checkpoints. These are known as billing exceptions. CIS creates billing exceptions that are filed in online "in-baskets" by billing cycle. Each workday, an associate in the APS Billing Services Department assigns the billing exceptions to individual billing consultants for completion that day.

The Billing Services Department includes billing consultants, also known as billing service representatives (BSRs). The beginning classification that works simpler, less complex billing exceptions is BSR I. BSRs progress to the next classification level as openings occur and then work on the more difficult billing exceptions. The BSR is not normally an entry-level position at APS. Oftentimes, individuals transfer to the Billing Services Department after working as a customer service representative in a local office or at the call center.

The Billing Services Department provides BSRs with classroom and on-the-job training. The classroom training objectives seek to familiarize the individual with the CIS, the billing process, and Billing Services Department procedures. After receiving classroom training, the new billing consultants work under the direction of a more senior employee in the department until they are ready to tackle individual assignments. The Billing Services Manager estimated that a billing consultant gains experience and speed in processing billing exceptions after about six months on the job.

When a customer's usage (kWh) is estimated, the next actual meter reading will true-up the amount billed to represent actual kWh during the period between actual meter readings. This same true-up process is not available for demand (kW). When demand is estimated, the registered demand obtained in the next actual meter reading cannot true-up the estimated demand because it is impossible to determine in which month the high demand occurred.

There are several approaches that can be used to estimate demand. One approach uses the relationship between kWh and load factor, to provide the following formula:

Estimated Demand (kW) = (kWh usage)/ (Load Factor * No. Of Read Days * 24 hours)

Load factor is a relationship between energy usage and energy demand. Load factor indicates how efficiently the customer is using peak demand. According to the US Department of Energy - Energy Efficiency and Renewable Energy (EERE), load factor is the ratio of average energy demand (load) to maximum demand (peak load) during a specified period.[22] Load factor measures how well the electrical capacity demanded from the utility is utilized by the load over a period of time. For example, it tells whether electrical usage is reasonably stable or if it has significant peaks and valleys.[23]

A high load factor usually results in a lower average price per kilowatt-hour than a low load factor. Utility regulation allows energy suppliers to apply a demand charge to each customer's electric bill that reflects the proportionate investment in power generation capacity needed to meet that customer's maximum load requirements, or peak demand. The demand charge, unlike the energy charge, is a fixed cost that does not vary according to the number of kilowatt hours consumed during the billing period. To the extent that a customer's load factor is relatively high, meaning that their load runs consistently at or near their peak demand, the demand charge will represent a smaller percentage of the overall cost of energy consumed.

APS calculated the load factor for individual customers using a formula that is consistent with load factor formulas used in the electric utility industry. The old CIS used information to calculate estimated demand based on kWh and load factor based on the customer-specific data. Load factor was defined as the percentage of maximum kWh (based on kW) that was actually used. Load factor was calculated as:[24]

Load Factor (LF) = kWh/ [kW * Number of read days * 24 hours]

Average Load Factor (ALF) =

(First Previous Month LF + Second Previous Month LF + LF for Same Month Last Year)/3

Estimated Demand (kW) = (kWh usage)/ (ALF * No. Of Read Days * 24 hours)

Table IV-1 presents a timeline of the key changes in APS billing processes since the implementation of the new CIS in September 1998.

[22] Downloaded on 11/15/2004 from http://www.eere.energy.gov/consumerinfo/energyglossary.html#L and from http://www.retailenergy.com/articles/loadagg.htm on December 19, 2004.

[23] An example from the airline industry provides another way to consider load factor. That industry compares airline seating capacity (that is actually used and sold) with the available seating. Airlines compute load factor by dividing the number of revenue paying passenger miles flown by available seating miles flown.

[24] Based on response to Staff DR 1-5, APS06469

Table IV-1
Timeline of Key Changes in Billing Process
1998-2004

Timeframe	Change in Billing Process
9/18/1998	New CIS System implemented by APS.
3/9/1999	CIS programmed to calculate estimated demand using class average load factors for specific rate schedules.
10/2/2000	Policy on providing Blue Cards to "no access" customers was implemented.
11/21/2000	Customer Services Associate Training Guide revision was issued.
11/30/2000	Billing Services Department decided to instruct billing consultants to use the same method as CIS for calculating estimated demand.
After 12/2000	Excel Prorater spreadsheet was revised to include class average load factors.
5/8/2001	CIS modified to include four additional "no read" messages on the bill.
5/18/2001	APS determined that Billing Exception 116 "No Estimate, Consecutive Reads, and Customer Reads Exceed Limit" was not performing correctly.
6/5/2001	CIS change #6133 implemented – CIS was changed to display accounts with greater than three consecutive estimated reads.
8/9/2001	An APS team issued the Billing Exception Review final proposal after review of estimating procedures and exceptions. One conclusion reached was that one of the billing exceptions had validation parameters set too high such that many bills that should have had exceptions went directly to the customer without review.
8/13/2002	APS internal audit department issued report regarding CIS Compliance to ACC Rules and Regulations Audit. Findings included: • Current processes not designed to deal with all access issues and mainly focused on Metro Phoenix residential accounts. • Access issues exist for all service plans and are not limited to TOU accounts. Access issues for non-residential accounts have grown substantially since March 1999. • Customer accounts were being estimated for more than three consecutive months. This was fixed in July 2002. • Estimating meter readings and demands for non-residential accounts presents risk of under billing or over billing.
8/24/2002	APS changed class average load factors in CIS to lower values based on load research surveys.
9/5/2002	APS Billing System Estimating Rules drafted.
2003	APS implemented the Billing Estimator Tool that is used by billing consultants, on APS Intranet.
1/2003	Division Managers met and agreed to adopt consistent policy for addressing meter access issues.
9/2003	Billing Exception 193 implemented. It identified accounts when current kW obtained from actual read is less than estimated kW using last month.
10/2003	APS identified and corrected an error in the calculation of on-peak hours used to estimate demand for customers provided service under rate schedule ECT-1R. This error resulted in the underestimation of demand.

B. WORK TASKS

As part of our review of APS' usage estimation and billing practices, BWG interviewed two BSRs. In the presence of BWG and Commission Staff, these BSRs logged onto the CIS and demonstrated some of the procedures that APS uses for processing billing exceptions. They took actual billing exceptions that had been assigned that day from the CIS online "in-basket" and went through the steps needed to process those billing exceptions.

BWG also interviewed the billing services quality assurance coordinator and billing services department management. We reviewed trends in billing services expenditures and staffing levels, and we reviewed controls in place to assure that all billing exceptions are properly identified and worked on a timely basis. We also gained an understanding of Company procedures for estimating demand (kW) and energy consumption (kWh) and how these practices have changed over time.

C. FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

C.1. EVALUATIVE CRITERIA: DOES THE BILLING SERVICES DEPARTMENT HAVE SUFFICIENT RESOURCES AND CONTROLS TO PROCESS BILLING EXCEPTIONS AND PERFORM OTHER REQUIRED BILLING-RELATED ACTIVITIES APPROPRIATELY AND ON A TIMELY BASIS?

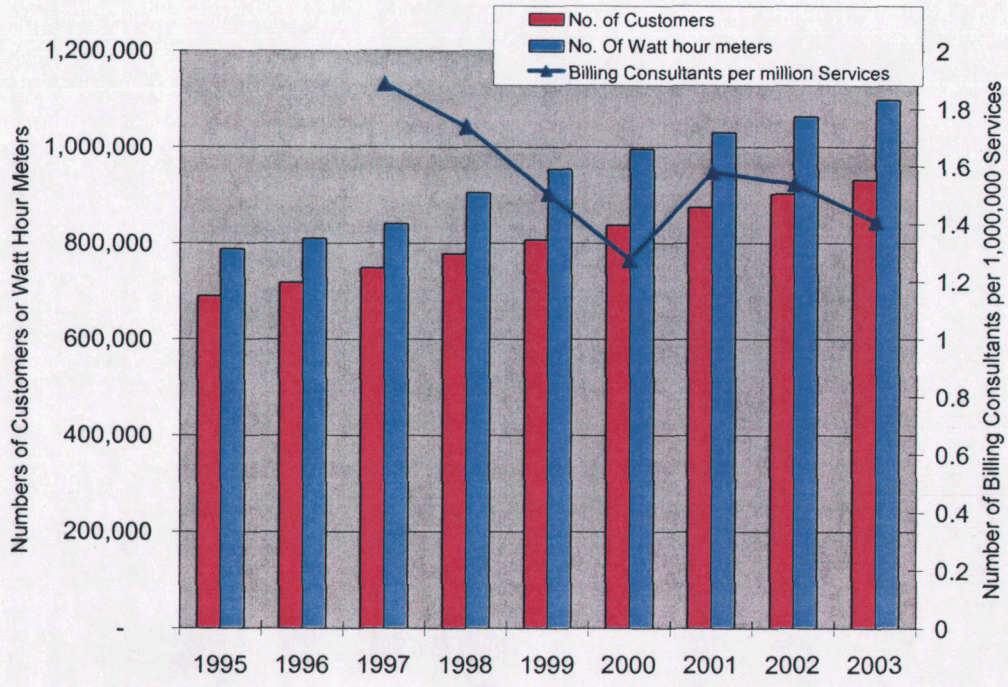
1. APS has had approximately the same number of BSRs over the past three years.
   - The number of billing consultant resources declined slightly during the years 1997-2000, but has remained relatively level during the years 2001 to 2004.
   - In 1997, there were 18 BSRs in the billing services department. In 2003, the number of billing services representatives was once again at 18 after having dropped to 14 in 2000. When normalized by numbers of services, "billing consultants per million services" declined over the years 1997 to 2000, increased during 2001, and then decreased since 2001 most likely due to annual customer growth rates of three to four percent. (See **Tables IV-2** and **IV-3** below).

Table IV-2
APS Billing Services Department Headcount Comparisons
1997-2003

Year	Billing Consultants Headcount	No. Of Customers	Number of Services	Billing Consultants per No. Of Customers	Billing Consultants per Million Services
1997	18	748,128	9,544,868	2.4	1.9
1998	17	777,674	9,790,513	2.2	1.7
1999	16	806,638	10,639,638	2.0	1.5
2000	14	837,130	10,973,097	1.7	1.3
2001	18	874,603	11,392,613	2.1	1.6
2002	18	902,096	11,705,001	2.0	1.5
2003	17	931,528	12,078,271	1.8	1.4

Source: Response to Staff 1-2, Staff 6-8 (FERC Form 1)

Table IV-3
APS Billing Services Department Headcount Compared with Numbers of Meters and Customers
1997-2003



Source: Response to Staff DR 1-2, 6-6, and 6-8 (FERC Form 1 data from 1995-2003)

Table IV-4
APS Billing Services Department Costs per Customer
1997-2003

Year	Billing Consultants Headcount	No. Of Customers	Billing Services Expenses ($000)	Billing Services Costs per Customer	Percent Increase Over Prior Year
1997	18	748,128	$ 792	$1.06	
1998	17	777,674	$ 875	$1.13	6.3%
1999	16	806,638	$ 897	$1.11	-1.2%
2000	14	837,130	$ 1,188	$1.42	27.6%
2001	18	874,603	$ 1,159	$1.33	-6.6%
2002	18	902,096	$ 1,109	$1.23	-7.2%
2003	17	931,528	$ 1,248	$1.34	9.0%

Source: Response to Staff 6-6, Staff 6-8 (FERC Form 1)

2. The Billing Services Department's budgets and actual expenditures were not significantly reduced during the period 1995-2004.

   - On a department-wide basis during the period of 1995-2004, the Billing Services Department budget increased each year, with the exception of 2002 when it decreased by two percent. However, when the departmental costs are normalized for the number of customers in the service territory, the unit costs have fluctuated over the period, with a sizeable increase in budget during 2000.
   - As indicated in **Table IV-5**, actual billing services department expenditures from 1997 through 2003 have consistently exceeded budget, which may suggest that there is no undue pressure on this department to avoid exceeding its budget.
   - Billing Services Department expenditures expressed as a cost per customer increased by 26 percent from 1997 to 2003. (See **Table IV-5)**.
   - The budgets developed by APS are provided on an organizational basis, such that budgeted expenditures are provided by cost categories such as labor, overtime, materials, and loads, while costs by activity or budgeted program are not available. Consequently, BWG was not able to verify the costs of individual billing department activities.

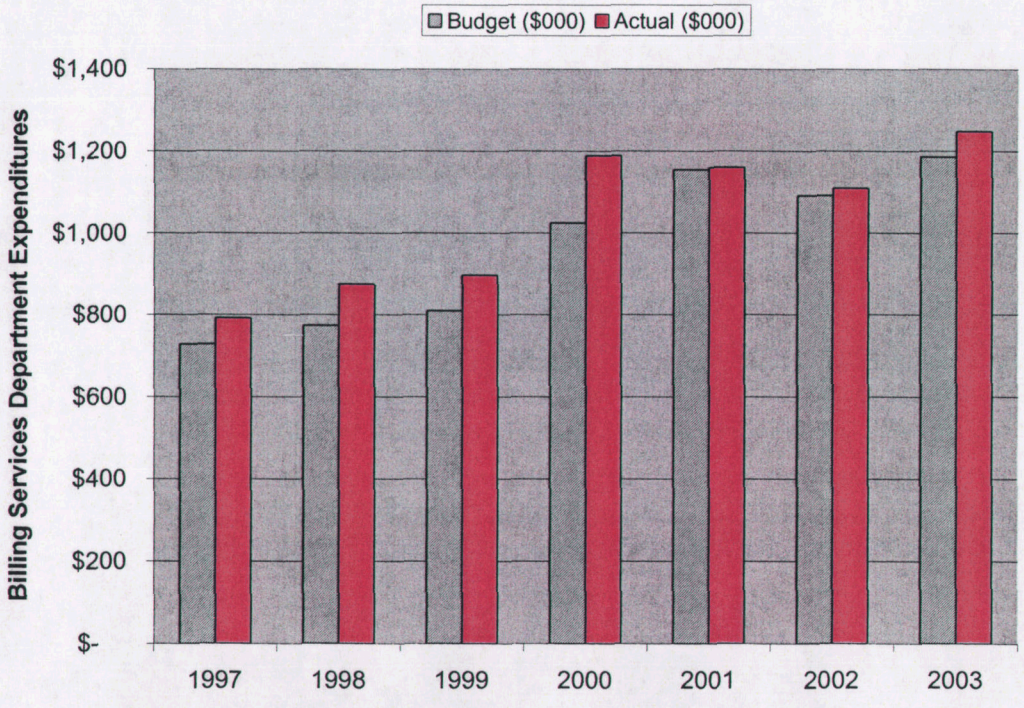
Table IV-5
APS Billing Services Department Costs per Customer
1997-2003

Year	Billing Consultants Headcount	No. Of Customers	Billing Services Expenses ($000)	Billing Services Costs per Customer	Percent Increase Over Prior Year
1997	18	748,128	$ 792	$1.06	
1998	17	777,674	$ 875	$1.13	6.3%
1999	16	806,638	$ 897	$1.11	-1.2%
2000	14	837,130	$ 1,188	$1.42	27.6%
2001	18	874,603	$ 1,159	$1.33	-6.6%
2002	18	902,096	$ 1,109	$1.23	-7.2%
2003	17	931,528	$ 1,248	$1.34	9.0%

Source: Response to Staff 6-6, Staff 6-8 (FERC Form 1)

- **Table IV-6**, however, indicates that billing services department expenditures have not kept pace with customer growth.

Table IV-6
APS Billing Services Department Budget vs. Actual Expenditures
1997 – 2003



Source: Response to Staff DR 6-6

3. The Billing Services Department has improved the documentation of its processes and is beginning to track the productivity of BSRs.

- Over the period of 1995-2004, APS has increased the extent to which it has documented policies, procedures, and processes in the Billing Services Department related to estimating and prorating bills.
- BSRs interviewed stated that during 2004 they have been able to routinely complete all billing exceptions assigned to their in-basket on a daily basis.
- The development of the Billing Estimator and Prorater software tools appear to have improved productivity as well as increased the consistency of actions taken by the BSRs. During 2004, the Billing Services Department began to record "Adjusted Exceptions Worked per Hour" by each BSR and is tracking the median and average number of adjusted exceptions worked per hour.

4. APS implemented a quality control function within its Billing Services Department during 2003.
   - The quality monitoring includes quarterly review of billing consultant work samples.
   - The quality control analyst works at a different location from the billing consultants, which limits her ability to provide face-to-face interaction with the BSRs.
   - The quality control analyst indicated that the types of errors she has noticed during the reviews have included incomplete noting of customer accounts and ensuring the correct correspondence has been sent to the customer.
5. The timing of APS' improvements to its billing estimation processes appears to be reactive to the ongoing litigation activities, rather than proactive in nature.
   - June 2002 – APS works on printing "estimate" on bills;
   - July 2002 – APS corrects CIS programming regarding Billing Exception 116, No Estimate, Consecutive Reads, and Customer Reads exceeds limit;
   - September 2002 – APS first drafts APS Billing Services Estimating Rules;
   - June 2003 – APS implements door hanger and revises "no access policy" to include steps for each month of no access; and
   - September 2003 – APS implements Billing Exception 193 that identifies accounts when the current kW demand obtained from an actual read is less than the kW demand estimated by CIS.

C.2. EVALUATIVE CRITERIA: ARE USAGE ESTIMATION AND BILLING PRACTICES CONSISTENT WITH COMMISSION RULES, REGULATIONS, AND SPECIFIC TARIFF PROVISIONS?

6. Although both the old CIS and the new CIS estimate demand based on load factor, the underlying information used to calculate the load factor changed in March 1999.
   - When the new CIS was implemented in March 1999, APS did not prepare any studies to determine the potential impact on an individual customer's bill. Using its load research data, APS assumed that overestimated accounts would

be offset by a comparable number of underestimated accounts. Yet, APS did not to our knowledge perform any analysis of this assumption until the fall of 2004, when analyses were completed and the results were provided in David J. Rumolo's November 23, 2004 testimony. At that time, Mr. Rumolo presented an analysis that calculates demand using the old CIS methodology (i.e., customer-specific load factors) and compares those results to actual demand readings. The study results presented do not describe the extent to which individual customer load factors vary from the class average. By presenting only the net dollar impact of the differences between current and historical, or tariff required, estimating practices, Rumolo's testimony does not fully describe the impact of the current estimating practices on individual customers. However, this analysis was more thorough than that performed by APS when it originally selected the class average load factor method for estimating demand.

- The old CIS used information to calculate estimated demand based on kWh and load factor. Load factor was defined as the percentage of maximum kWh (based on kW) that was actually used. Load factor was calculated as:[25]

  Load Factor (LF) = kWh/ (kW * Number of Read Days * 24 hours)

  Average Load Factor (ALF) =

  (First Previous Month LF + Second Previous Month LF + LF for Same Month Last Year) / 3

  Estimated Demand (kW) = (kWh usage) / (ALF * Number of Read Days * 24 hours)

  APS calculated individual customer load factor using a formula that is consistent with load factor formulas generally used in the electric utility industry.

- The main difference between the load factor calculations in the old CIS and the new CIS is that the old CIS calculated load factor based on individual customer data or data from similarly situated customers (such as neighbors) when reliable customer-specific data was not available. For example, the formula for load factor in old CIS used kWh from the two prior months and the same month from the prior year. In the new CIS, the load factor calculation uses class average load factor instead of customer specific load factor. BWG is currently analyzing the impact to customers of making this change.

- APS performs load research surveys periodically as part of the Pricing Department functions.[26] APS has installed interval data recorders (IDRs) at a sample of customer premises for different customer classes. APS uses data from the IDRs for its load research studies because IDRs sample load information on fifteen-minute intervals rather than the sixty-minute intervals used by many customer meters. Using the load data, the Pricing Department calculates load factors for different customer classes. BWG verified that the

[25] Based on response to Staff DR 1-5, APS06469

[26] Based on response to Staff DR 8-2.

load factor studies completed by APS subsequent to its 2002 Base Year load research study confirm the class average load factors that APS uses in the CIS. The 2002 Base Year load research data are also used in the Company's pending general rate case.

- APS stated that it believes that the use of class average load factors provides a reasonable, fair, and unbiased demand estimate when applied to energy consumption (kWh) estimated using customer specific historical data.[27] While APS indicated that individual customer demand tends to be more volatile than individual customer energy consumption, it concluded that a demand estimate methodology that utilizes only customer specific demand data does not provide a more accurate estimation of the customer's actual demand usage.

7. APS' estimating practices have changed over time, and it has not routinely notified the Commission in advance of each change.

   - APS has represented that its procedures for estimating and billing demand have always differed from those provided in the tariff for EC-1 and ECT-1R[28]. The following paragraph is an excerpt from APS Rate Schedule EC-1, "Residential Service with Demand Charge", that was originally effective May 1, 1981. In his testimony dated November 23, 2004 for Docket E-01345A-03-0775, David Rumolo indicates that APS does not determine the kW demand as described in the Rate Schedule.

     > "DETERMINATION OF KW CAPACITY
     >
     > The average kW supplied during the 60-minute period of maximum use during the month, as determined from readings of the Company's meter. In the event the meter is inaccessible to the meter reader due to locked gates or because of safety limitations, the kW shall be that measured since the last resetting of the kW dial. If the kW dial was not reset, the Customer may request a resetting to zero for a charge of $10 per trip. However, the request from the Customer must be within three (3) days of notification by APS that the meter reader was unable to reset the kW dial. The kW dial will be reset to zero, unless the registered kW at the reset time is greater than the registered kW at the last scheduled reading. The billing kW shall be the kW registered on the kW dial at the next scheduled reading."[29]

   - The change to class average load factors was a further variance from the tariff language and was not approved by the Commission. APS unilaterally adopted differences in calculating demand without ACC approval. APS did not comply with its filed tariffs that included procedures for handling missing demand reads.

---

[27] Based on response to Staff DR 8-3.

[28] Based on response to Staff DR 8-15, APS06611 and testimony of David M. Rumolo of November 23, 2004.

[29] Based on response to Staff DR 8-15, APS06611, rate schedules

- APS did not notify the Commission as it continued to enhance or refine its procedures when it:
  - Adopted the class average load factor in calculations of estimated demand in March 1999.
  - Decided to estimate demand rather than use the demand readings as described in the two rate schedules EC-1 and ECT-1R.
- APS has used a class average load factor to estimate demand since March 1999, approximately six months after the implementation of the new CIS.
- The old CIS in operation prior to September 14, 1998 provided information for calculating demand using individual customer load factor.
- APS assumes that the differences in use of class average as compared to individual customer load factor will not significantly impact an individual customer by either over-billing or under-billing the customer. APS did not confirm this conclusion with analyses until these analyses were completed and discussed in David J. Rumolo's testimony filed on November 23, 2004.
- At the time CIS was implemented in September 1998, and including the period prior to March 1999, APS elected not to modify CIS to include calculation of individual customer load factor.
- APS' estimation methods that use a class average load factor are not consistent with the practices of other electric utilities that use class average customer load factors only after the other alternatives for determining an appropriate customer-specific load factor have been ruled out. There is an insufficient number of electric utilities that have demand-billed residential customers to characterize any practice as an "industry standard."

Recommendation:

IV-1. APS should be required to obtain Commission approval of its estimation procedures as a tariff filing. [Refers to Finding IV-7.]

C.3. EVALUATIVE CRITERIA: ARE CUSTOMERS HARMED BY THE METHODOLOGIES BEING USED TO ESTIMATE DEMAND?

8. While APS does not adjust estimated demand upward if the subsequent actual demand reading is higher than the estimate, it has not always routinely adjusted the demand estimate downward if the subsequent actual demand reading is lower than the estimate.
   - Interviews, observations of billing consultants working on billing exceptions, and the analysis of billing estimation methods provided by the Manager of Pricing indicate that APS does not re-bill the customer when an actual demand read is higher during the month following an estimated bill.
   - The Manager of Transaction Processing indicated that the Company does not re-bill the customer using the higher demand in instances where demand is higher the month following an estimated bill. If the actual kW demand read is

lower, the billing consultants will issue a customer credit for the difference. It should be noted that the method of relying on the next actual demand read as a criterion for determining whether the previous month's demand estimation should stand has an inherent weakness due to effects of seasonality and may result in demand being overestimated.

  - A naturally occurring phenomenon of rising demand that occurs in months approaching summer may reduce the possibility that overestimated demand will be discovered. For example, if a demand is overestimated in May, an actual read taken in June may not reveal the earlier overestimation because the June demand is likely to greater than the May demand. Therefore, it becomes less likely that such an overestimated demand will be credited as a result of a next month's demand comparison.
  - BWG reviewed the number of estimated bills by month for the residential demand (EC-1 and ECT-1R) and general service demand (E-32) rate schedules for the period 1995 through 2004 to determine whether there were trends in the numbers of estimated bills that might suggest that APS was taking advantage of the naturally occurring phenomenon of rising demand described above. BWG found no evidence of trends to support the allegation that APS manipulates the demand estimating process to its own advantage.

- During demonstrations of the CIS, two billing consultants consistently used these procedures as they processed billing exceptions from that day's "in-basket."
- In September 2003 APS implemented a change to CIS whereby the system now routinely identifies and reports accounts where a previous month's estimated demand is higher than the actual demand reading. APS decided not to retroactively identify those customers whose accounts were not credited in similar situations.

Recommendation:

IV-2. APS should evaluate the extent to which customers were over-billed or under-billed during the period 1998-2003. APS should identify those customers who are due credits because their estimated demand was not adjusted downward when the actual demand read came in less than the estimate. APS should also be required to provide a credit to customers who were over billed. Within ninety days of a decision in this matter APS should file a report that details the results of its analysis and identifies mechanisms by which it could provide refunds to customers who were over billed. [Refers to Finding IV-8.]

C.4. EVALUATIVE CRITERIA: WAS THE NEW CIS IMPLEMENTED IN A MANNER THAT DID NOT ADVERSELY AFFECT APS' ABILITY TO ESTIMATE BILLS EFFECTIVELY?

9. We could not determine whether APS recognized prior to implementation that its new CIS, which was initially developed by IBM for another electric utility, had different billing exceptions for consecutive monthly estimates than ACC rules required.

   - Information regarding the new CIS design specifications was not available. In addition, the individuals responsible for managing the new CIS project have retired from or left the Company.
   - The other utility's version of CIS identified accounts consecutively estimated at the fourth month, rather than the third month of consecutive estimates as required to facilitate compliance with ACC rules.
   - It is not clear that this difference in compliance requirements was identified at the time of new CIS implementation. For example, billing exceptions were not generated for customers who received estimated bills for three consecutive months. Instead, until May 2000, billing exceptions were generated in the fourth consecutive month of estimating, rather than in the third month. APS intended to fix the system by May 2000; however, the problem was not completely fixed until July 2002.
   - On the other hand, it does appear that the existing functionality of the new CIS included estimating kWh based on a customer-specific six month seasonal average rather than using a customer's prior month or same month last year usage, and that APS chose to accept this functionality rather than use customer specific prior month or same month last year usage similar to the old CIS.

10. APS had problems with printing the reason for estimates on both the old and new CIS.

    - Difficulties in notifying customers of estimated bills persisted over time, despite the fact that this issue was identified in a 1996 Internal & Systems Audit report. In the report, which was requested by the APS Vice President of Customer Services, one key recommendation involved notifying customers when APS was unable to reset their demand meter or when any portion of their meter reads was estimated. The report recommended that the new CIS be designed to print "estimated" next to the portion of the reads that are estimated.
    - APS identified concerns that customers must be informed about estimated bills by printing information on the customer's bill several times between 1996 and 2002. Some issues continued to require resolution during July 1999, and were further studied during 2001.
    - According to a subsequent Internal Audit report issued in 2002, these problems were finally resolved in 2002. The Audit Services Department has no time budgeted for either 2004 or 2005 for the review of usage estimation, meter reading, or billing practices.

11. Since the implementation of the new CIS in September 1998, it has taken APS significant time and effort to align the new system with desired business practices.

- The reasons for this could include difficulties with CIS system implementation and failure to place a sufficiently high priority on resolving some inconsistencies in the processing of billing exceptions that involved prorating and estimating customers' bills.
- During the implementation of the new CIS, problems occurred with the generation of large numbers of billing exceptions and with execution of bills. Because the new CIS did not automatically estimate and generate bills for estimated demand, billing consultants performed these calculations manually.
- During the period of September 1998 to March 1999, the calculations continued to be performed manually. In November 2000, APS identified a need to bring consistency between manual calculations performed by billing consultants and automatic calculations performed by new CIS.
- Sometime after December 4, 2000, an Excel spreadsheet was modified to align the manual calculations with the system calculation. However, BWG was unable to verify that the Excel spreadsheet was developed prior to December 4, 2000. In its present form, the spreadsheet is referred to as the Prorater.
- Interviews with the quality control analyst, CIS senior programmer, Billing Services Manager, and others indicated that the new CIS implementation period was hectic.
- Billing Services workloads were affected when tasks such as training on the new system, fixing intermittent bugs, and developing changes to streamline the number of billing exceptions identified by the system were added to the regular workload.

12. APS could not provide evidence that design criteria or technical specifications for the new CIS adequately reflected requirements for estimating customer bills.
    - The system did not create a billing exception following the third consecutive estimate rather than the fourth consecutive estimate.
    - The system did not estimate demand charges in the absence of an actual demand reading.
    - The system did not generate a bill notice each time an estimated bill was rendered and properly indicate the reason for the estimate.

Recommendation:

IV-3. APS' Audit Services Department should include on-going testing of usage estimation, meter reading and billing practices in its annual audit plan, and ensure that APS has completely implemented findings reported in previous audit reports. APS should file the results of its internal audits with the Commission [Refers to Finding IV-10]

CHAPTER V

Comparative Practices

In this Chapter of the report, we compare APS' meter reading and billing practices to industry practices to determine if APS' bill estimation procedures and meter reading policies are reasonable.

A. BACKGROUND

APS has more than 160,000 customers billed both demand (kW) and usage (kWh) on a monthly basis. APS believes that it has more residential demand-billed customers than any other electric utility in the country.

B. WORK TASKS

To complete this section of the project work plan, BWG completed research, contacted other utilities, and contacted other utility regulatory commissions to identify industry practices related to usage estimation, meter reading, and billing. We then compared these industry practices to practices in place at APS to determine whether its practices are consistent with industry standards.

- On November 2, 2004, Staff sent data requests to all electric utilities operating in the State of Arizona requesting a detailed description of each utility's meter estimation process.
- BWG compiled information publicly available on state utility regulatory agency and electric utility websites related to rules and regulations and terms and conditions of service related to meter reading and billing. See **Appendix B** for a complete listing of the information compiled.
- BWG also contacted several electric utilities, including several electric utilities providing service to customers located in southern and southwestern states, to obtain more detailed information regarding their usage and demand estimation, meter reading and practices. These results are summarized below. See **Appendix E** for a complete summary of the responses received.
- In addition, on November 26, 2004, Staff sent letters to fifteen other state utility regulatory commissions requesting information related to usage estimation, meter reading, and billing practices in their jurisdictions.

C. FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

C.1. EVALUATIVE CRITERIA: ARE APS' USAGE ESTIMATION, METER READING, AND BILLING PRACTICES CONSISTENT WITH THOSE OF OTHER ARIZONA ELECTRIC UTILITIES?

1. APS estimates kWh using a six-month seasonal average kWh per day, and APS is the only electric utility in Arizona that uses a six-month seasonal average to estimate kWh.

- If not available, APS will use prior month kWh. If prior month data is unreliable, APS will use the same month in the prior year. Tucson Electric Power Company (TEP) will estimate kWh based on trend data for the prior three months or will use the same month last year if trend data is not available. Absent the availability of six-month seasonal information, APS uses the average kWh per day from the previous month in the same season, or the same month in the previous year if the previous month information is unreliable.
- Prior to the implementation of the new CIS, APS estimated kWh primarily using either the prior month or the same month last year.
- Other than TEP, most electric utilities in Arizona estimate kWh using the prior month or the same month in the prior year. APS' use of a six-month seasonal average would include both the prior month (if in the same season) and the same month last year (in all cases).
- If there is no history, APS estimates kWh using a flat 20 kWh per day. TEP estimates kWh using average daily consumption for the same rate schedule. Other utilities may wait until an actual meter reading is obtained and bill for the entire period at that time.

2. While APS estimates demand using customer-specific kWh and a class average load factor, TEP manually estimates demand using this month's actual or estimated kWh and a customer-specific load factor calculated from the same month from the prior year.
   - APS is the only electric utility in Arizona that uses a class average load factor to estimate demand.
   - Other utilities use prior month(s) kW or may wait until the next actual kW reading to bill.
   - **Table V-1** presents APS' usage estimation practices for the thirteen scenarios described in Staff DR 5-1. These practices are then compared to the practices of the other Arizona electric utilities under the jurisdiction of the ACC. A compiled list of the responses received is included as **Appendix C**.

Table V-1
Comparison of APS' Estimating Practices with Other Arizona Electric Utilities

1. A kWh estimate with at least one year of history. Same customer at same premises or new customer with at least one year of premises history.	
APS	The APS CIS calculates the average usage per day for the entire season that includes the period for which there is a missing read. The resulting per day usage is multiplied by the number of days in the missing read billing period to yield the estimate of usage for that period. This seasonal average method requires retrieval of the customer's total kWh and the total number of days for the most recent six months for the season of the missing read from CIS. This method would

	include the customer's previous month and the same month of the previous year if those months are applicable, i.e., is in the same season. In all instances, it would encompass the same month from the prior year. The months in the two billing seasons are: Winter November-April Summer May-October This same procedure is used for both residential and non-residential customers on Rates E-32, E-221 and E-38. All other non-residential customers are not estimated by CIS. Because there are very few instances when these accounts have missing reads (both because there are relatively few customers on these rates and we have little or "no access" issues), a billing exception is sent to a billing representative in the Billing Services Department, who issues a request for another visit to read the meter. If a valid meter read still cannot be obtained, the account is estimated by the billing representative by using the customer's billing history, usually billing determinants from the previous month (if it is in the same season) or same month in the previous year.
TEP	TEP would generate a bill based on customer usage from the previous year using the following formula: LAST YEAR'S USAGE FOR SAME MONTH DIVIDED BY NUMBER OF DAYS IN BILLING PERIOD = PER DAY USAGE. PER DAY USAGE X NUMBER OF DAYS IN THIS MONTH'S CYCLE = EST. USAGE. OR The CIS would generate a bill based on trend. Within TEP's CIS, a trend record is created from each billed service. This record becomes part of a trend table. During estimation, consumption from 3 prior bill cycles is compared to the consumption from the same cycle in the previous month to determine a trend. This trend, plus a tolerance, is used to create a usage amount for bill estimation. Circumstances for estimating a meter read occur when TEP is unable to obtain an actual meter read.
Summary of Other Arizona Utility Practices	Combination of average kWh from same month last year, previous month, and previous three months times number of days in current billing period.
2. A kWh estimate with less than 12 months' history. Same customer at same premises.	
APS	APS follows the same formula described in Question #1 when there are at least 165 days of seasonal history for the current customer or previous tenant at the same premise. When there is less than 165 days of seasonal history, the CIS generates a billing exception and a billing representative manually estimates the bill using either the previous month method or the same month previous year method as described below. <u>Previous Month Method</u> This method is used when there is not sufficient account history to use the Seasonal Average Method, but there is account history for the previous month in the same season as the missing-read month. This method calculates the estimated daily energy usage (kWh) from the previous month and multiplies it by the number of days in the missing-

	read billing period, Same Month Previous Year Method This method is used when there is insufficient account history to use the Seasonal Average Method and the previous month's data is unreliable (e.g., instances where prior month was also estimated or where recent meter tampering is suspected) or is in a different season than the missing-read month. This method is identical to the previous month usage method described in the response to Question 2, except that usage and number of days from the same month in the previous year are used to estimate the energy usage for the missing-read period, rather than usage and number of days from the previous month in the same year. These same procedures are used for both residential and non-residential customers on Rates E-32, E-221 and E-38.
TEP	If there is at least three months of data, the CIS would generate a bill based on trend. Within TEP's CIS, a trend record is created for each billed service. This record becomes part of a trend table. During estimation, consumption from three prior bill cycles is compared to the consumption from the same cycle in the previous month to determine a trend. This trend, plus a tolerance, is used to create a high and a low value for meter read validation and a usage amount for bill estimation. If three months of data do not exist, CIS will use the rate schedule average daily usage to calculate customer's bill. If manually estimated, TEP would use the prior month's data and manually estimate consumption by using the following steps: (i) calculate per day usage, (ii) prior month consumption divided by number of days in cycle, and (iii) multiply number of days in the current month's cycle by per day usage. Circumstances for est. a meter read occur when TEP is unable to obtain an actual meter read.
Summary of Other Arizona Utility Practices	If available, average consumption per day during the prior three months will be calculated and applied to the number of days in the current billing period. If less than 3 months history is available, the prior month or 45 day period will be used.
3. A kWh estimate with less than 12 months' history. New customer with premises history.	
APS	The CIS calculates the estimated usage using the same procedures as the responses to Question #1 or Question #2 based on the history of the previous tenant at the same premise. These same procedures are used for both residential and non-residential customers on Rates E-32, E-221 and E-38.
TEP	The CIS would generate a bill based on trend. Within TEP's CIS, a trend record is created from each billed service. This record becomes part of a trend table. During estimation, consumption from three prior bill cycles is compared to the consumption from the same cycle in the previous month to determine a trend. This trend, plus a tolerance, is used to create a usage amount for bill estimation. If manually estimated, TEP would use the prior month's consumption and use the following steps: (i) calculate per daily usage divided by number of days in cycle and (ii) multiply number of days in this month's cycle by per day usage. Circumstances for estimating a meter read occur when TEP is unable to obtain an actual meter read.
Summary of Other	If available, average consumption per day during the prior three

Arizona Utility Practices	months will be calculated and applied to the number of days in the current billing period. If less than 3 months history is available, the prior month or 45 day period will be used. Some utilities use only customer-specific, not premises-specific history to estimate consumption.
4. kWh estimate. No history.	
APS	The CIS generates a billing exception for a billing representative to estimate the bill. For customers when there are 10 or fewer days in the missing-read billing period, a bill is produced for zero usage. When there are more than 10 days in the missing-read period a bill is produced based on a flat 20 kWh per day. These same procedures are used for both residential and non-residential customers on Rates E-32, E-221 and E-38. On the very rare occasions when a new, larger E-32, E-221, or E-38 account or a new account not on these rates has missing reads, the billing representative issues a request for another visit to read the meter. If a valid meter read still cannot be obtained on the second visit, a bill for zero usage is issued and a new meter installed. The zero usage bills will be estimated and rebilled by a billing representative by using the billing data from the subsequent month's read.
TEP	The CIS will estimate based on a rate schedule average daily usage. A manual estimation would be done using new meter usage methodology. TEP would wait until it gets a good read on the new meter and use the following formula: NEW METER READ – BEGINNING READ x METER CONSTANT divided by NUMBER OF DAYS = PER DAY USAGE. PER DAY USAGE x NUMBER OF DAYS IN PREVIOUS BILLING PERIOD = ESTIMATED USAGE. Circumstances for estimating a meter read occur when TEP is unable to obtain an actual meter read.
Summary of Other Arizona Utility Practices	Most do not estimate kWh usage and will only bill the service charge / minimum bill. Some will estimate using averages from similar customer groups.
5. A kW estimate with at least one year of history. Same customer at same premises or new customer with one year of premises history.	
APS	The rate class average monthly load factor is applied to the estimated energy as described for non-TOU customers in the response to Question 1 and for TOU customers as described in the response to Question 9. The rate class average monthly load factors used for demand estimations are: Rate EC-1: 35% applied to estimated monthly energy Rate ECT-1R: 42% applied to estimated monthly on-peak energy Rate E-32, E-221, E-38: 50% applied to estimated monthly energy Estimated demands for customers on all other rate schedules are calculated manually by the billing representatives. These same procedures are used for both residential and non-residential customers on Rates E-32, E-221 and E-38.
TEP	The CIS doesn't estimate kW; therefore all situations are manually estimated. If consumption data is available the following formula is

	used: SAME MONTH LAST YEAR DEMAND divided by SAME MONTH LAST YEAR CONSUMPTION = LOAD FACTOR THIS MONTH'S CONSUMPTION x LOAD FACTOR=ESTIMATED DEMAND If consumption data is not available, TEP estimates consumption as described in the response to 1 a), then use estimated consumption in the formula. If there is a new customer at the premises, all billing demand meters are also recording interval meters. TEP uses interval premises data to estimate. Circumstances for estimating a meter read occur when TEP is unable to obtain an actual meter read.
Summary of Other Arizona Utility Practices	Various methods including average kW for prior three months, the previous month only, the previous month and same month last year, or the same month last year. None mention using class average load factors. Not clear how many, if any, have demand-billed residential accounts.
6. kW estimate with less than 12 months' history. Same customer at same premises.	
APS	The rate class average monthly load factor is applied (in the manner described in the response to Question 5) to the estimated energy as described for non-TOU customers in the response to Question 2 and for TOU customers as described in the response to Question 10.
TEP	The CIS doesn't estimate kW; therefore all situations are manually estimated. If consumption data is available, the following formula is used: LAST MONTH'S DEMAND divided by LAST MONTH'S CONSUMPTION=LOAD FACTOR THIS MONTH'S CONSUMPTION x LOAD FACTOR=ESTIMATED DEMAND If consumption data is not available, consumption is estimated as described in the response to 1 a) and then estimated consumption is used in the formula. Circumstances for estimating a meter read occur when TEP is unable to obtain an actual meter read.
Summary of Other Arizona Utility Practices	Various methods including average kW for prior three months, the previous month only, the previous month and same month last year, or the same month last year. None mention using class average load factors. Not clear how many, if any, have demand-billed residential accounts.
7. kW estimate with less than 12 months' history. New customer with premises history.	
APS	The rate class average monthly load factor is applied (in the manner described in the response to Question 5) to the estimated energy as described for non-TOU customers in the response to Question3 and for TOU customers as described in the response to Question 11.
TEP	The CIS doesn't estimate kW; therefore all situations are manually estimated. If there is a new customer at premises, all billing demand meter are also recording interval meters. TEP uses interval premises data to estimate. If consumption data is available, the following formula is used:

	LAST MONTH'S DEMAND divided by LAST MONTH'S CONSUMPTION=LOAD FACTOR THIS MONTH'S CONSUMPTION LOAD FACTOR=ESTIMATED DEMAND If consumption data is not available, TEP estimates consumption as in the response to 3 a), then uses estimated consumption in the formula. Circumstances for estimating a meter read occur when TEP is unable to obtain an actual meter read.
Summary of Other Arizona Utility Practices	Various methods including average kW for prior three months, the previous month only, the previous month and same month last year, or the same month last year. None mention using class average load factors. Not clear how many, if any, have demand-billed residential accounts.
8. kW estimate with no history.	
APS	The rate class average monthly load factor is applied (in the manner described in the response to Question 5) to the estimated energy as described for non-TOU customers in the response to Question 4 and for TOU customers as described in the response to Question 12.
TEP	The CIS doesn't estimate kW; therefore all situations are manually estimated. The estimate is done by using like-customer data. TEP calculates like-customers load factors, and then multiplies the current month consumption by load factor to get the estimated demand. If consumption data is not available, TEP estimates consumption as described in the response to 4 a), then uses estimated consumption in the formula. Circumstances for estimating a meter read occur when TEP is unable to obtain an actual meter read.
Summary of Other Arizona Utility Practices	Some will not estimate demand; others will use similar-customer information to estimate demand.
9. Time-of-Use (TOU) estimate with at least one year of history. Same customer at same premises or new customer with at least one year of premises history.	
APS	The on-peak and off-peak energy estimates are calculated in the same manner as described in the response to Question 1 using the customer's on- and off-peak seasonal daily average kWh rather than total seasonal daily average. Non-residential TOU accounts are estimated by a billing representative using the customer's available history.
TEP	TEP would generate a manually estimated bill based on customer usage from the previous year using the following formula: LAST YEAR'S USAGE FOR SAME MONTH divided by NUMBER OF DAYS IN BILLING PERIOD=PER DAY USAGE. PER DAY USAGE x NUMBER OF DAYS IN THIS MONTH'S CYCLE=ESTIMATED USAGE The CIS would generate a bill based on trend. Within TEP's CIS, a trend record is created from each billed service. This record becomes part of a trend table. During estimation, consumption from three prior bill cycles is compared to the consumption from the same cycle in the previous month to determine a trend. This trend, plus a tolerance, is used to create a usage amount for bill estimation. This would be done

	for on-peak usage and off-peak usage. If the estimation falls in a shoulder month then a manual estimation of shoulder would need to be done as the CIS doesn't estimate shoulder usage. The manual estimation would use last year's allocation factor with this year's estimated total consumption. A circumstance for estimating TOU occurs when TEP is unable to obtain actual meter reads.
Summary of Other Arizona Utility Practices	Various methods including average of last three months, previous month, same month last year, or a combination of the above. Two utilities do not have TOU meters.
10. TOU estimate with less than 12 months' history. Same customer at same premises.	
APS	Total monthly energy is estimated in the same manner as described in the response to Question 2. The TOU energy is calculated by allocating the total energy to the on- and off-peak period by the residential TOU average on- and off-peak energy percentages. The seasonal on-peak energy allocation percentages for the residential TOU rates are 40 percent and 30 percent for the summer and winter seasons, respectively. Non-residential TOU accounts are estimated by a billing representative using the customer's available history.
TEP	TEP would generate a manually estimated bill based on customer usage from the previous year using the following formula: USAGE FOR PREVIOUS MONTH divided by NUMBER OF DAYS IN BILLING PERIOD=PER DAY USAGE PER DAY USAGE x NUMBER OF DAYS IN THIS MONTH'S CYCLE=ESTIMATED USAGE The CIS would generate a bill based on trend. Within TEP's CIS, a trend record is created from each billed service. This record becomes part of a trend table. During estimation, consumption from three prior bill cycles is compared to the consumption from the same cycle in the previous month to determine a trend. This trend, plus a tolerance, is used to create a usage amount for bill estimation. This would be done for on-peak and off-peak. If the estimation falls in a shoulder month, then a manual estimation of shoulder would need to be done as CIS doesn't estimate shoulder usage. The manual estimation would use last month's allocation factor with this month's estimated total consumption. A circumstance for estimating TOU occurs when TEP is unable to obtain actual meter reads.
Summary of Other Arizona Utility Practices	Various methods including average of last three months, previous month, same month last year, or a combination of the above. Two utilities do not have TOU meters. Some will use customer-specific only information, not premises-specific information so may not use same month prior year in the calculation.
11. TOU estimate with less than 12 months' history. New customer with premises history.	
APS	Total monthly energy is estimated in the same manner as described in the response to Question 3. The TOU energy is calculated by allocating the total energy to the on- and off-peak period by the residential TOU average on- and off-peak energy percentages. The seasonal on-peak energy allocation percentages for the residential TOU rates are 40 percent and 30 percent for the summer and winter

	seasons, respectively. Non-residential TOU accounts are estimated by a billing representative using the customer's available history.
TEP	TEP would generate a manually estimated bill based on customer usage from the previous year using the following formula: LAST YEAR'S USAGE FOR SAME MONTH divided by NUMBER OF DAYS IN BILLING PERIOD=PER DAY USAGE PER DAY USAGE x NUMBER OF DAYS IN THIS MONTH'S CYCLE=ESTIMATED USAGE The CIS would generate a bill based on trend. Within TEP's CIS, a trend record is created from each billed service. This record becomes part of a trend table. During estimation, consumption from three prior bill cycles is compared to the consumption from the same cycle in the previous month to determine a trend. This trend, plus a tolerance, is used to create a usage amount for bill estimation. This would be done for on-peak and off-peak. If the estimation falls in a shoulder month then a manual estimation of shoulder would need to be done as CIS doesn't estimate shoulder usage. The manual estimation would use last month's or last year's allocation factor with this month's estimated total consumption. A circumstance for estimating TOU occurs when TEP is unable to obtain actual meter reads.
Summary of Other Arizona Utility Practices	Various methods including average of last three months, previous month, same month last year, or a combination of the above. Two utilities do not have TOU meters. Some will use customer-specific only information, not premises-specific information, and as a result, may not use same month prior year in the calculation.
12. TOU estimate. No history. New customer at new premises.	
APS	Total monthly energy is estimated in the same manner as described in the response to Question 4. The TOU energy is calculated by allocating the total energy to the on- and off-peak period by the residential TOU average on- and off-peak energy percentages. The seasonal on-peak energy allocation percentages for the residential TOU rates are 40 percent and 30 percent for the summer and winter seasons, respectively. On very rare occasions when a non-residential TOU account has missing reads, the billing representative issues a request for another visit to read the meter. If the new meter has failed so that a valid meter read still cannot be obtained on the second visit, a bill for zero usage is issued and a new meter installed. The zero usage bill will be estimated and rebilled by a billing representative by using the billing data from the subsequent months read.
TEP	A manual estimation would be done using new meter usage methodology. TEP would wait until it gets a good read on the new meter and use the following formula: NEW METER READ – BEGINNING READ TIMES METER CONSTANT divided by NUMBER OF DAYS = PER DAY USAGE. PER DAY USAGE x NUMBER OF DAYS IN PREVIOUS BILLING PERIOD = ESTIMATED USAGE. This would be done for each time period value. A circumstance for estimating TOU occurs when TEP is unable to

	obtain actual meter reads.
Summary of Other Arizona Utility Practices	Most do not estimate kWh usage and will only bill the service charge / minimum bill. Some will estimate using averages from similar customer groups.
13. Should you have procedures in place to respond to circumstances not listed above, please describe both the circumstances and applicable procedures for estimation.	
APS	APS does not have any circumstances for estimating bills for missing reads other than those listed above.
TEP	TEP has no procedures in place at this time.
Summary of Other Arizona Utility Practices	NA

C.2. EVALUATIVE CRITERIA: ARE COMMISSION RULES AND REGULATIONS REGARDING USAGE ESTIMATION, METER READING, AND BILLING PRACTICES CONSISTENT WITH THOSE OF OTHER STATE UTILITY REGULATORY AGENCIES?

3. ACC rules related to estimated billing are generally consistent with practices in other jurisdictions. Unfortunately, rules and regulations in other jurisdictions are generally silent on the issue of demand estimation practices.
    - Some state regulatory agencies require the electric utilities they regulate to actively attempt to obtain an actual meter reading following two consecutive estimated bills.
    - Some states require at least one bill per year be based on an actual read.
    - One state requires that the "estimating procedures employed by the utility and any substantive changes to those procedures be approved by the Commission."
    - States consistently allow the use of estimated bills in the event of severe weather, unsafe conditions, locked premises, emergencies, work stoppages, or other circumstances beyond the control of the utility.
        - For example, Nevada Power Company's Rules for Service define circumstances beyond the control of the utility to include:
            - Severe weather;
            - The presence of an animal on the premises of the customer which prevents an employee of the utility from reading the meter without risk of injury;
            - Any other circumstances which make it unreasonably difficult to read the meter.
    - Estimated bills are generally based on the customer's actual usage in prior periods.

- For example, Nevada Power Company's Rules for Service consider the following factors in calculating a bill based upon estimated usage:
  - The usage of the customer during the same month of the preceding year;
  - Any change in temperature from the preceding month;
  - The usage during the preceding month;
  - Seasonal load factors.[30]

- None of the states or utilities included in this analysis provided descriptions of the process for estimating residential customer demand.
- In at least one instance (Utah Power & Light Company), the measures the Company shall take to obtain an actual meter reading include scheduling a meter reading at other than normal business hours, making an appointment for meter reading, or providing a prepaid postal card for a customer to submit an actual meter reading.
- In most instances, providing access to the meter location is a condition of continued electric service.

4. ACC rules do not provide for the payment of interest for over-billing. At least one utility surveyed is required to provide interest on customer payments for over-billing.
   - Utah Power & Light Company, Electric Service Regulation No. 8, requires that interest be provided on customer payments for over-billing. Interest shall be paid from the date the customer overpayment is made, until the date when the overpayment is refunded. Over-billing is defined to include, among others, incorrect meter readings and incorrectly estimated demand billings.[31]
5. Information obtained in response to the Staff's November 26, 2004, letter to other state utility commissions indicates that Arizona rules related to meter reading and billing are generally consistent with rules in place in other states.
   - State utility regulatory agencies do not generally specify methodologies for bill estimation in their rules and regulations.
   - In most cases, the electric utilities under the jurisdiction of the states responding to the Staff's letter do not have residential demand tariffs.
   - State utility regulatory agencies have not undertaken studies or investigations regarding billing estimation and meter readings, nor ordered their utilities to conduct such studies.
   - Responses were received from (or discussions were held with) the following state utility regulatory agencies:
     - Public Utilities Commission of Nevada

[30] Nevada Power Company tariff No. 1-B, Rule No. 5, Bills for Service, A.5.

[31] Utah Power & Light Company, Electric Service Regulation No. 8, Original Sheet No. 8R.5.

- Idaho Public Utilities Commission
- Florida Public Service Commission
- Kentucky Public Service Commission
- California Public Utilities Commission
- Colorado Public Utilities Commission
- Missouri Public Service Commission
- New Hampshire Public Utilities Commission
- Washington Utilities and Transportation Commission

To the extent that additional responses are received, the results will be included in BWG's subsequent testimony.

Recommendation:

V-1. APS should take steps to obtain actual meter readings at customer premises that have persistent "no access" problems. The Company's established practice does not include the scheduling of a meter reading at other than normal business hours or making an appointment for a meter reading. [Refers to Finding V-2]

C.3. EVALUATIVE CRITERIA: ARE APS' USAGE ESTIMATION, METER READING, AND BILLING PRACTICES CONSISTENT WITH THOSE OF COMPARABLE ELECTRIC UTILITIES?

6. While the information available suggests that APS' usage estimation, meter reading, and billing practices are generally consistent with the practices of comparable electric utilities, several utilities use remote meter reading devices to obtain actual meter readings for premises with meter access problems.
   - There are insufficient numbers of electric utilities that have demand-billed residential customers to determine whether the use of class-average load factors to estimate demand is a generally accepted industry practice.
   - Responses from ten electric utilities located outside the state of Arizona indicate that estimating demand is generally not an accepted practice, but we believe the context of this response is primarily focused on large volume accounts, in which case their practices are consistent with APS' practices. None of these ten utilities use class average load factors to estimate demand.
   - Based on the information provided in response to Staff DR 8-6 regarding customer complaints escalated to the APS Consumer Advocates Office, APS used to install remote ports as a solution to some "no access" situations. We did not notice the Company offering to install remote ports at the Company's expense, however, after 1999.
   - Most companies indicated that the process to obtain an actual read starts after three consecutive estimates, and can eventually lead to disconnection at the pole.

Several companies also mentioned the installation of remote meter reading devices as an option.

- Other companies do not routinely estimate kWh based on actual temperatures during the period being estimated ("degree-days" are the commonly used metric to measure changes in temperature compared to normal) to estimate kWh, similar to APS.
- None of the companies contacted indicated that they used "six month seasonal," customer-specific information to estimate kWh usage similar to APS other than seasonal considerations recognized through the use of "same month, last year" billing data.

7. BWG has identified four methods to estimate demand for residential and small commercial customers and further analysis is required to determine the best process.
   - The four estimating methods are:
     - Historical customer-specific demand
     - Historical customer-specific usage and load factor
     - Historical customer-specific usage and class average load factor
     - Historical customer-specific usage and seasonally-adjusted, class-average load factors
   - BWG will complete further analysis to determine which of these methods most closely estimates actual demand for individual residential and small commercial customers and provide its recommendation in subsequent testimony.

Recommendation:

V-2 APS should continue to participate in benchmarking studies that compare its practices to other utilities in the industry. APS should provide such benchmarking analysis to Staff on a quarterly basis. [Refers to Finding V-6]

CHAPTER VI

Avis Read Complaint

In this chapter, we present our findings and recommendations related to the allegations contained in the Avis Read Complaint.

A. BACKGROUND

On June 4, 2002, a class action complaint was filed in the Superior Court of the State of Arizona by Avis Read against APS ("Read Complaint"). The complaint alleged that APS systematically failed to follow required practices and procedures regarding meter reading, estimation, and billing and that the Company harmed its customers by doing so.

On August 19, 2004, a ruling was issued by the Superior Court regarding the Avis Read complaint. The ruling found that Avis Read's claims "fall within the Commission's areas of primary jurisdiction" and that the Commission should decide the matter. Thus, on September 9, 2004, Avis Read filed a formal complaint at the Commission regarding APS' "improper estimation and billing procedures on demand meters." The Complaint alleges "that APS has systematically deceived and overcharged Complainant and the class in the sale of electricity to them, by systematically failing to follow legally required procedures regarding estimated charges for electricity sales; by billing estimated demand readings as if they were actual readings of demand for the month being billed; and by charging the class of electricity using estimating procedures not approved by the Arizona Corporation Commission as required by law, but arbitrarily invented by APS employees."

Ms. Read occupied two premises from September 1998 through September 2000, the time period that is the subject of this complaint: the Phoenix premises (Meter No. 906893), which Ms. Read occupied from September 1998 through July 1999 and the Paradise Valley premises (Meter No. A93326), which Ms. Read occupied from March 1999 through September 2000. The Phoenix account was a demand billed account, while the Paradise Valley account was non-demand billed.

APS did not access Ms. Read's meter at the Paradise Valley premises from June 1999 through February 2000, resulting in the issuance of estimated bills. This problem was compounded by the problems with APS' CIS which resulted in the estimated bills never being issued and mailed to Ms. Read during the period from September 1999 through January 2000. A total of 663 customers were affected by this CIS problem, some for as many as six months although approximately one-half were for only one month.[32] Ms. Read had similar problems with her Phoenix account. Due to problems associated with the new-CIS, APS did not mail Ms. Read her December 1998 and January 1999 bills on this account.[33]

[32] Based on response to Staff DR 3-19.

[33] Based on APS's Response to Complaint in Docket No. E-01345A-04-0657 on September 20, 2004.

B. WORK TASKS

BWG reviewed the specific allegations contained in the Avis Read Complaint and designed review procedures to determine the factual bases for these allegations. The work tasks included reviewing customer-specific information for Avis Read, Paul and Linda Schaeffer, and thirty-five customers who had filed informal complaints with the Commission. We also visited the Paradise Valley premises formerly occupied by Ms. Read to observe the actual conditions that created difficulties for the APS meter readers to obtain access to Ms. Read's meter when she resided at the premises.

C. FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

C.1. EVALUATIVE CRITERIA: ARE THE ALLEGATIONS IN THE AVIS READ COMPLAINT SUPPORTED BY THE FACTS OF THE CASE?

1. Contrary to the allegations contained in the Read Complaint, the main problem with the estimated bills issued to Ms. Read, primarily at her residence in Paradise Valley, were that the estimates were too low rather than too high.

   - On the three occasions in which actual reads were used as the basis for billings, these reads resulted in large amounts owed for previously underestimated monthly bills. When customers such as Ms. Read are faced with a large bill as a result of the true-up of previous months' estimated bills, the bill may present a financial hardship and it reduces the likelihood that the customer, without the correct pricing signal, would have taken measures to reduce usage on a timely basis.
   - On September 20, 2004, APS filed its Response to the Avis Read Complaint in Docket No. E-01345A-04-0657. **Table VI-1** and **Table VI-2** present the analyses of the Avis Read accounts in Paradise Valley and in Phoenix as included in Exhibits E and F of the September 20, 2004 filing.

Table VI-1
Meter A93326, Paradise Valley, AZ Account

Billing Period	Days in Billing Cycle	Energy Use (kWh)	Actual Meter Dial Read	Meter Read Date
3/3/99-3/19/99	16	602	96,665	3/19/99
3/19/99-4/21/99	33	1788	98,453	4/21/99
4/21/99-5/20/99	29	3042	1,495	5/20/99
5/20/99-6/21/99	32	3493	NA	Estimated
6/21/99-7/21/99	30	3225	NA	Estimated
7/21/99-8/18/99	28	2711	NA	Estimated
8/18/99-9/17/99	30	2406	NA	Estimated
9/17/99-10/18/99	31	3492	NA	Estimated
10/18/99-11/17/99	30	2901	NA	Estimated
11/17/99-12/17/99	30	2900	NA	Estimated
12/17/99-1/19/00	33	3191	NA	Estimated
1/19/00-2/17/00	29	2013	NA	Estimated
3/02/00			37,674	Ms. Read called in meter read to the Company
2/17/00-3/21/00	33	1242	NA	Estimated
3/21/00-4/18/00	28	1788	NA	Estimated
4/18/00-5/18/00	30	3042	NA	Estimated
5/18/00-6/19/00	32	3493	NA	Estimated
6/19/00-7/19/00	30	12707	57,429	7/19/00
7/19/00-8/18/00	30	2904	NA	Estimated
8/18/00-9/18/00	31	9855	70,188	9/18/00

- APS did not access Ms. Read's meter at the Paradise Valley premises from June 1999 through February 2000. According to APS, its meter readers attempted to obtain meter readings during this time period[34] but could not due to a locked gate. This problem was compounded by problems with APS' CIS which resulted in the estimated bills never being issued and mailed to Ms. Read during the period from September 1999 through January 2000.
- In Chapter III, Meter Reading, we discuss our findings related to Company meter reading practices. In our opinion, APS practices related to establishing meter reader routes and ensuring that sufficient meter reading resources are

[34] Based on response to Staff DR 1-33, APS05331 Page 3.

available to read all meters assigned to these meter reading routes has not contributed to the "no access" problems experienced by Ms. Read.

- On February 24, 2000, APS finally mailed bills to Ms. Read for electric services provided to her Paradise Valley residence during the period from September 1999 through January 2000. These bills totaled $1,709.42. This represented estimated usage for the period from August 18, 1999 through February 17, 2000. Compounding the problem was an amount owed from the bill issued on August 23, 1999 of $4,627.04, bringing the total amount due to $6,336.46. Ms. Read was unaware that these amounts were owed because of APS' billing system problems and, as a result, had not remitted payments for amounts owed.

- This large bill prompted Ms. Read to call APS on March 2, 2000, and provide the Company with a meter reading. APS then reissued the prior three months bills representing a total of 7,330 kWh using the actual meter reading reported by Ms. Read on March 2, 2000.

- As a result, the estimated kWh in CIS for the period May 20, 1999 through November 17, 1999 was likely understated, and the adjusted kWh for the three months ended February 17, 2000 was likely overstated since the periods adjusted were winter season, not summer season months.

- When the bills were reissued, the following notice appeared on her bill.

IMPORTANT NOTICE

This month's energy usage was calculated based on a meter read obtained either before or after the meter read date shown on this bill.

- This notice does not explain why Ms. Read received a second set of bills and could easily create confusion as to which bills to pay and what amount was in fact owed.

- The July 19, 2000, scheduled actual meter reading also resulted in a large bill, but based on the bills rendered it does not appear that prior month kWh was prorated and rebilled.

- During a field visit to the former home of Ms. Avis Read in Paradise Valley, BWG noted that the electric meter was in the rear yard of the property, behind a chain link fence that was about 4.5 to five feet high. If approached from the front of the house, the electric meter is behind a five-foot wooden fence that is latched. Assuming this is not problematic to the neighbor, the meter can be read from the adjoining neighbor's property which is directly accessible by walking across an undeveloped lot. However, it is unclear to what extent the meter location may have been obscured by vegetation during 2000 and whether that would have prevented the meter from being read from the adjoining property. Alternatively, the rear yard could be accessed from the right-hand side of the

property that is fenced by an approximate four foot locked chain link fence and walking to the meter location. Ms. Read had offered to let the Company replace the lock on the gate with a Company lock. We have not been able to determine whether the Company took advantage of this opportunity to gain access.[35] The property owner informed us that the latched wooden gate at the front of the property did not hold a lock, that the tenant, Ms. Read was normally at home, was not incapacitated from opening the door, answered phone calls, and additionally had a caretaker at her home. According to APS, its meter readers attempted to obtain meter readings during this time period but could not due to a locked gate. BWG intends to interview the actual meter reader primarily responsible for reading Ms. Read's Paradise Valley meter and will include the results of this interview in subsequent testimony. However, in interviews with other APS meter readers, these meter readers had described that when they have a no access situation, they attempt to find another way to get in. Given the circumstances at this premises, it is not clear whether other access alternatives were properly considered. For example, the meter reader may have been able to cross the undeveloped lot next to the Avis Read backyard and read the meter from over the fence or the meter reader supervisor may have been able to have phoned or arranged to visit the Avis Read home and discuss obtaining an APS lock on either fence (wooden or chain link).

Table VI-2

Meter No. 906893, Phoenix, AZ Account

Billing Period	Days in Billing Cycle	Energy Use (kWh)	Demand (kW)	Meter Read Date	Bill Amount	Cost per Day
9/21/98-10/21/98	29	3633	9.9	10/21/98	$282.59	$9.74
10/21/98-11/20/98	30	2900	9.7	11/20/98	$195.26	$6.51
11/20/98-12/22/98	32	3602	9.5	12/22/98	$219.28	$6.85
12/22/98-1/22/99	31	3184	8.6	1/22/99	$197.07	$6.35
1/22/99-2/19/99	28	2860	8.7	Estimated	$186.02	$6.64
2/19/99-3/19/99	28	3577	11.9	3/19/99	$238.28	$8.51
3/19/99-4/21/99	33	3356	10.2	Estimated	$216.37	$6.55
4/21/99-	29	3622	11.0	Estimated	$295.10	$10.17

[35] Based on response to DR 1-46, APS00231, CIS Site notes.

Billing Period	Days in Billing Cycle	Energy Use (kWh)	Demand (kW)	Meter Read Date	Bill Amount	Cost per Day
5/20/99						
5/20/99-6/21/99	32	4148	12.0	Estimated	$329.63	$10.30
6/21/99-7/8/99	15	4416	23.6	7/8/99	$333.91	$22.26

- The primary problem associated with estimating kWh on the Avis Read accounts is that the estimates were consistently too low. For Ms. Read's account in Paradise Valley, on each of the three occasions during the period from May 1999 through September 2000 when actual meter readings were obtained, large adjustments were required to previously estimated usage to true-up the amounts billed to the actual kWh used. APS did not prorate kWh for the entire estimated period. As a result, the kWh recorded in CIS for the unadjusted months would continue to be understated and continue to result in underestimated bills to the extent used to estimate consumption in subsequent periods.
- Following the actual meter reading in March 2000, the BSR working Ms. Read's account could have coded the account as "Do Not Estimate" so the account would have a billing exception the next time it was estimated, and the proper consideration given to the underestimation of kWh given CIS's routine kWh estimation algorithms.
- On April 7, 2000, following the large adjustment based on an actual meter reading telephoned in by Ms. Read on March 2, 2000, the 86 year old Ms. Read wrote a letter to APS stating:

> *I am in dire need of your assistance on a matter of an APS bill, and hope that you will come to my aid to resolve the problem...I have received numerous bills from APS with separate accounts, one for [Paradise Valley] and one for my former residence. It has escalated to over $7,000, and now I am being harassed and threatened with collection and credit problems, which I have never had in the very long time I have been a customer of APS – since the early fifties...I have explained the problem at great length to various supervisors and troubleshooters at APS, to no avail....*[36].

- On September 26, 2000, Ms. Read called APS to discuss bills related to her Paradise Valley account. Ms. Read was advised by the customer solution center representative that she should "have air conditioning checked if going to continue using and other major appliances – extremely high usage."[37] This followed a call on September 5, 2000 at which time Ms. Read questioned her estimated bill, believing that it was too high. Ms. Read was advised that "once

[36] Based on response to Staff DR 1-46, APS00532.

[37] Based on response to Staff DR 1-46, APS00232, CIS Site Notes for Avis Read account, Paradise Valley

meter is read the bill will adjust and possibly credit the account."[38] Thus, Ms. Read was unprepared for another large adjustment. Furthermore, without the usage and billing information that may have enabled her to make lifestyle or other changes, she did not have a reason to reduce her energy usage. The APS Customer Solution Center did not provide Ms. Read with a solution to her problem.

- If APS used its auto-dialer to alert consistent "no access" customers of the scheduling of their next meter reading, customers such as Ms. Read would more likely have arranged access on the day the meter was scheduled to be read.
- APS provided escalated customer complaints and the Company's response to those complaints in response to Staff DR 8-6. BWG noticed several additional instances in which customers complained of high bills following several consecutive months of estimated bills. In each of these instances, APS offered these customers extended payment plans.

2. During the period from September 1999 through January 2000, APS did not mail bills to a total of 663 customers, including Ms. Read, because of CIS problem. Some customers did not receive bills for as many as six months although approximately one-half were for only one month.[39] APS is required to issue monthly bills to its customers. As a result of this CIS problem, APS violated Commission rules and regulations.
3. The two sets of bills rendered to Ms. Read for the period from December 17, 1999 through February 17, 2000 represent standard bill/re-bill practices for the adjustment of estimated bills, but the bill notices do not clearly communicate the purpose of the reissued bills.
    - The Read Complaint alleges that Ms. Read received two sets of bills for the billing periods December 17, 1999 through February 17, 2000, for Meter No. A93326, one set of which indicated that her meter was read, and the other indicating that her meter was estimated. The second set of bills sent to Ms. Read resulted from the actual meter reading provided by Ms. Read to APS and the subsequent rebilling of three months previously estimated.
    - BWG reviewed both sets of bills for this time period. The language on the reissued bills does not clearly explain the reason for the new bills covering kWh during a time period previously billed.
    - The customer bill contains instructions and a telephone number regarding who a customer should call in the event they have questions about the bill.
4. The problems associated with Ms. Read's two accounts as described above and the poor customer service provided by APS to Ms. Read are disturbing. APS should not have a) allowed Ms. Read to not have received bills for utility service for the period from September 1999 through January 2000, b) allowed the number of consecutive

[38] Based on response to Staff DR 1-46, APS00231, CIS Site Notes for Avis Read account, Paradise Valley

[39] Based on response to Staff DR 3-19.

estimated bills to be rendered without making arrangements to obtain access to the meter, and c) continued to render bills based on underestimated consumption once the actual meter reading was obtained. In addition, APS should have been more responsive to Ms. Read's concerns over her high energy consumption and to the financial hardships created as a result of the bills not issued and the high true-up bill once the actual meter reading was obtained.

5. While APS claimed that its demand estimating practices implemented in March 1999, which included the use of class-average load factors rather than customer-specific load factors, would result in the underestimation of demand on average, the Company has not properly considered the impact of this change on individual customers.
   - APS does not appear to have identified the extent by which individual customer load factors differ from class average load factors and the impact this may have on individual customers when estimating demand. As a result, the use of class average load factors rather than customer specific load factors may not be in the public interest.
   - Further analysis is required to determine the extent to which individual customers have been harmed through the use of a class average load factor rather than customer specific load factors.
   - While APS did not obtain Commission approval before making the change to the use of class average load factors in early 1999, APS applied a generosity factor to the class average load factor. APS claimed that the intended purpose of adjusting the class average load factor was to provide assurance that customers, on average, would not be harmed. Several internal APS e-mails included comments recognizing the importance of having a demand estimation practice that would withstand Commission scrutiny, and believing that APS had such a practice in place.
6. From September 1998 through September 2003, APS did not have a systematic method for identifying all accounts where the estimated demand proved to be higher than the actual demand reading obtained.
   - APS made the conscious decision not to retroactively identify and credit those customers who were over-billed demand.
   - APS stated that adopting the policy to automatically credit customer accounts for the overestimation of demand exacerbates the underestimation problem.
   - According to the Company, its policy was to credit a customer's account for demand overestimation when discovered through other processes or when questioned by a customer.
   - Some of the demand overestimations would have been identified through the working of other billing exceptions or through calls from customers.
7. Paul and Linda Schaeffer, who were also parties to the amended complaint, received eleven estimated bills from the time they became customers of APS in April 2002 through February 2003 when they moved.

- During the eleven-month period from April 2002 through February 2003, they received ten estimated bills. Four of the estimates were due to an unsafe condition (dog) and six were due to a locked gate ("no access").[40] There were repeated efforts by both parties to resolve the unsafe conditions and "no access" problems.
- APS sent the customer bill notices in all eleven months and these bill notices identified the bill as "estimated" and also provided the reason for the estimate.
- Starting with the third consecutive month in which bills were estimated, the Company also began to use the auto-dialer (five months) and send blue cards (two instances) to notify the Schaeffers that access to their meter was required. They also provided the Schaeffers with several copies of the Company's meter reading schedule.
- On several occasions the Schaeffers contacted the Company directly to discuss the "no access" situation.
- Six of the estimated bills were CIS-generated and five were manually-generated by the Billing Services Department.
- In August 2002, the customer was switched from a time-of-use (TOU) rate to a standard rate. APS continued to be unable to secure a Company-read meter read during the two months the customer was on the standard rate. BWG has not visited the Schaeffer premises to determine whether the Company should have been able to read the meter without gaining direct access to the meter – one of the presumed benefits for switching rate plans. However, the customer did provide access in October 2002 at which time the time-of-use rate was restored.
- The standard rate bill issued on August 16, 2002 was replaced with a corrected, standard rate bill on August 23, 2002, which in turn was replaced with a TOU rate bill on August 29, 2002. The August bill was based on a customer provided meter reading, but was considered an estimated bill since the read date was outside the 25/35 day window and had to be prorated by the Company.
- The customers contacted the Company following the receipt of an estimated bill indicating the reason for the estimate was a "locked gate." They stated that the gate was not locked but simply latched from the inside. Rather than agree to reach over the gate to unlatch it from the inside, the Company requested the Schaeffers move the latch to the outside.
- The Schaeffers were not on a demand rate, so there are no issues related to estimating demand associated with their account.

8. BWG will expand the analyses and review the load research data to identify the degree to which load factors for specific customers vary from the class average load factor. The use of a class average load factor, while potentially unbiased, may result in individual customers being significantly over or undercharged for demand. The result of this review and analysis will be included in subsequent testimony.

[40] Based on information provided by APS in response to Staff DR 1-39.

Recommendations:

VI-1. APS should be required to train BSRs and others involved in the usage estimation, meter reading and billing process to understand that customers value an accurate bill more than an underestimated bill. APS should also train its personnel to recognize situations in which the underestimation of usage may result in problems for their customers. APS should provide Staff with a description of the changes to its training process within six months of a decision in this matter. [Refers to Finding VI-1]

VI-2. APS should be required to provide a clearer notice on a re-billed account. The notice should clearly state that the new bill replaces the previously issued bill and that the customer should only pay the reissued bill amount. APS should consult with Staff in determining the appropriate language and placement on the bill within 30 days of a decision in this matter. In addition, APS should be required to make the appropriate modifications to its billing system to implement this change within sixty days of a decision in this matter. [Refers to Finding VI-2]

See Chapters III and V for recommendations related additional steps that should be taken to reduce the number of "no access" meters.

C.2. EVALUATIVE CRITERIA: DOES THE REVIEW OF THE USAGE ESTIMATION, METER READING, AND BILLING ACTIVITIES ASSOCIATED WITH THE THIRTY-FIVE CUSTOMERS WHO FILED INFORMAL COMPLAINTS SUPPORT READ'S ALLEGATIONS?

9. The thirty-five (35) customers who have filed informal complaints with the Commission received a total of 232 estimated bills covering the period from August 1995 through October 2004. Although each estimated bill reviewed was identified as such on the customer bill, not all estimated bills had the reason for the estimate stated on the bill, although this practice improved over time. It appears that the action taken by APS was consistent with the Company's stated practices in response to the consecutive estimated bills, although records did not exist in all instances,[41] and that these practices have improved over time. However, these practices are not sufficient to ensure that "no access" problems are resolved, or actual meter readings obtained, in a timely manner.

    - The number of estimated bills received by these customers ranged from zero for one customer to thirty (30) for another customer. The median is four estimated bills; the mean is 6.6 estimated bills.
    - The customer receiving thirty (30) estimated bills had one streak of four consecutive reads and one streak of three consecutive reads. The primary stated reason for "no access" was a locked gate. The customer received 15 bill

[41] Based on information provided by APS in response to Staff DR 2-1.

notices, five door hangers, four auto-dialer calls, and was sent the annual meter reading schedule two times.

- Another customer received 25 estimated bills, with one streak of eleven (11) consecutive months and another streak of five consecutive months. The stated reason for the "no access" situation was a blocked meter. This customer received 21 bill notices, five no access letters, five "blue cards," and five auto-dialer calls.
- Another customer received 18 estimated bills, including two streaks of three consecutive reads. The primary stated reason for the "no access" situation was a locked gate. This customer received 17 bill notices, one "no access" letter, one "blue card," and two auto-dialer calls.
- Another customer received eight estimated bills, all in consecutive months. The customer's meter was reported to have been changed two times during this period. This customer received eight bill notices, two auto-dialer calls, and one policy allowance of $50 – the only policy allowance given to this group of customers during this period.
- The Company was unable to provide copies of bills rendered earlier than mid-1999, so BWG could not verify whether the reason for the estimate was shown on those bills. For subsequent periods, it is clear that the inclusion of reasons for estimating bills became a more common practice over time.
- Only one of the customers had enough consecutive months (based on the Company's policies) to warrant changing the meter to the standard rate or disconnecting the customer's electric service. This did not occur.
- A complete summary of the billing history for the 35 customers (names redacted) is provided in **Appendix D** to this report.

APPENDIX A

Appendix A – TIMELINE of Key Events at APS Related to Meter Reading and Billing Processes

Following is a timeline of key events that have occurred at APS related to the meter reading and billing process. These key events, and the impact of these events on APS's usage estimation, meter reading and billing processes will be discussed in more detail in the appropriate sections of the report that follow. The timeline is presented here to provide a perspective of these events and the timeframe in which they have occurred.

Time Period	Events
1-6-1987	System Description of the Customer Information System (CIS)[1] included formulas or calculations or definitions for: • Formula for load factor that included the use of individual customer data; • Calculation of estimated demand; and • Definition of high/low validation checks.
2-18-1995	Metro Phoenix Area adopted new "no access" procedure for residential customers in metropolitan Phoenix area. "No access" accounts are those for which no meter reading could be obtained due to reasons such as a locked gate, dangerous animal and vegetation.
2-1996	The APS Vice President of Customer Services requested a Meter Reading Operational Review.
4-4-1996	Pinnacle West/APS Internal & Systems Audit Department issued Meter Reading Operational Audit as requested by the APS Vice President of Customer Services. The audit report recommended notifying customers when APS was unable to reset their demand meter or when any portion of their meter reads was estimated. The report recommended that the new CIS system should be designed to print "estimated" next to the portion of the reads that are estimated.
9-3-1996	APS Meter Reading/Billing Task Force issued report.
12-10-1996	Detailed Order Docket no. U-1345-96-162 (Ciccone v. Arizona Public Service Co.) references the estimating procedure used by old CIS.

[1] The term "Old CIS" refers to the Customer Information System that was operational prior to September 14, 1998. The term "New CIS" refers to the CIS that was implemented as of September 14, 1998.

Time Period	Events
Since 1998	APS embarked on a number of improvement initiatives for Billing Services and Meter Reading: • Developed electronic work queue, AT Hudson Productivity Review, Billing Services Webpage, online rebilling statements, employee statistics tracking, "Billing Rep Direct" online billing procedures, web interface for customer documentation fulfillment, Quality Control function, and queries to assist daily work. • PACE meter reading Benchmarking study, implemented DB Microware routing software, AT Hudson meter reading review, Coffelt Housing Project ERT pilot, Itron P4, Safety committee, second AMR pilot, Cost per Meter read analysis, updated meter reading training, developed queries for meter reading.
9-14-1998	Various methods used by billing consultants and associates to estimate demands.
9-14-1998	APS implemented new CIS system.
9-14-1998	According to the 4/23/2003 deposition of an APS computer programmer, when APS got the new CIS system, CIS did not include programming to automatically estimate demand.
9-14-1998 to 3-9-1999	It appears that during this time period, APS billing service representatives (BSRs) had manually calculated estimated demand.
1998 or 1999	Pricing Department was requested to provide better guidelines to Information Services for system estimating. Pricing Department decided to use class average load factor based on load research survey data.
3-9-1999	CIS was programmed to calculate an estimated demand using class average load factors: • 45% for EC-1 rate customers, • 50% for ECT-1R customers • 60% for non-residential customers with a C or G meter type. An APS computer programmer performed the programming based on load factors provided by a rate consultant in the APS Pricing Department. The programmer estimated that the change required about 24 hours of programming. These class average load factors included what APS has referred to as a "10% generosity factor".
1999	According to the deposition of the Manager, Regulatory Affairs, no one ever asked her to submit the change in residential class average load factor to the Commission.
7-14-1999	According to an e-mail, the Manager, APS Consumer Advocate's Office, was concerned that "estimate" was not printing on the bills and that the fix should be expedited.

Time Period	Events
8-1999 – 2-2000	The time period during which Avis Read's energy bills were estimated by APS.
3-2-2000	APS received actual meter reading from Avis Read
5-18-2000	Rules for High Exceptions for Billing Exceptions 181-182 revised: 181 - Reference table for all service plans of non-residential accounts used "Highest Usage x 5"; 182- Reference table for all service plans, residential accounts and irregular accounts, used "Estimated usage x 10" as the usage limit.
8-10-2000	Emails document some discussions about irregular users. APS issued defect/enhancement regarding services experiencing no kW demand and incorrect system estimates.
8-14-2000	The date that CIS began issuing a billing exception upon the third consecutive estimate. Previously CIS issued the billing exception upon the fourth consecutive estimate.
10-06-2000	Effective date for the Billing Services Department policies and procedures regarding "Mailing Out Blue Cards" to notify the "no-access" customers that APS needed to read the meter.
11-17-2000	APS held meeting to discuss ACC Commitments of 1996.
11-30-2000	APS noted inconsistencies in the methods being used to estimate and prorate bills. The rate consultant proposed that when the BSRs manually calculated estimates, they should be using the same calculation for estimating demand that the CIS system used.
11-30-2000	An APS email documented that the meter reading managers agreed to begin more consistent "rotation" of reading assignments, every three to four months. The meter reading managers committed to work customer access reports on a regular basis.
11-2000	During November 2000, APS began testing an auto-dialer for "no access" accounts that had "no access" for three or more consecutive months.
12-4-2000	Sometime after this date, APS intended to use the 45 percent, 50 percent, 60 percent load factors that had been adjusted to include what APS referred to as a "generosity factor" in the Excel "Prorater" spreadsheet used by the billing service representatives.
11-2000	"No access" Call Campaign adopted.
11-21-2000	The Instructor Guide for the Customer Service Associate Training chapter regarding inquiry was revised.

Time Period	Events
12-28-2000	The Metro Phoenix area agreed to work the two daily reports received in meter reading more thoroughly.
Early 2001	Metro Phoenix activated auto-dialer for when an account reaches third consecutive month of "no access."
6-5-2001	The CIS change titled "Change 6133" of June 5, 2001 was revised to display customer accounts with greater than or equal to three consecutive estimated reads.
8-9-2001	An APS team issued the Billing Exception Review – Final Proposal which examined estimation procedures and evaluated billing exceptions to determine additions, revisions, or deletions needed.
8-9-2001	"Validation Parameters set too high" many bills which should have received a billing exception were going to the customers without review.
2-14-2002	APS makes a compliance filing in accordance with Decision 64180 in which it provides the number of initial and final bills that have been estimated and the Company's procedures for estimating initial and final bills.
3-12-2002	In an email, the APS Consumer Advocate's office expressed concerns about estimates created by APS, and expected that the ACC would be surprised at the volume of estimates.
4-16-2002	Billing date on Linda Schaeffer's first APS energy bill.
6-4-2002	Class action complaint filed by Avis Read.
6-19-2002	Change to CIS requested by a member of the APS Pricing Department. The change involved changing the class average residential TOU load factor from 50 percent to 35 percent.
6-29-2002	According to e-mails, APS detected that Billing Exception #116 – "No Estimate, Consecutive Reads, and Customer Read Exceeds Limit" needed to be changed to trigger on the third month of consecutive estimated reads rather than the fourth month of consecutive reads.
7-26-2002	According to an APS report, APS detected that CIS was issuing billing exception 116 on the fourth consecutive month of estimated reads instead of the third month. APS had detected that the CIS system was allowing accounts coded with an irregular use code to estimate more than three consecutive months without creating a billing exception. CIS was changed to fix this problem.

Time Period	Events
8-22-2002	Date on excerpt of BL/19 Estimating, High/Low checking rounding. At this time, CIS was performing high/low checking in the following ways: Low side is 50 percent of Current Usage Pattern System (CUPS), if able to calculate CUPS for this service account or 50 percent of usage for same month last year. High side is three times CUPS Estimate or three times previous highest usage.
8-24-2002	Date that the change in the value of the load factors became effective in CIS.
9-5-2002	A rate consultant circulated a draft of the APS Billing System Estimating Rules.
2-18-2002	An email from an APS rate consultant stated that the APS Pricing Department was asked to come up with something Information Services could quickly get into CIS for automatically calculating estimated demand.
2003	During 2003, the Billing Services Department implemented the Billing Estimater on the APS Intranet. This tool assisted the billing service representatives with estimating or pro-rating.
4-23-03	In a deposition for the Avis Read case, the Manager, Regulatory Compliance stated that she had not been asked to file anything with the Commission seeking approval of the estimating process. (APS04764)
6-2003	During June 2003, APS changed the "no access" policy to add steps for each estimated read. Under this new no-access policy, the meter reader must leave a door hanger at each premises where the meter reader was not able to access the meter to obtain a read. The policy indicates that the meter reader must leave a door hanger each month that the meter can not be read.
6-2003	Meter readers begin to leave door hangers to notify customers that they could not read the meter due to lack of access to the meter.
9-2003	Implemented Billing Exception 193 regarding estimated demand readings. Automatic billing exception identifies accounts when current kW obtained from actual read is less than estimated kW used last month.
2004	Options in Itron software changed for Metro Phoenix Meter Reading. Last month's read and last month's usage no longer appear on handheld device in Metro Phoenix area. (This change was not implemented outside of Metro Phoenix.)
8-2-2004	Second revision of "Methodologies for Estimating Customer Usage", (revised 08-02-2004) issued.

APPENDIX B

AEP TEXAS CENTRAL COMPANY &
SOUTHWESTERN ELECTRIC POWER COMPANY
Service Rules and Regulations Relating to Access Delivery System of Company by Competitive Retailers

4.7 Measurement and Metering of Service

4.7.2 Meter Reading

- Company is responsible for reading Company's meter. If an actual Meter Reading is not obtained, Company shall estimate the Meter Reading for invoicing purposes in accordance with this Chapter, the Rate Schedules in Section 6.1, RATE SCHEDULES, and Applicable Legal Authorities.

4.8.1.4 Estimated Usage

- Estimated usage must be identified as "Estimated" in the SET transactions. If requested, Company shall provide the reason for estimation and the estimation method used. If an estimation methodology is developed by the Commission, Company shall use that methodology.

ALABAMA PUBLIC SERVICE COMMISSION
GENERAL RULES
Rule 10
Meter Reading and Bill Forms – Electric, Gas, Steam, and Water Utilities

(D) From time to time, it will be necessary to estimate meter readings to avoid a long billing period. As nearly as practicable, utilities shall avoid rendering a customer two consecutive estimated bills. In cases where more than two successive estimated bills have been rendered, utilities shall notify the customers, stating the number of billing periods in which an estimated bill was rendered and reasons for the estimations. Bills rendered on the basis of estimated meter readings may be for reasons such as inclement weather, vicious animals, impassable roads, locked premises, or other causes beyond the reasonable control of the Utility. When a bill is estimated, this fact will be so indicated by a code or other designation on such bill.

AMERICAN ELECTRIC POWER Kentucky
SCHEDULE OF TARIFFS, TERMS AND CONDITIONS OF SERVICE GOVERNING SALE OF ELECTRICITY
P.S.C. Electric No. 7

14. Monitoring Usage

At least once annually the Company will monitor the usage of each customer according to the following procedure:

1. The customer's monthly usage will be compared with the usage of the corresponding period of the previous year.
2. If the monthly usage for the two periods are substantially the same or if any difference is known to be attributed to unique circumstances, such as unusual weather conditions, common to all customers, no further review will be made.
3. If the monthly usage is not substantially the same and cannot be attributed to a readily identified common cause, the Company will compare the customer's monthly usage records for the 12-month period with the monthly usage for the same months of the preceding year.
4. If the cause for the usage deviation cannot be determined from analysis of the customer's meter reading and billing records, the Company will contact the customer to determine whether there have been changes that explain the increased usage.
5. Where the deviation is not otherwise explained, the Company will test the customer's meter to determine whether it shows an average error greater than 2 percent fast or slow.
6. The Company will notify the customers of the investigation, its findings, and any refunds or backbilling in accordance with 807 KAR 5:006, Section 10(4) and (5).

APPLACHIAN POWER COMPANY
V.A.S.C.C. Tariff No. 18
Terms and Conditions of Standard Service
Sheet 3-6

If the customer has been incorrectly billed because of errors other than meter accuracy, the Company shall estimate the electricity used during the entire period of incorrect registration based on all known relevant facts, the billing will be calculated based on the estimated use of the electricity, and the customer shall pay to the Company such estimated amount.

ARKANSAS PUBLIC SERVICE COMMISSION
Part III. Rate Schedule No. 1

Monthly Bills

The Company makes a special effort to read all meters every month. Sometimes due to adverse weather conditions, dog hazards, damaged equipment, etc., it is not possible to obtain a meter reading and the bill may be estimated. Bill estimation is calculated based upon any one or combination of the following factors:

(1) history of use at the service location, (2) actual weather conditions during the billing period, (3) changes in electrical equipment used by the customer during periods under review, (4) usage of service locations of the same class and similar electrical service characteristics. Estimated bills are designated with an "E" on the bill under code "CD." Customers served under rates that have both gross and net rates will be billed both the gross and net amounts for electric service each month. Where bills are paid on or before the last due date, only the net bill will be paid. Where a bill is paid after the last due date, the gross bill will be paid.

PUBLIC UTILITIES COMMISSION OF THE STATE OF COLORADO
Rules Regulating the Service of Electric Utilities
4 Code of Colorado Regulations (CCR) 723-3

Nothing on meter reading or estimated bills.

INDIANA MICHIGAN POWER COMPANY
State of Indiana
I.U.R.C. No. 14, Second Revised Sheet No. 3
Terms and Conditions of Service

Bills for Electric Service

It may be necessary for the Company to render a bill on an estimated basis if extreme weather conditions, emergencies, work stoppage, or other circumstances of force majeure prevent actual meter readings. Any bill rendered on an estimated basis shall be clearly and conspicuously identified.

In the event of the stoppage of or the failure of any meter to register an accurate amount of energy consumed, the customer will be charged or credited for such period on an estimated consumption based upon his use of energy in a similar period of like use. The estimation shall include adjustments for changes in customer's load during the period the meter was not registering properly. All such billing errors will be adjusted to the known date of error or for a period of one year, whichever is shorter.

INDIANA MICHIGAN POWER COMPANY
State of Michigan
M.P.S.C. 13 – Electric
ORIGINAL SHEET NO. 3.63

Terms and Conditions of Standard Service

Estimated Billing Rule 12

1. A utility may estimate the bill of a residential customer every other billing month. A utility may estimate the bills more or less often upon a finding by the Commission that those procedures assure reasonable

billing accuracy. A bill that is rendered on an estimated basis shall be clearly and conspicuously identified as such. A utility shall not render an estimated bill unless the estimating procedures employed by the utility and any substantive changes to those procedures have been approved by the Commission.

2. A utility may render estimated bills to seasonally billed customers in accordance with the tariffs approved by the Commission.
3. Notwithstanding the provisions of sub rule (1) of this rule, a utility may estimate the bill of a customer if extreme weather conditions, emergencies, work stoppages, or other circumstances beyond the control of the utility prevent an actual meter reading.
4. If the utility is unable to gain access to read a meter, then the utility shall use reasonable alternative measures to obtain an actual reading, including mailing or leaving postage-paid, pre-addressed postcards upon which the customer may note the reading. If the customer fails to comply with those alternative measures or makes reading the meter unnecessarily difficult, then the utility may transmit an estimated bill notwithstanding the provisions of sub rule (1) of this rule. If a utility cannot obtain an actual reading under this sub rule, then the utility shall maintain records of the reasons and its efforts to secure an actual reading.

Customer Meter Reading – Rule 13

A utility shall provide each customer with the opportunity to read and report energy usage as long as the customer reports energy usage on a regular and accurate basis. A utility shall provide postage-paid, pre-addressed postcards for this purpose upon request. At least once every 12 months, a utility shall obtain an actual meter reading of energy usage to verify the accuracy of readings reported in this manner. Notwithstanding the provisions of this rule, a utility may read meters on a regular basis.

LOUISIANA PUBLIC SERVICE COMMISSION
GENERAL ORDER
In Re: Prohibition Against Estimating Utility Bills

This Commission is mindful that controversies have arisen between utility companies and consumers over the practice of some companies estimating utility bills, often resulting in billing for utility services not actually utilized or exceptionally high monthly bill when the meter is read and reconciled with the previous reading.

Accordingly, this Commission hereby orders that utilities utilizing meters shall not bill a customer for utility consumption except on the basis of actual meter readings. This order shall not be applicable to utilities whose member-customers provide the meter reading services. Exceptions may be granted in those cases when meters are read pursuant to mutual agreement between the utility and the customer or the monthly meter readings are not feasible.

NEVADA
CHAPTER 704 – REGULATION OF PUBLIC UTILITIES GENERALLY
NAC 704.337 Billing based upon estimated usage. (NRS 703.025, 704.210)

1. Except as otherwise provided in subsection 4, if a utility is unable, because of circumstances beyond its control, to read the meter of a customer on the date scheduled, it may bill the customer based upon his estimated usage for the billing period.
2. For the purpose of this section, circumstances beyond the control of a utility include:
    a) Severe weather;
    b) The presence of an animal on the premises of the customer which prevents an employee of the utility from reading the meter without risk of injury; or
    c) Any other circumstance which makes it unreasonably difficult to read the meter.
3. A utility shall consider the following factors in calculating a bill based upon estimated usage:
    a) The usage of the customer during the same month of the preceding year;
    b) Any change in temperature from the preceding month;
    c) The usage during the preceding month; and
    d) Seasonal load factors.
4. A utility which issues three consecutive bills to a customer based upon estimated usage, or five such bills for a customer in the area surrounding Lake Tahoe, shall notify the customer of its right of access to the premises of the customer. Thereafter, any additional and consecutive bill based upon estimated usage may be issued only under extraordinary circumstances.
5. A utility shall:
    a) Adjust the estimated usage upon the first reading of a meter after an estimated reading;
    b) Print the word "estimate" on each bill which is based upon estimated usage; and
    c) Notify customers of its right to issue bills based upon estimated usage. (Added to NAC by Public Service Comm'n, eff. 1-5-89)

NEVADA POWER COMPANY
Tariff No. 1-B, PUCN Sheet No. 60
Rule No. 5
Bills for Service

3. Except as otherwise provided in Section 6, if a utility is unable because of circumstances beyond its control, to read the meter of a customer on the

date scheduled it may bill the customer based upon his estimated usage for the billing period.

4. Circumstances beyond the control of the utility include:

   a. Severe weather;

   b. The presence of an animal on the premises of the customer which prevents an employee of the utility from reading the meter without risk of injury; or

   c. Any other circumstances which make it unreasonably difficult to read the meter.

5. A utility shall consider the following factors in calculating a bill based upon estimated usage:

   a. The usage of the customer during the same month of the preceding year;

   b. Any change in temperature from the preceding month;

   c. The usage during the preceding month; and

   d. Seasonal load factors.

6. A utility which issues three consecutive bills to a customer, based upon estimated usage, shall notify the customer of its right of access to the premises of the customer. Thereafter any additional and consecutive bill based upon estimated usage may be issued only under extraordinary circumstances.

F. Adjustments of Bills for Errors

   4. Bills for this purpose shall be based upon: a) Customer's prior use; b) Customer's subsequent use correctly metered; c) Utility's experience with other Customers of the same rate class, and d) the general characteristics of Customer's operations.

NORTHERN STATES POWER COMPANY
WISCONSIN ELECTRIC RATE BOOK, VOLUME NO. 7
SHEET NO. E 83
Rules and Regulations
Section 3.0 Rate Application and Billing Rules and Regulations

Section 3.3 Billing

Bills will normally be rendered monthly. Meters are scheduled to be read monthly at approximately 30-day intervals. If the Company is unable to read a meter, the customer's usage will be estimated by a computer programmed to take into account the

pattern of customer's use and seasonal factors. Bills rendered without an actual meter reading will specify that the usage is estimated. The Company may permit the customer to supply the meter readings, provided the Company reads the meter at least once each 6 months and when there is a change of customers.

PACIFIC GAS and ELECTRIC COMPANY
San Francisco, California
Cal. P.U.C. Sheet No. 14877-E
RULE 9 – RENDERING AND PAYMENT OF BILLS

C. ESTIMATED BILLS

If, because of unusual conditions or for reasons beyond the meter reading entity's control, the customer's meter cannot be read on the scheduled reading date, or if for any reason accurate usage data are not available, PG&E will bill the customer for estimated consumption during the billing period. Estimated consumption for this purpose will be calculated considering the customer's prior usage, PG&E's experience with other customers of the same class in that area, and the general characteristics of the customer's operations.

PSI ENERGY
IURC No. 13
General Terms & Conditions for Electric Service

12. Rendering and Payment of Bills

12.6 When Company is unable to obtain the reading of a meter and after reasonable effort, it may estimate the reading and render a bill, so marked.

12.7 In the event Company's meter fails to register properly for any reason, Company shall estimate Customer's energy use and/or maximum load during the period of failure based on such factors as Customer's normal load and energy usage during a like corresponding period.

PUBLIC SERVICE COMPANY OF OKLAHOMA
SCHEDULE: Facts About Your Electric Service Rules, Regulations and Conditions of Service - P. 4 of 13

9. ELECTRIC SERVICE BILLS

Meters furnished, installed and maintained by PSO are used to determine your monthly bills (except for unmetered contracts).

Meters are read and bills are submitted at monthly intervals. Whenever it is not possible to read your meter for a billing period, we may submit an estimated bill based on

previous usage and other available information. You will receive no more than two consecutive estimated bills without PSO reading your meter.

PUGET SOUND ENERGY
Electric Tariff G
Schedule 80
General Rules and Provisions

13. BILLING – The provisions of this Schedule are applicable, with the exceptions noted below, to all Customers served under rate schedules for electric service filed in this tariff.

a. Bi-Monthly Billing – The Company generally reads meters and issues billings to its customers on a bi-monthly basis. The following procedure is used in applying monthly rate schedules on a bi-monthly basis:

1. The rates per kWh in the monthly rate schedules remain in effect; the kWh blocks to which these rates apply are multiplied by two (2) for computing the bi-monthly kWh charges.
2. The rates for fixed KW Demand in the monthly rate schedules are multiplied by two (2) for computing the bi-monthly Demand charges.
3. The basic or minimum charges in the monthly rate schedules, whether fixed or based on maximum KW Demand or connected load, are multiplied by two (2) for computing the bi-monthly basic or minimum charges.

b. Other than Bi-Monthly Billing

1. Monthly Billing – Indicating and recording Demand meters used for billing purposes will be read and billings issued on a monthly basis. The Company may, at its option, read meters and issue billings on a monthly basis to certain customers who would customarily be billed on a bi-monthly basis under 13.a. above.

20. METERING

a. An accurate record shall be kept by the Company of all meter readings and such record shall be the basis for determination of all bills rendered for service. Should any meter fail to register correctly the amount of electricity used by the Customer, the amount of such use will be estimated by the Company from the best available information.

SAN DIEGO GAS & ELECTRIC COMPANY
Cal. P.U.C. Sheet No. 15695-E
RULE 9
Rendering and Payment of Bills

A. Rendering of Bills

5. If the utility is unable to read the customer's meter on the scheduled reading date, the utility may bill the customer for estimated consumption during the billing period, and make any necessary corrections when a reading is obtained. Estimated consumption for this purpose will be calculated considering the customer's prior usage, the utility's experience with other customers of the same class in that area, and the general characteristics of the customer's operations. Adjustments for any under-estimate or over-estimate of a customer's consumption will be reflected on the first regularly scheduled bill rendered and based on an actual reading following the period of inaccessibility.

SIERRA PACIFIC POWER COMPANY
Tariff No. Electric No. 1, 3rd Revised PSCN Sheet No. 22
Rule No. 5
Bills for Service

A. Rendering of Bills

2. Estimated Bills

a. If the utility is unable, because of circumstances beyond its control, to read the meter of a customer on the date scheduled, the utility may bill the customer based upon his estimated usage for the billing period.

Circumstances beyond the Utility's control include:

1. Severe weather
2. The presence of animal on the premises of the Customer which prevents an employee of the Utility from reading the meter without risk of injury.
3. Any other circumstance which makes it unreasonably difficult to read the meter including, but not limited to, remote service locations, difficult or no access to the meter, etc.

b. The following factors are considered in calculating a bill based upon estimated usage:

1. The usage of the Customer during the same month of the preceding year.
2. Any change in temperature from the preceding month.
3. The usage during the preceding month.
4. Seasonal load factors.

c. A Utility which issues three consecutive bills to a Customer based upon estimated usage, or five such bills for a customer in the areas that are prone to heavy snow or remote, shall either notify the Customer of its right of access to the premises of the Customer or of the specific circumstance which makes it unreasonably difficult to read the meter. Thereafter, any additional and consecutive bill based upon estimated usage may be issued only if the circumstances causing such estimated bill cannot be reasonably remedied.

d. The Utility shall adjust the estimated usage upon the first reading of a meter after an estimated reading. In cases where the meter's location or other circumstances make it unreasonably difficult to access, the Utility will read the meter at least once a year and correspondingly adjust the bill.

e. If, for reasons beyond its control, Utility is unable to read the Customer's meter on the scheduled reading date, the Utility may bill Customer the estimated consumption during the billing period, subject to adjustment at the time the meter is next read.

f. In circumstances where usage has been underestimated, the Utility will allow the Customer to pay off the under-estimate over a time period equivalent to the time period when the under-estimate occurred, if requested by the Customer.

SOUTHERN CALIFORNIA EDISON
Rosemead, California
Cal. PUC Sheet No. 29956-E
RULE 9
RENDERING AND PAYMENT OF BILLS

Nothing about meter reading or estimated billing.

SOUTHERN INDIANA GAS & ELECTRIC COMPANY
P.S.C.I. No. E-10 N.S.
General Terms and Conditions Applicable to Electric Service

9. Meter Reading and Billing

Bills will be rendered monthly based on metered or estimated usage. When the Company is unable to read the meter, the usage for the month will be estimated on the basis of past service records or other available data. Bills rendered for electric service in months in which meters are not read shall have the same force and effect as those based on actual readings. Any Customer who desires not to receive a bill for estimated usage may read his meter and send the readings to the Company on appropriate forms which will be provided by the Company upon request.

Should a meter fail to register the amount of electricity supplied during any period, the usage will be estimated based upon the use during similar periods or on other available information and a bill rendered accordingly.

PUBLIC UTILITY COMMISSION TEXAS

§25.25 Issuance and Format of Bills

d) Estimated Bills

1. An electric utility may submit estimated bills for good cause provided that an actual meter reading is taken no less than every third month. In months where the meter reader is unable to gain access to the premises to read the meter on regular meter reading trips, or in months when meters are not read, the electric utility must provide the customer with a postcard and request the customer to read the meter and return the card to the electric utility. If the postcard is not received by the electric utility in time for billing, the electric utility may estimate the meter reading and issue a bill.

2. If an electric utility has a program in which customers read their own meters and report their usage monthly, and no meter reading is submitted by a customer, the electric utility may estimate the customer's usage and issue a bill. However, the electric utility must read the meter if the customer does not submit readings for three consecutive months so that a corrected bill may be issued.

UTAH POWER & LIGHT COMPANY
P.S.C.U. No. 45
ELECTRIC SERVICE REGULATION NO. 8
STATE OF UTAH

BILLINGS

3. RESIDENTIAL ESTIMATED BILLING

Bills will be rendered regularly at monthly or bimonthly intervals to permanent continuous non-seasonal customers. The Company at its option may use an estimated billing procedure. If a meter reader is unable to gain access to a meter for the purpose of making an actual reading, the Company shall take appropriate additional measures in an effort to obtain an actual meter reading. These measures shall include, but are not limited to, scheduling of a meter reading at other than normal business hours, making an appointment for meter reading or providing a prepaid postal card with a notice of instruction upon which an account holder may record a meter reading. In addition, when mutually agreed upon and at the Customer's expense, a remote device may be installed. If after two regular route

visits access has not been achieved, the Company will notify the customer that he/she must make arrangements to have the meter read as a condition of continuing service.

If after complying with the above provisions, the Company is unable to make an actual meter reading within a two month period, it may again render an estimated bill for the current billing cycle.

OVERBILLING

a) Standards and Criteria for Overbilling

Billing under any of the following conditions constitutes overbilling.

1. a meter registering more than two percent fast, or a defective meter;
2. use of an incorrect watthour constant;
3. incorrect service classification, provided that the information supplied by the customer was not erroneous or deficient;
4. billing based on a switched meter condition where the customer is billed on the incorrect meter.
5. meter turnover, or billing for a complete revolution of a meter which did not occur;
6. a delay in refunding payment to a customer pursuant to rules providing for refunds for line extensions;
7. incorrect meter reading or recording by the Company; and
8. incorrectly estimated demand billings by the Company.

b) Interest Rate

1. The Company shall provide interest on customer payments for overbilling. The interest rate shall be the greater of the interest rate paid by the Company on customer deposits, or the interest rate charged by the Company for late payments.

2. Interest shall be paid from the date when the customer overpayment is made, until the date when the overpayment is refunded. Interest shall be compounded during the overpayment period.

WISCONSIN POWER & LIGHT COMPANY

Rules and Regulations Applicable to Electric, Gas, Water Service
Volume II, 2nd Revision, Sheet No. 46.00

Amendment 421, Schedule Xr-7

Billing When Unable to Read Meter

When the Company is unable to secure a meter reading after reasonable effort, the Customer will be billed on estimated consumptions and the difference adjusted when the meter is again read. The basis of such estimates shall be normal energy consumptions for similar periods in other years and normal consumptions of preceding months.

When an actual meter reading indicates that a previous estimated bill(s) were abnormally high or low, the bill may be re-calculated for the period(s) in which estimated bills occurred since the last actual reading. Consumption will be distributed over this period to reflect the normal usage pattern of the customer. The previous estimated charge(s) will be deducted from the re-calculated total. If there is evidence to indicate that actual use was not uniform throughout the period, the billing shall be adjusted according to available information.

APPENDIX C

AZ UTILITY RESPONSES TO STAFF'S FIRST SET OF DATA RESPONSES

STAFF 1-1 QUESTIONS

1. A kWh estimate with at least one year of history. Same customer at same premises or new customer with at least one year of premises history.

AJO Improvement Company	AJO Improvement Company (AIC) only estimates usage if a meter stops working or if AIC does not have access to the meter due to unforeseen circumstances, such as a locked gate. Estimates are typically done on a one-time basis due to unique circumstances and AIC does not have any customers where it estimates usage on a continuing basis.
Columbus Electric Cooperative, Inc.	(a) The CIS system would estimate the consumer's bill based on the three most recent month's avg. consumption. (b) If the consumers three most recent month's consumption were 512 kWh, 565 kWh & 595 kWh, the calculation would be: (512+565+595)/3+359 kWh. The CIS system does not estimate the kW demand for large commercial and industrial customer classes. It does however estimate kWh based on the same calculation. In cases where there is no demand reading, the Cooperative contacts the consumer and the billing demand is mutually agreed upon, based on history or data collection equipment is installed on the consumer business to determine kW demand. (c) The same would be true if this were a time-of-use consumer, the consumer's day and night consumptions would be calculated independent of each other in the manner previously described. (d) The kWh calculations are the same for both residential and non-residential accounts (e) This same procedure applies under any circumstance when a customer's bill is estimated. (f) Anytime a consumer has at least three months of history this procedure always applies. (g) CEC makes every effort to read all of the cooperative's meters every month, however there were cases in the past when residential meters were estimated due to locked gates, bad dogs, etc. In 2003 CEC began utilizing the ERTZ remote meter reading system, which allows our meter readers to retrieve reading from as far as a mile from their vehicles. With the exception of damaged or meter failure, this system has eliminated the need to estimate residential and small commercial meter readings. (h) The computer system never estimates the first month's kWh consumption. It would bill the system charge and associated taxes and not bill kWh until the following month. The final bill is never estimated because the meter is removed, a reading is taken and the meter is taken to the meter shop for testing and calibration.
Duncan Valley Electric Cooperative, Inc.	Average of: Same month, previous year; Previous month; Last three month average.
Garkane Energy Cooperative	An average of the last three months kWh used.
Graham County Electric Cooperative	kWh with at least 1 (one) year history: <1> same customer at same premises – use prior year's usage same month, calculate daily rate, apply to current days read for estimated kWh <2> new customer with at least 1 (one) year premises history – use history of premises usage same month, calculate daily rate, apply to current days read for estimated kWh.

AZ UTILITY RESPONSES TO STAFF'S FIRST SET OF DATA RESPONSES

STAFF 1-1 QUESTIONS

1. A kWh estimate with at least one year of history. Same customer at same premises or new customer with at least one year of premises history.

Mohave Electric Cooperative, Inc.	For same customer or new customer at same premises with at least one year of premises history, Mohave uses: a) last month's history; b) last three month's average usage; c) usage this month last year. Add results of a, b and c and divide by the number of answers obtained in a, b and c. This amount will be the estimated usage for this account. If the meter has stopped, the meter will be changed, and the estimated usage will be adjusted by taking actual usage on the new meter for seven days, and then applying the average daily usage times the number of days in the original billing period and then using eighty percent (80%) of this result as the adjusted estimated kWh usage.
Morenci Water & Electric Company	1a) Compare last month this year to last year last month and last year this month. 1b) Estimate = (this month last year) * (last month last year) / (last month this year). 1c) MW & E does not have time-of-use tariff
Navopache Electric Co-op	Navopache uses previous month history with same customer same premises. New customer no premises history is used and 0 kWh is billed, customer charge is pro-rated.
Sulphur Springs Valley Electric Cooperative	SSVEC uses previous month history & same month previous year with same and new customer at same premises.
Trico Electric Cooperative, Inc.	The CIS system calculates the estimate using the kWh, same month one year prior, from the same premises.
Tucson Electric Power Company	TEP would generate a bill based on customer usage from the previous year using the following formula: LAST YEAR'S USAGE FOR SAME MONTH DIVIDED BY NUMBER OF DAYS IN BILLING PERIOD = PER DAY USAGE. PER DAY USAGE X NUMBER OF DAYS IN THIS MONTH'S CYCLE = EST. USAGE. OR The CIS would generate a bill based on trend. Within TEP's CIS, a trend record is created from each billed service. This record becomes part of a trend table. During estimation, consumption from 3 prior bill cycles is compared to the consumption from the same cycle in the previous month to determine a trend. This trend, plus a tolerance, is used to create a usage amount for bill estimation. Circumstances for est. a meter read occur when TEP is unable to obtain an actual meter read.
UNS Electric, Inc.	The customer Information System ("CIS") would generate a bill based on customer usage from the previous year using the following formula: LAST YEAR'S USAGE FOR SAME MONTH divided by NUMBER OF DAYS IN BILLING PERIOD = PER DAY USAGE PER DAY USAGE x NUMBER OF DAYS IN THIS MONTH'S CYCLE = ESTIMATED USAGE Circumstances for estimating a meter read occur when UNS Electric, Inc. ("UNS Electric") is unable to obtain an actual meter read.

AZ UTILITY RESPONSES TO STAFF'S FIRST SET OF DATA RESPONSES

STAFF 1-1 QUESTIONS

2. A kWh estimate with less than 12 months' history. Same customer at same premises.

AJO Improvement Company	See response to (1) above.
Columbus Electric Cooperative, Inc.	(a) If the CIS system had more than three months history it would be estimated in the manner previously described. If there is no meter reading in the first month, residential and small commercial consumer accounts are not billed for kWh until the following month. They are only billed for the customer charge and applicable taxes. If the consumer has more than one month's history but less than three, then the consumer's kWh is estimated manually. (b) If the consumer has 45 days of consumption history and the next billing period averaged 30 days, the calculation would be: (765 kWh/45 days)*30 days=510kWh. kW demand is estimated in the manner described in the answer to the previous question. (c) The same would be true if this were a time-of-use consumer, the consumer's day and night consumptions would be calculated independent of each other in the manner previously described. (d) The kWh calculations are the same for both residential and non-residential accounts. (e) This same procedure applies under any circumstance when a consumer's bill is estimated. (f) Anytime a consumer has at least three months of history the CIS system estimates the bill and under circumstances where there are less than three months, bills are estimated manually. (g) CEC makes every effort to read all of the Cooperative's meters every month, however there were cases in the past when residential meters were estimated due to locked gates, bad dogs, etc. In 2003, CEC began utilizing the ERTZ remote meter reading system, which allows our meter readers to retrieve reading from as far as a mile from their vehicles. With the exception of damaged or meter failure, this system has eliminated the need to estimate meters. (h) As previously described, the first and final months bills are never estimated.
Duncan Valley Electric Cooperative, Inc.	Average of: Previous month usage; Last three month average.
Garkane Energy Cooperative	An average kWh usage of the last three months, of if less than three months history, then the last month's usage.
Graham County Electric Cooperative	kWh estimate with less than 12 (twelve) months' history same customer at same premises – use prior month's usage, calculate daily rate, apply to current days read for estimated kWh.
Mohave Electric Cooperative, Inc.	For same customer at same premises with less than one year of premises history, Mohave uses: a)last month's history; and b) last three month's average usage. Add results of a) and b) and divide by the number of answers obtained in a) and b). Last month's usage would be used if less than three months usage history is available. If the meter has stopped, the meter will be changed, and the estimated usage will be adjusted by taking actual usage on the new meter for seven days, and then applying the average daily usage times the number of days in the original billing period and then using eighty percent (80%) of this result as the adjusted estimated usage.

AZ UTILITY RESPONSES TO STAFF'S FIRST SET OF DATA RESPONSES

STAFF 1-1 QUESTIONS

2. A kWh estimate with less than 12 months' history. Same customer at same premises.

Morenci Water & Electric Company	2a) From the data available, up to 3 months usage, a daily average usage is calculated and multiplied by the number of days in the billing cycle. 2b) Estimate – (Sum of Monthly historical usage/number of history days) * number of days in billing cycle. 2c) MW & E does not have a time-of-use tariff.
Navopache Electric Co-op	Navopache uses previous month history.
Sulphur Springs Valley Electric Cooperative	SSVEC uses previous month history.
Trico Electric Cooperative, Inc.	The CIS system calculates the estimate using the average kWh of the past three months from the same premises.
Tucson Electric Power Company	If there is at least three months of data, the CIS would generate a bill based on trend. Within TEP's CIS, a trend record is created for each billed service. This record becomes part of a trend table. During estimation, consumption from three prior bill cycles is compared to the Consumption from the same cycle in the previous month to determine a trend. This trend, plus a tolerance, is used to create a high and a low value for meter read validation and a usage amount for bill estimation. If three months of data does not exist, CIS will use the rate schedule average daily usage to calculate customer's bill. If manually estimated, TEP would use the prior month's data and manually estimate consumption by using the following steps: (i) calculate per day usage, (ii) prior month consumption divided by number of days in cycle, and (iii) multiply number of days in the current month's cycle by per day usage. Circumstances for est. a meter read occur when TEP is unable to obtain an actual meter read.
UNS Electric, Inc.	If the bill was less than six days, the bill would be held over to the next billing month. If the bill was for six days or more, the CIS would generate a bill based on customer usage from the previous month using the following formula: LAST MONTH'S USAGE divided by NUMBER OF DAYS IN BILLING PERIOD = PER DAY USAGE. PER DAY USAGE X NUMBER OF DAYS IN THIS MONTH'S CYCLE = ESTIMATED USAGE.

AZ UTILITY RESPONSES TO STAFF'S FIRST SET OF DATA RESPONSES

STAFF 1-1 QUESTIONS

3. A kWh estimate with less than 12 months' history. New customer with premises history.

AJO Improvement Company	See response to (1) above.
Columbus Electric Cooperative, Inc.	(a) The CIC system would estimate the consumer's bill if there is at least three months history. If there is less than three months history, bills are estimated manually. Bills are never estimated based on the historical premises consumption. Electrical equipment and use patterns may differ significantly. (b) The bill calculations would be the same as answered in questions (1) & (2). (c) The same would be true if this were a time-of-use customer, the consumers day and night consumptions would be calculated independent of each other in the manners previously described. (d) The calculations are the same for both residential and non-residential accounts. (e) This same procedure applies under any circumstance when a consumer's bill is estimated. (f) Anytime a consumer has at least three months of history this procedure always applies. (g) CEC makes every effort to read all of the Cooperative's meters every month, however there were cases in the past when residential meters were estimated due to locked gates, bad dogs, etc. In 2003 CEC began utilizing the ERTZ remote meter reading system, which allows our meter readers to retrieve reading from as far as a mile from their vehicles. With the exception of damaged or meter failure, this system has eliminated the need to estimate meters. (h) first and final month's bills are never estimated.
Duncan Valley Electric Cooperative, Inc.	Use customer/premises history using average of: Same month, previous year; Previous month; Last three month average.
Garkane Energy Cooperative	An average kWh usage of the last three months, or if less than three months history, then the last month's usage.
Graham County Electric Cooperative	3. kWh estimate with less than 12 (twelve) months' history new customer with premises history – use prior month's premises usage, calculate daily rate, apply to current days read for estimated kWh.
Mohave Electric Cooperative, Inc.	For new customer at same premises with less than one year of premises history, Mohave uses: a) last month's history; and b) last three month's average usage. Add results of a) and b) and divide by the number of answers obtained in a) and b). Last month's would be used if less than three months usage history is available. If the meter has stopped, the meter will be changed, and the estimated usage will be adjusted by taking actual usage on the new meter for seven days, and then applying the average daily usage times the number of days in the original billing period and then using eighty percent (80%) of this result as the adjusted estimated usage.
Morenci Water & Electric Company	3a) From the premises data available, a daily average usage is calculated and multiplied by the number of days in the billing cycle. 3b) Estimate + (Sum of Monthly historical usage/number of history days) * number of days in billing cycle. 3c) MW & E does not have a time of use tariff.
Navopache Electric Co-op	New customer no premises history is used and 0 kWh is billed, customer is pro-rated.

AZ UTILITY RESPONSES TO STAFF'S FIRST SET OF DATA RESPONSES

STAFF 1-1 QUESTIONS

3. A kWh estimate with less than 12 months' history. New customer with premises history.

Sulphur Springs Valley Electric Cooperative	SSVEC uses previous month history.
Trico Electric Cooperative, Inc.	The CIS system calculated the estimate using the average kWh of the past three months from the same premises.
Tucson Electric Power Company	The CIS would generate a bill based on trend. Within TEP's CIS, a trend record is created from each billed service. This record becomes part of a trend table. During estimation, consumption from three prior bill cycles is compared to the consumption from the same cycle in the previous month to determine a trend. This trend, plus a tolerance, is used to create a usage amount for bill estimation. If manually estimated, TEP would use the prior month's consumption and use the following steps: (i) calculate per daily usage divided by number of days in cycle and (ii) multiply number of days in this month's cycle by per day usage. Circumstances for estimating a meter read occur when TEP is unable to obtain an actual meter read.
UNS Electric, Inc.	If the bill was for less than six days, the bill would be held over to the next bill cycle. If the bill was for six days or more, the CIS would generate a bill based on premises usage from the previous months using the following formula: LAST MONTH'S USAGE divided by NUMBER OF DAYS IN BILLING PERIOD = PER DAY USAGE. PER DAY USAGE x NUMBER OF DAYS IN THIS MONTH'S CYCLE = ESTIMATED USAGE.

AZ UTILITY RESPONSES TO STAFF'S FIRST SET OF DATA RESPONSES

STAFF 1-1 QUESTIONS

4. kWh estimate. No history.

AJO Improvement Company	See response to (1) above.
Columbus Electric Cooperative, Inc.	(a) This example would assume that this is the consumer's first month's billing. The Cooperative does not estimate the first month's kW billing. Residential and small commercial consumers would be billed only the customer charge and the applicable taxes. The Cooperative would at this point determine why the meter was unable to be read and take corrective action eliminating the likelihood of a second month's estimated bill. Large commercial and industrial accounts kW and kWh estimates are estimated in the manner previously described. (b) Because the Cooperative does not estimate the first month's bill there is no calculation. (c) The same would be true if this were a time-of-use customer. (d) The calculations are the same for both residential and non-residential accounts. (e) This same procedure always applies. (f) The CIS system estimates meter readings when a consumer has at least three months history, otherwise the estimates are made manually. (g) CEC makes every effort to read all of the Cooperative's meters every month, however there were cases in the past when residential meters were estimated due to locked gates, bad dogs, etc. In 2003 CEC began utilizing the ERTZ remote meter reading system, which allows our meter readers to retrieve reading from as far as a mile from their vehicles. With the exception of damaged or meter failure, this system has eliminated the need to estimate meters. (h) The Cooperative never estimates first or final bills.
Duncan Valley Electric Cooperative, Inc.	Average usage from similar class customer with similar premises, for same month.
Garkane Energy Cooperative	No estimation, customer would pay minimum bill.
Graham County Electric Cooperative	4. kWh with no history - use appropriate peak usage value or the average usage for the rate schedule.
Mohave Electric Cooperative, Inc.	With no history, Mohave will base estimated usage on actual usage for similar services similar customers for the same period. If the meter has stopped, the meter will be changed, and the estimated usage will be determined by taking actual usage on the new meter for seven days, and then applying the average daily usage times the number of days in the original billing period and then using eighty percent (80%) of this result as the adjusted estimated usage.
Morenci Water & Electric Company	4 a) Bill minimum service charge until a meter reading can be acquired, customer contacted by phone, door hanger to call office.
Navopache Electric Co-op	Navopache bills 0 kWh and prorates the customer charge.
Sulphur Springs Valley Electric Cooperative	SSVEC will attempt all possible means for read. If unable to secure "hard read" for "normal" billing cycle; SSVEC will move customer account to next billing cycle(s). If still unable to secure read, SSVEC will bill account as NO READ with Base Charge.
Trico Electric Cooperative, Inc.	If no history exists the CIS system will bill the fixed monthly charge only. The kWh will be billed with the next valid read.

AZ UTILITY RESPONSES TO STAFF'S FIRST SET OF DATA RESPONSES

STAFF 1-1 QUESTIONS

4. kWh estimate. No history.

Tucson Electric Power Company	The CIS will estimate based on a rate schedule average daily usage. A manual estimation would be done using new meter usage methodology. TEP would wait until it gets a good read on the new meter and use the following formula: NEW METER READ – BEGINNING READ x METER CONSTANT divided by NUMBER OF DAYS = PER DAY USAGE. PER DAY USAGE x NUMBER OF DAYS IN PREVIOUS BILLING PERIOD = ESTIMATED USAGE. Circumstances for estimating a meter read occur when TEP is unable to obtain an actual meter read.
UNS Electric, Inc.	If the bill was for less than six days, the bill would be held until the next billing cycle. If the bill was for six or more days, a service order would be issued and a manual estimation would be done, using new meter usage methodology. UNS Electric would wait until it gets a good read on the new meter and use the following formula: NEW METER READ – BEGINNING READ TIMES METER CONSTANT divided by NUMBER OF DAYS = PER DAY USAGE. PER DAY USAGE x NUMBER OF DAYS IN PREVIOUS BILLING PERIOD = ESTIMATED USAGE.

AZ UTILITY RESPONSES TO STAFF'S FIRST SET OF DATA RESPONSES

STAFF 1-1 QUESTIONS

5. A kW estimate with at least one year of history. Same customer at same premises or new customer with one year of premises history.

AJO Improvement Company	See response to (1) above.
Columbus Electric Cooperative, Inc.	This situation is applicable to large commercial and industrial consumers as they are the only consumers billed on a demand and energy rate. The CIS system does not estimate peak kW demand. In these cases the Cooperative contacts the consumer and the demand to be billed is mutually agreed upon based on seasonal history or from data collection equipment that may be installed for an agreed upon number of days to gather peak demand information during typical operating conditions. (b) There is no average calculation. (c) A time-of-use consumer is only billed for peak demand during on-peak hours; however, the previously stated approach for estimating peak billing demand would apply. (d) The calculations are the same for both residential and non-residential accounts; however, the situation is only applicable to non-residential accounts. (e) This same procedure applies under any circumstance when a consumer's bill is estimated. (f) These estimates are always performed manually. (g) CEC makes every effort to read all of the Cooperative's meters every month. With the exception of damaged or meter failure, this has eliminated the need to estimate meters. (h) First and final months billing would be handled in the same manner.
Duncan Valley Electric Cooperative, Inc.	Average of: Same month, previous year; Previous month; Last three month average.
Garkane Energy Cooperative	An average kW usage of the last three months.
Graham County Electric Cooperative	N/A
Mohave Electric Cooperative, Inc.	Mohave uses previous month's history with same customer or new customer at same premises with at least one year of history.
Morenci Water & Electric Company	MW & E does not have a tariff for demand.
Navopache Electric Co-op	Navopache uses previous month's history with same customer same premises. New customer no premises history is used and 0 kWh are billed. Large commercial and industrial accounts would also be billed 0 kWh if no customer internal data is useful and bill future adjustment based on actual new customer history.
Sulphur Springs Valley Electric Cooperative	SSVEC uses previous month and same month previous year with same and new customer and same premises.
Trico Electric Cooperative, Inc.	The CIS system calculates the estimate using the kW, same month one year prior, from the same premises.

AZ UTILITY RESPONSES TO STAFF'S FIRST SET OF DATA RESPONSES

STAFF 1-1 QUESTIONS

5. A kW estimate with at least one year of history. Same customer at same premises or new customer with one year of premises history.

Tucson Electric Power Company	The CIS doesn't estimate kW, therefore all situations are manually estimated. If consumption data is available the following formula is used: SAME MONTH LAST YEAR DEMAND divided by SAME MONTH LAST YEAR CONSUMPTION = LOAD FACTOR THIS MONTH'S CONSUMPTION x LOAD FACTOR=ESTIMATED DEMAND If consumption data is not available, TEP estimates consumption as described in the response to 1 a), then uses estimated consumption in the formula. If there is a new customer at the premises, all billing demand meters are also recording interval meters. TEP uses interval premises data to estimate. Circumstances for estimating a meter read occur when TEP is unable to obtain an actual meter read.
UNS Electric, Inc.	The CIS doesn't estimate kW, so all situations are manually estimated. If consumption data is available the following formula is used: SAME MONTH LAST YEAR DEMAND divided by SAME MONTH LAST YEAR CONSUMPTION = LOAD FACTOR. THIS MONTH'S CONSUMPTION x LOAD FACTOR = ESTIMATED DEMAND. If consumption data is not available, UNS Electric estimates consumption as described in the response to 1 a), then use estimated consumption in the formula. If there is only premises information then customer is billed on zero demand. Circumstances for estimating a meter read occur when UNS Electric is unable to obtain an actual meter read.

AZ UTILITY RESPONSES TO STAFF'S FIRST SET OF DATA RESPONSES

STAFF 1-1 QUESTIONS

6. kW estimate with less than 12 months' history. Same customer at same premises.

AJO Improvement Company	See response to (1) above.
Columbus Electric Cooperative, Inc.	The response to this question is the same as the response to question # 5.
Duncan Valley Electric Cooperative, Inc.	Average of: Previous month; Last three month average.
Garkane Energy Cooperative	An average kW usage of the last three months, or if less than three months history, then the last month's kW usage.
Graham County Electric Cooperative	N/A
Mohave Electric Cooperative, Inc.	Mohave uses previous month's history with same customer at same premises.
Morenci Water & Electric Company	MW & E does not have a tariff for demand.
Navopache Electric Co-op	Navopache uses previous month history with same customer same premises.
Sulphur Springs Valley Electric Cooperative	SSVEC uses previous month history with same customer same premises.
Trico Electric Cooperative, Inc.	The CIS system calculates the estimate using the average kW of the past three months from the same premises.
Tucson Electric Power Company	The CIS doesn't estimate kW, therefore all situations are manually estimated. If consumption data is available the following formula is used: LAST MONTH'S DEMAND divided by LAST MONTH'S CONSUMPTION=LOAD FACTOR THIS MONTH'S CONSUMPTION x LOAD FACTOR=ESTIMATED DEMAND If consumption data is not available, consumption is estimated as described in the response to 1 a) and then estimated consumption is used in the formula. Circumstances for estimating a meter read occur when TEP is unable to obtain an actual meter read.
UNS Electric, Inc.	The CIS doesn't estimate kW, therefore all situations are manually estimated. If consumption data is available, the following formula is used: LAST MONTH'S DEMAND divided by LAST MONTH'S CONSUMPTION = LOAD FACTOR. THIS MONTH'S CONSUMPTION x LOAD FACTOR = ESTIMATED DEMAND. If consumption data is not available, UNS Electric estimates consumption as described in the response to 1 a), then estimated consumption is used in the formula. Circumstances for estimating a meter read occur when UNS Electric is unable to obtain an actual meter read.

AZ UTILITY RESPONSES TO STAFF'S FIRST SET OF DATA RESPONSES

STAFF 1-1 QUESTIONS

7. kW estimate with less than 12 months' history. New customer with premises history.

AJO Improvement Company	See response to (1) above.
Columbus Electric Cooperative, Inc.	The response to this question is the same as question #5. The Cooperative does not estimate kW demand based on a previous owner's history.
Duncan Valley Electric Cooperative, Inc.	Use customer/premises history using average of: Same month, previous year; Previous month; Last three month average.
Garkane Energy Cooperative	An average kW usage of the last three months, or if less than three months history, then the last month's kW usage.
Graham County Electric Cooperative	N/A
Mohave Electric Cooperative, Inc.	Mohave uses previous month's history with new customer at same premises.
Morenci Water & Electric Company	MW & E does not have a tariff for demand.
Navopache Electric Co-op	New customer no premises is used and 0 kW are billed. Large commercial and industrial accounts would also be billed 0 kW if no customer internal data is useful and bill future adjustment based on actual new customer history.
Sulphur Springs Valley Electric Cooperative	SSVEC uses previous month history with new customer with premises history.
Trico Electric Cooperative, Inc.	The CIS system calculates the estimate using the average kW of the past three months from the same premises.
Tucson Electric Power Company	The CIS doesn't estimate kW, therefore all situations are manually estimated. If there is a new customer at premises, all billing demand meters are also recording interval meters. TEP uses interval premises data to estimate. If consumption data is available the following formula is used: LAST MONTH'S DEMAND divided by LAST MONTH'S CONSUMPTION=LOAD FACTOR THIS MONTH'S CONSUMPTION LOAD FACTOR=ESTIMATED DEMAND If consumption data is not available, TEP estimates consumption as in the response to 3 a), then uses estimated consumption in the formula. Circumstances for estimating a meter read occur when TEP is unable to obtain an actual meter read.
UNS Electric, Inc.	The CIS doesn't estimate kW, therefore all situations are manually estimated. If it is a new customer they are billed for zero kW. If consumption data is not available, UNS Electric estimates consumption as in the response to 3 a). Circumstances for estimating a meter read occur when UNS Electric is unable to obtain an actual meter read.

AZ UTILITY RESPONSES TO STAFF'S FIRST SET OF DATA RESPONSES

STAFF 1-1 QUESTIONS

8. kW estimate with no history.

AJO Improvement Company	See response to (1) above.
Columbus Electric Cooperative, Inc.	(a) This situation would be applicable only to the first month's billing. The Cooperative would make arrangements to install monitoring equipment on the consumer's premises to gather peak demand information during typical operating and seasonal conditions for a predetermined mutually agreed upon time frame. (b) There would be no averaging calculation under this circumstance. (c) The same would be true if this were a time-of-use consumer, the Cooperative would gather on-peak kW demand information. (d) The calculation are the same for both residential and non-residential accounts. (e) This same procedure applies when a large commercial or industrial consumer's first month kW demand requires estimation. (f) This procedure always applies to first month billings within these customer classes. (g) CEC makes every effort to read all the Cooperative's meter every month. With the exception of damaged or meter failure, this system has eliminated the need to estimate meters. (h) First and final month's bills are never estimated.
Duncan Valley Electric Cooperative, Inc.	Average usage from a similar class customer with similar premises, for same month. For customer with known horsepower, kW calculation is made. For customer with no similar premises or no known horsepower we would come to agreement with customer for an estimated bill.
Garkane Energy Cooperative	No estimation, customer would pay minimum bill.
Graham County Electric Cooperative	N/A
Mohave Electric Cooperative, Inc.	If data for similar customers is available and relevant, estimate is based on kW for similar customers for same billing period, and this estimated kW will be adjusted based on actual new customer history during the next billing period.
Morenci Water & Electric Company	MW & E does not have a tariff for demand.
Navopache Electric Co-op	0 kW is billed. Large commercial and industrial accounts would also be billed 0 kW if no customer internal data is useful and bill future adjustment based on actual new customer history.
Sulphur Springs Valley Electric Cooperative	Exhaust all means to secure hard read, move customer account to different billing cycle(s), bill NO READ with Base Charge.
Trico Electric Cooperative, Inc.	The CIS system does not estimate, a service order is issued for a meter technician to extract valid read.
Tucson Electric Power Company	The CIS doesn't estimate kW, therefore all situations are manually estimated. The estimate is done by using like-customer data. TEP calculates like-customers load factors, then multiplies the current month consumption by load factor to get the estimated demand. If consumption data is not available, TEP estimates consumption as described in the response to 4 a), then uses estimated consumption in the formula. Circumstances for estimating a meter read occur when TEP is unable to obtain an actual meter read.
UNS Electric, Inc.	The CIS doesn't estimate kW, therefore all situations are manually estimated. The customer would be billed with zero kW. If consumption data is not available, UNS Electric estimates consumption as described in the response to 4 a). Circumstances for estimating a meter read occur when UNS Electric is unable to obtain an actual meter read.

AZ UTILITY RESPONSES TO STAFF'S FIRST SET OF DATA RESPONSES

STAFF 1-1 QUESTIONS

9. Time-of-Use (TOU) estimate with at least one year of history. Same customer at same premises or new customer with at least one year of premises history.

AJO Improvement Company	See response to (1) above.
Columbus Electric Cooperative, Inc.	(a) The Cooperative does not estimate kWh consumption based on the premises history. In the scenario of same consumer same premises, the CIS system would estimate the consumer's bill based on the three most recent month average consumption. The three months on-peak and off-peak consumption would be averaged independent of each other. (b) If the consumers three most recent month's on or off-peak consumption were 512 kWh, 565 kWh & 595 kWh, the calculation would be (512 + 565 + 595)/3=359kWh. (c) The same procedure applies to all time-of-use consumers. (d) The calculations are the same for both residential and non-residential accounts. (e) This same procedure applies under any circumstances when residential or small commercial consumer's bill is estimated. (f) Anytime a consumer has at least three months of history this procedure always applies. (g) CEC makes every effort to read all of the Cooperative's meters every month, however there were cases in the past when residential meters were estimated due to locked gates, bad dogs, etc. In 2003 CEC began utilizing the ERTZ remote meter reading system, which allows our meter readers to retrieve reading from as far as a mile from their vehicles. With the exception of damaged or meter failure, this system has eliminated the need to estimate meters. (h) First and final bills for residential or small commercial accounts are not estimated.
Duncan Valley Electric Cooperative, Inc.	N/A – No TOU rates.
Garkane Energy Cooperative	Average kWh & kW usage of the last three months.
Graham County Electric Cooperative	N/A
Mohave Electric Cooperative, Inc.	For same customer or new customer at same premises with at least one year of premises history, Mohave uses: a) last month's history; b) last three month's average usage; c) usage this month last year. Add results of a, b and c and divide by the number of answers obtained in a , b and c. This amount will be the estimated usage for this account. If the meter has stopped, the meter will be changed, and the estimated usage will be determined by taking actual usage on the new meter for seven days, and then applying the average daily usage times the number of days in the original billing period and then using eighty percent (80%) of this result as the adjusted estimated kWh usage.
Morenci Water & Electric Company	MW & E does not have a time-of-use tariff.
Navopache Electric Co-op	Navopache uses previous month history with same customer same premises. New customer no premises history is used and 0 kWh is billed, customer charge is pro-rated.

AZ UTILITY RESPONSES TO STAFF'S FIRST SET OF DATA RESPONSES

STAFF 1-1 QUESTIONS

9. Time-of-Use (TOU) estimate with at least one year of history. Same customer at same premises or new customer with at least one year of premises history.

Sulphur Springs Valley Electric Cooperative	SSVEC uses previous month and same month previous year history.
Trico Electric Cooperative, Inc.	Time-of-Use has two readings, "on-peak" and "off-peak". The CIS system calculates the estimate using the "on-peak" and "off-peak" kWh, same month one year prior from the same premises.
Tucson Electric Power Company	TEP would generate a manually estimated bill based on customer usage from the previous year using the following formula: LAST YEAR'S USAGE FOR SAME MONTH divided by NUMBER OF DAYS IN BILLING PERIOD=PER DAY USAGE. PER DAY USAGE x NUMBER OF DAYS IN THIS MONTH'S CYCLE=ESTIMATED USAGE The CIS would generate a bill based on trend. Within TEP's CIS, a trend record is created from each billed service. This record becomes part of a trend table. During estimation, consumption from three prior bill cycles is compared to the consumption from the same cycle in the previous month to determine a trend. This trend, plus a tolerance, is used to create a usage amount for bill estimation. This would be done for on-peak usage and off-peak usage. If the estimation falls in a shoulder month then a manual estimation of shoulder would need to be done as the CIS doesn't estimate shoulder usage. The manual estimation would use last year's allocation factor with this year's estimated total consumption. A circumstance for estimating TOU occurs when TEP is unable to obtain actual meter reads.
UNS Electric, Inc.	The CIS system ("CIS") would generate a bill based on customer usage from the previous year using the following formula: LAST YEAR'S USAGE FOR SAME MONTH divided by NUMBER OF DAYS IN BILLING PERIOD = PER DAY USAGE PER DAY USAGE x NUMBER OF DAYS IN THIS MONTH'S CYCLE = ESTIMATED USAGE. This would be done for on-peak usage and off-peak usage. A circumstance for estimating TOU occur when UNS Electric is unable to obtain an actual meter read.

AZ UTILITY RESPONSES TO STAFF'S FIRST SET OF DATA RESPONSES

STAFF 1-1 QUESTIONS

10. TOU estimate with less than 12 months' history. Same customer at same premises.

AJO Improvement Company	See response to (1) above.
Columbus Electric Cooperative, Inc.	(a) The CIS system would estimate the consumer's bill based on the three most recent month average consumption. Consumer accounts with more than one month's history but less than three months history are calculated manually utilizing the methodology previously described. (b) If the consumer had three months of historical consumption, the calculation would be: 512 kWh, 565 kWh & 595 kWh, the calculation would be: (512 + 565 + 595)/3=359 kWh. If the consumer had more than one month's history but less than three, the calculation would be the same as described in the response 2 (b). (c) This applies to all time-of-use consumers. The consumers day and night consumptions would be calculated independent of each other in the manner previously described. (d) The calculations are the same for both residential and non-residential accounts. (e) This same procedure applies under any circumstance when a consumer's bill is estimated. (f) Anytime a consumer has at least three months of history, the CIS system estimates kWh consumption. If consumers have less than three months of history, the kWh is manually estimated. (g) CEC makes every effort to read all of the Cooperative's meters every month, however there were cases in the past when residential meters were estimated due to locked gates, bad dogs, etc. In 2003 CEC began utilizing the ERTZ remote meter reading system, which allows our meter readers to retrieve reading from as far as a mile from their vehicles. With the exception of damaged or meter failure, this system has eliminated the need to estimate meters. (h) First and final bill kWh or kW is never estimated.
Duncan Valley Electric Cooperative, Inc.	N/A – No TOU rates.
Garkane Energy Cooperative	Average kWh & kW usage of the last three months, or if less than three months history, then the last month's kWh & kW usage.
Graham County Electric Cooperative	N/A
Mohave Electric Cooperative, Inc.	For same customer at same premises with less than one year of premises history, Mohave uses: a) last month's history; and b) last three month's average usage. Add results of a) and b) and divide by the number of answers obtained in a) and b). Last month's usage would be used if less than three months usage history is available. If the meter has stopped, the meter will be changed, and the estimated usage will be determined by taking actual usage on the new meter for seven days, and then applying the average daily usage times the number of days in the original billing period and then using eighty percent (80%) of this result as the adjusted estimated kWh usage.
Morenci Water & Electric Company	MW & E does not have a time-of-use tariff.
Navopache Electric Co-op	Navopache uses previous month history.

AZ UTILITY RESPONSES TO STAFF'S FIRST SET OF DATA RESPONSES

STAFF 1-1 QUESTIONS

10. TOU estimate with less than 12 months' history. Same customer at same premises.

Sulphur Springs Valley Electric Cooperative	SSVEC uses previous month history.
Trico Electric Cooperative, Inc.	Time-of-Use has two readings, "on-peak" and "off-peak". The CIS system calculates the estimate using the "on-peak" and "off-peak" kWh of the past three months form the same premises.
Tucson Electric Power Company	TEP would generate a manually estimated bill based on customer usage from the previous year using the following formula: USAGE FOR PREVIOUS MONTH divided by NUMBER OF DAYS IN BILLING PERIOD=PER DAY USAGE PER DAY USAGE x NUMBER OF DAYS IN THIS MONTH'S CYCLE=ESTIMATED USAGE The CIS would generate a bill based on trend. Within TEP's CIS, a trend record is created from each billed service. This record becomes part of a trend table. During estimation, consumption from three prior bill cycles is compared to the consumption from the same cycle in the previous month to determine a trend. This trend, plus a tolerance, is used to create a usage amount for bill estimation. This would be done for on-peak and off-peak. If the estimation falls in a shoulder month then a manual estimation of shoulder would need to be done as CIS doesn't estimate shoulder usage. The manual estimation would use last month's allocation factor with this month's estimated total consumption. A circumstance for estimating TOU occurs when TEP is unable to obtain actual meter reads.
UNS Electric, Inc.	The CIS system ("CIS") would generate a bill based on customer usage from the previous month using the following formula: USAGE FOR PREVIOUS MONTH divided by NUMBER OF DAYS IN BILLING PERIOD = PER DAYS USAGE. PER DAY USAGE x NUMBER OF DAYS IN THIS MONTH'S CYCLE = ESTIMATED USAGE. This would be done for on-peak and off-peak. Circumstances for estimating TOU occur when UNS Electric is unable to obtain an actual meter read.

AZ UTILITY RESPONSES TO STAFF'S FIRST SET OF DATA RESPONSES

STAFF 1-1 QUESTIONS

11. TOU estimate with less than 12 months' history. New customer with premises history.

AJO Improvement Company	See response to (1) above.
Columbus Electric Cooperative, Inc.	(a) The CIS system would estimates the consumer's bill if there is more than three months history. If there is more than one month's history but less than three, the kWh is estimated manually. Consumption is never estimated based on premises history. (b) The formulas are the same as previously described. (c) The consumer's day and night consumptions would be calculated independent of each other in the manner previously described. (d) The calculations are the same for both residential and non-residential kWh estimates. (e) This same procedure applies under any circumstance when a consumer's kWh consumption is estimated. (f) The CIS system estimates kWh consumption when there are three or more months of history. If there is more than one month's history but less than three, the estimates are performed manually. (g) CEC makes every effort to read all of the Cooperative's meters every month, however there were cases in the past when residential meters were estimated due to locked gates, bad dogs, etc. In 2003 CEC began utilizing the ERTZ remote meter reading system, which allows our meter readers to retrieve readings from as far as a mile from their vehicles. With the exception of damaged or meter failure, this system has eliminated the need to estimate meters. (h) First and final bills are never estimated.
Duncan Valley Electric Cooperative, Inc.	N/A – No TOU rates.
Garkane Energy Cooperative	Average kWh & kW usage of the last three months, or if less than three months history, then the last month's kWh & kW usage.
Graham County Electric Cooperative	N/A
Mohave Electric Cooperative, Inc.	For new customer at same premises with less than one year of premises history, Mohave uses: a) last month's history; and b) last three month's average usage. Add results of a) and b) and divide by the number of answers obtained in a) and b). Last month's usage would be used if less than three months usage history is available. If the meter has stopped, the meter will be changed, and the estimated usage will be determined by taking actual usage on the new meter for seven days, and then applying the average daily usage times the number of days in the original billing period and then using eighty percent (80%) of this result as the adjusted estimated kWh usage.
Morenci Water & Electric Company	MW & E does not have a time-of-use tariff.
Navopache Electric Co-op	New customer no premises history is used and 0 kWh is billed, customer charge is pro-rated.

AZ UTILITY RESPONSES TO STAFF'S FIRST SET OF DATA RESPONSES

STAFF 1-1 QUESTIONS

11. TOU estimate with less than 12 months' history. New customer with premises history.

Sulphur Springs Valley Electric Cooperative	SSVEC uses previous month history.
Trico Electric Cooperative, Inc.	Time-of-Use has two readings, "on-peak" and "off-peak". The CIS system calculates the estimate using the "on-peak" and "off-peak" kWh of the past three months form the same premises.
Tucson Electric Power Company	TEP would generate a manually estimated bill based on customer usage from the previous year using the following formula: LAST YEAR'S USAGE FOR SAME MONTH divided by NUMBER OF DAYS IN BILLING PERIOD=PER DAY USAGE PER DAY USAGE x NUMBER OF DAYS IN THIS MONTH'S CYCLE=ESTIMATED USAGE The CIS would generate a bill based on trend. Within TEP's CIS, a trend record is created from each billed service. This record becomes part of a trend table. During estimation, consumption from three prior bill cycles is compared to the consumption from the same cycle in the previous month to determine a trend. This trend, plus a tolerance, is used to create a usage amount for bill estimation. This would be done for on-peak and off-peak. If the estimation falls in a shoulder month then a manual estimation of shoulder would need to be done as CIS doesn't estimate shoulder usage. The manual estimation would use last month's or last year's allocation factor with this month's estimated total consumption. A circumstance for estimating TOU occurs when TEP is unable to obtain actual meter reads.
UNS Electric, Inc.	The CIS system ("CIS") would generate a bill based on premises usage from the previous year using the following formula: LAST YEAR'S USAGE FOR SAME MONTH divided by NUMBER OF DAYS IN BILLING PERIOD = PER DAY USAGE. PER DAY USAGE x NUMBER OF DAYS IN THIS MONTH'S CYCLE = ESTIMATED USAGE. This would be done for on-peak and off-peak. Circumstances for estimating TOU occur when UNS Electric is unable to obtain an actual meter read.

AZ UTILITY RESPONSES TO STAFF'S FIRST SET OF DATA RESPONSES

STAFF 1-1 QUESTIONS

12. TOU estimate. No history. New customer at new premises.

AJO Improvement Company	See response to (1) above.
Columbus Electric Cooperative, Inc.	This would assume that this is the customer's first month's billing. Residential and small commercial accounts kWh are not estimated in the first month's billing. They are billed only the customer charge and applicable fees. Large commercial and industrial account estimates are performed in the manner previously described. (b) There is no calculation for this process. (c) This process applies to all time-of-use customers. (d) The process is the same for both residential and non-residential accounts. (e) This same procedure applies under any circumstance when a consumer's bill may require estimation. (f) This procedure applies to all consumer accounts when it is a first month estimate with no account history. (g) CEC makes every effort to read all of the Cooperative's meters every month, however there were cases in the past when residential meters were estimated due to locked gates, bad dogs, etc. In 2003 CEC began utilizing the ERTZ remote meter reading system, which allows our meter readers to retrieve reading from as far as a mile from their vehicles. With the exception of damaged or meter failure, this system has eliminated the need to estimate meters. (h) The first and final bills are never estimated.
Duncan Valley Electric Cooperative, Inc.	N/A – No TOU rates.
Garkane Energy Cooperative	No estimation, customer would pay minimum bill.
Graham County Electric Cooperative	N/A
Mohave Electric Cooperative, Inc.	With no history, Mohave will base estimated usage on actual usage for similar services similar customers for the same period. If the meter has stopped, the meter will be changed, and the estimated usage will be determined by taking actual usage on the new meter for seven days, and then applying the average daily usage times the number of days in the original billing period and then using eighty percent (80%) of this result as the adjusted estimated kWh usage.
Morenci Water & Electric Company	MW & E does not have a time-of-use tariff.
Navopache Electric Co-op	Navopache bills 0 kWh and pro-rates the customer charge.
Sulphur Springs Valley Electric Cooperative	Exhaust all means to secure hard read, move customer account to different billing cycle(s), bill NO READ with Base Charge.
Trico Electric Cooperative, Inc.	If no history exists the CIS system will bill the fixed monthly charge only. The kWh will be billed with the next valid read.

AZ UTILITY RESPONSES TO STAFF'S FIRST SET OF DATA RESPONSES

STAFF 1-1 QUESTIONS

12. TOU estimate. No history. New customer at new premises.

Tucson Electric Power Company	A manual estimation would be done using new meter usage methodology. TEP would wait until it gets a good read on the new meter and use the following formula: NEW METER READ – BEGINNING READ TIMES METER CONSTANT divided by NUMBER OF DAYS = PER DAY USAGE. PER DAY USAGE x NUMBER OF DAYS IN PREVIOUS BILLING PERIOD = ESTIMATED USAGE. This would be done for each time period value. A circumstance for estimating TOU occurs when TEP is unable to obtain actual meter reads.
UNS Electric, Inc.	A manual estimation would be done using new meter usage methodology. UNS Electric would wait until it gets a good read on the new meter and use the following formula: NEW METER READ – BEGINNING READ x METER CONSTANT divided by NUMBER OF DAYS = PER DAY USAGE. PER DAY USAGE x NUMBER OF DAYS IN PREVIOUS BILLING PERIOD = ESTIMATED USAGE. This would be done for each time period value. Circumstances for estimating TOU occur when UNS Electric is unable to obtain an actual meter read.

AZ UTILITY RESPONSES TO STAFF'S FIRST SET OF DATA RESPONSES

STAFF 1-1 QUESTIONS

13. Should you have procedures in place to respond to circumstances not listed above, please describe both the circumstances and applicable procedures for estimation.

AJO Improvement Company	See response to (1) above.
Columbus Electric Cooperative, Inc.	Columbus Electric Cooperative, Inc. makes every effort to read all the meters served by the system every month. All new single phase meters purchased are ERTZ meters, which can be read from a distance, eliminating such things as dog and gate problems. Meter damage or failure happen on rare occasions but the processes for dealing with those issues are explained in detail in the response to the above questions. Large commercial estimating processes differ from residential and small commercial accounts because these types of accounts historically use more energy.
Duncan Valley Electric Cooperative, Inc.	Seasonal usage patterns are taken into consideration when performing estimates / averaging. When in doubt, lower numbers are used for averaging. Where there is no clear cut pattern of usage, customer is contacted and we come to an agreement on an estimated bill.
Garkane Energy Cooperative	N/A
Graham County Electric Cooperative	N/A
Mohave Electric Cooperative, Inc.	If consumer can provide verifiable information regarding usage during a billing period that included estimated usage, this estimate will be adjusted based on customer provided information.
Morenci Water & Electric Company	MW & E has not encountered circumstances where it would need to estimate usage except when it is denied access to the meter or the meter stops working.
Navopache Electric Co-op	None.
Sulphur Springs Valley Electric Cooperative	None.
Trico Electric Cooperative, Inc.	None.
Tucson Electric Power Company	TEP has no procedures in place at this time.
UNS Electric, Inc.	UNS Electric has no procedures in place at this time.

APPENDIX D

Staff DR 2-1 Cust. Ref.[1]	Period	No. of Estimates (Consecutive)	Reasons for Estimates	Action Taken	Reason for Estimate Shown on Bill?
1)	9/97 – 10/00	6 (3 – 1x)	Cooler in way	1 – no access letter 5 – bill notices[2] 1 – no record[3]	No
2)	1/01	1 (1)	Snow	1 – bill notice	Yes
3)	1/01	1 (1)	Rain	1 – bill notice	Yes
4)	8/00 – 11/00	4 (4 – no usage estimated in 4th month - manual)	Dirty meter glass (2) Flood (2)	1 – no access letter 4 – bill notice	Yes – Flood No – Dirty Meter Glass
5)	3/97 – 4/04	12 (3 – 2x)	Estimate (2) Rain (5) Under read (2) Meter removed (1) Snow (1) Dog (1)	7 – no record 5 – bill notice 1st 3 month consecutive read – no record 2nd 3 month consecutive read – bill notice (weather)	Yes – Rain (3) Yes – Snow (1) No – Meter change (11/00) No Record – Oct 99 and earlier
6)	NA	None	NA	NA	NA
7)	8/95 – 6/02	12 (2)	No answer at door (5) Dog (1) Locked gate (5) Irrigation (1)	4 – no record 8 – bill notice 1 – dialer	Yes No record – May 99 and earlier
8)	3/01 – 7/01	3 (2)	Locked gate (3)	3 – bill notice	Yes
9)	9/98 – 9/04	13 (3 – 2x)	Foliage (1) Error code (4) No reason (1)	12 – bill notice 3 – meter change (but last meter change	Yes – Locked gate (1x) No – Other occasions (11) No record – Sept 98

[1] See Page 6 for questions asked in Staff DR 2-1.
[2] "Bill Notice" refers to the notice provided on the customer bill that the bill was based on an estimated meter reading.
[3] "No Record" refers to information related to actions taken and copies of customer bills not available in all periods (1999 and earlier).

Staff DR 2-1 Cust. Ref.[1]	Period	No. of Estimates (Consecutive)	Reasons for Estimates	Action Taken	Reason for Estimate Shown on Bill?
			Faded screen (1) Blank display (4) Locked gate (2)	occurred one year after faded screen message and four blank displays	
10)	9/01	1	Dead meter	Damaged meter adjustment sent with statement and letter	Reported as "unmeasured usage" – letter sent with bill
11)	9/00 – 11/04	7 (2)	Locked gate (1) Dog (1) No answer at door (3) Defective meter (2)	7 – bill notices 1 – meter change	Yes – Locked gate (1) Yes – Dog (1) Yes – No answer at door (3) No – Defective meter
12)	7/00 – 8/01	6 (2)	Meter change (1) Locked gate (3) Business not open (1) No key (1)	5 – bill notices 1 – meter read schedule mailed	Yes – except for meter change
13)	7/00 – 10/04	4 (1)	Under read (2) Locked gate (1) Frozen meter (1)	4 – bill notices 1 – meter change	Yes – Locked gate No - Other
14)	12/95 – 5/03	21 (2)	Locked gate (15) Other (1) Blocked meter (1) Meter change (2) Unable to locate (2)	11 – no record (all but one prior to 1999) 8 – bill notices 1 – dialer 2 – no access letters	Yes – Locked gate (2) Yes – Blocked meter (1) Yes – Meter change (1) No – No reason (3) No – No record (13)
15)	11/98 – 6/03	25 (5 – 1x, 11 – 1x)	Blocked (24) Dog (1)	4 – no record (prior to Sept 99) 21 - Bill notice 5 - No access letters 5 - Blue card	Yes – Blocked meter (17) Yes – Dog (1) No – No record (4)

Staff DR 2-1 Cust. Ref.[1]	Period	No. of Estimates (Consecutive)	Reasons for Estimates	Action Taken	Reason for Estimate Shown on Bill?
				5 - Dialer	
16)	7/96 – 1/02	17 (5 – 2x)	Dog (15) Blocked meter (2)	13 - Bill notices 2 – Blue card 1- Sent meter read schedule 1 – No access letters 0 - Dialer calls 8 – Field visits (2 possibly i/c/w returned checks)	Yes – Dog (11) Yes – Blocked meter (1) No – No record (5)
17)	12/01 – 9/04	2 (1)	Under read (1) Meter change (1)	2 – Bill notices	No
18)	1/01 – 11/01	5 (2)	Dog (3) Gate locked (1) Meter change (1)	5 – Bill notices	Yes – Dog (2) No – No reason (3)
19)	7/99 – 2/02	7 (3 – 1x)	Rain (2) Snow (3) Estimate (2)	6 – Bill notices 1 – Dialer 1 – No record (7/99)	Yes – Snow (3) Yes – Rain (1) No – No reason (2) No – No record (1)
20)	10/98 – 9/04	30 (4 -1x, 3-1x)	Locked gate (18) Gate latch out of reach (8) Gate not accessible (1) Blocked meter (1) No key (1) Dog (1)	15 – Bill notices 5 - Door hanger 2 – Sent meter reading schedule (2) 4 – Dialer 7 – No record (prior to 9/99)	Yes – Locked gate (7) Yes – Gate latch out of reach (8) Yes – Gate not accessible (1) Yes – No key (1) Yes – Blocked meter (1) Yes – No key (1) No – No reason (3) No – No record (9)

Staff DR 2-1 Cust. Ref.[1]	Period	No. of Estimates (Consecutive)	Reasons for Estimates	Action Taken	Reason for Estimate Shown on Bill?
21)	1/02 – 5/04	4 (1)	Other (1) Rain (1) Blocked (2)	4 – Bill notices	Yes – Blocked meter (2) Yes – rain (1) No – No reason (1)
22)	4/02	1	Dead meter (1)	3 corrected bills issued	NA
23)	7/02	1	Rain (1)	1 - Bill notice	Yes
24)	7/02 – 8/02	2	Other (2)	2 – Bill notices 1 – Dialer	No – No reason (2)
25)	10/02	1	Dead meter (1)	NA	NA
26)	8/98 – 5/03	6 (2)	Locked gate (1) Foliage (2) Other/safety (1) Unable to locate (1) RV (1)	5 – Bill notices 1- Customer call (safety)	Yes – Foliage (1) No – No reason (4) No – No record (1)
27)	7/02 – 2/03	8 (8)	No peak read (1) Locked gate (3) Meter change (2) Other (2)	8 – Bill notices 2 – Dialer 1 - Policy allowance - $50	Yes – Locked gate (3) No – No reason (5)
28)	12/02	1	Snow (1)	1 – Bill notice	Yes
29)	7/00 – 10/04	18 (3 – 2x)	Locked gate (13) No answer (4) Dog (1)	17 – Bill notice 2 – Dialer 5 – Door hanger 1 – No access letter 1 – Blue card	Yes – Locked gate (12) Yes – No answer (3) Yes – Dog (1) No – No reason (2)
30)	10/03	1	Correct over read	NA	NA
31)	3/98	1	Not available	NA	NA
32)	4/01 – 4/04	3 (1)	Other (1) Rain (2)	3 – Bill notices	Yes – Rain (2) No – No reason (1)

Staff DR 2-1 Cust. Ref.[1]	Period	No. of Estimates (Consecutive)	Reasons for Estimates	Action Taken	Reason for Estimate Shown on Bill?
33)	4/04 – 5/04	2 (2)	Foliage (2)	2 – Bill notices 1 – Customer call	Yes – Foliage (1) No – No reason (1)
34)	5/04	1	Meter issue (1)	1 - Bill notice 1 – Meter change	No
35)	2/99 – 7/04	5 (2)	Low peak (1) No key (1) High demand (1) Blank display (2)`	3 – No record (July 99 and earlier) 2 – Bill notices 1 – Meter change	No – No record (3) No – No reason (1) Yes – Meter change (1)

Staff 2-1 Please answer questions "a" through "g" for each of the (35) customers listed on the accompanying attachment.

a. Identify and provide a copy of all estimated bills sent to these customers since 1990. Also, provide the bills from the month before and the month after each estimated bill.

b. For each estimated bill, explain in detail why it was estimated.

c. For reason identified in response to part b, identify the ACC regulation that permits the estimation. (Use both old rule 210 and most recent rule 210).

d. Please list any bills that were estimated but that do not specifically fall within the parameters listed in either old rule 210(A)(5) or most recent rule 210(A)(3).

e. For each estimated bill, please identify the rate schedule to which the customer subscribed. In addition, please indicate whether the estimation was for demand only, kWh only, TOU only, or a combination. If a combination, please identify all usage elements that were estimated.

f. For each estimated bill, please provide a worksheet that describes the process and calculations by which the estimation was determined. Please include a narrative description of the process.

g. Please indicate which, if any, of these customer's bills were automatically estimated using billing software. Please indicate which bills, if any, were manually estimated.

APPENDIX E

APPENDIX E

OTHER ELECTRIC UTILITY METER READING AND BILLING PRACTICES

	Company F (Southeast)	Company G (Southwest)	Company H (Mountain)	Company I (Southeast)	Company J (Midwest)
1) Describe practices used to estimate usage (kWh) and demand (kW) when a meter reading is not obtained. ○ **Are degree days or historical consumption per day (perhaps seasonal averages) used to estimate usage?** ○ **Is customer specific information or class averages, or a combination (e.g. customer specific but a class average load factor), used to estimate demand?**	System automatically estimates energy accounts based on historical use. Algorithm is now being changed to make use of Automatic Meter Reading (AMR) reads. Special service accounts (SSA's), i.e. demand accounts, are read daily and not estimated.	Estimate energy use based on use in the same time period of previous year. Adjust use based on temperature. Do not estimate demand accounts.	Estimate energy use based on last year's current month or the average of last year and year before. Use is not adjusted for degree-days. All estimates are "signed off on" by a person in billing. They do not estimate demand. Demand bills are delayed until they can get an actual read.	Estimate use based on historical use adjusted for weather patterns and degree-days. Estimating formula can be adjusted for extensive power outages such as the hurricanes this last season. In North and South Carolina they maintain a read rate of 0.25 to 0.50 missed reads per 1000 meters. Demand is also estimated (very seldom).	Estimated use per day is calculated based on individual historical use adjusted by heating and cooling degree-days. Demand not normally estimated. Demand bills may be delayed pending actual read.
2) Describe practices used to adjust estimated demand and usage when actual readings are obtained.	Estimated bill only adjusted if subsequent actual bill fails normal high/low checks.	When an actual read is obtained following and estimated bill, a two month bill is issued (estimated bill cancelled) automatically.	The estimated bill is not rebilled when an actual read is taken in the subsequent month. Any correction is allowed in the current month (month with actual reading).	Based on normal irregularity checks of the system, an estimated bill may be rebilled if the subsequent actual read bill is way off. Particularly for commercial and industrial accounts.	Energy use is allowed to "true up" with next actual read. Normal high/low bill checks are applied. Demand is checked via meter interval data and will be rebilled if not reasonable.
3) What practices are followed to secure an actual meter reading following several consecutive months of estimated bills (that is, other than the normal monthly meter readings)?	Customer contacts are initiated after several consecutive estimates. Action may include conversion to AMR.	Can estimate meter for two months. They force a meter read for the third month. Meter may be changed to an AMR meter in hard to access areas.	They pursue actual readings each month.	After 3 estimates, the customer is called and sent letters to obtain reading. May use customer postcard read and may install Automatic Meter Reading (AMR) meter.	For multi-month estimates, phone calls and personal contacts are attempted to arrange appointments for special reading. These become more aggressive each month and may lead to service disconnection at pole or curb.

Disclaimer – Based on an informal telephone survey. Not intended to represent an official company response.

4) Are meters read and billed monthly?	Meters are read and billed monthly.	Meters are read and billed monthly.	Meters are read and billed monthly.	Meters are read and billed monthly.	Most meters are read daily (AMR and general primary) or monthly. Some meters are read bi-monthly. Billing for all meters is monthly.

Disclaimer – Based on an informal telephone survey. Not intended to represent an official company response.

	Company A (Western)	Company B (Southwest)	Company C (Northwest)	Company D (Western)	Company E (Southwest)
1) Describe practices used to estimate usage (kWh) and demand (kW) when a meter reading is not obtained. ○ **Are degree days or historical consumption per day (perhaps seasonal averages) used to estimate usage?** ○ **Is customer specific information or class averages, or a combination (e.g. customer specific but a class average load factor), used to estimate demand?**	1. a) Our CIS will automatically estimate some kWh meters. Those that can't be estimated come out on an exception report and rereads are issued. After an account is estimated twice an actual read must be obtained. 1. b) In general terms we don't estimate demand. We issue rereads. If a kW account has gone unbilled for a long period of time or can't be billed for some reason, we will use prior history to estimate a bill.	1 a). Estimate based on previous month's consumption or same month last year. Do not adjust for weather (degree days). 1 b). Estimated demand (kW) based on load factor.	1 a). Makes use of AMR read up to 6 days prior to bill date. If no AMR read CIS estimates based on use in same month of previous year adjusted for degree-days. Change being made to make estimating algorithm more precise by using weather patterns by zip codes. 1 b). Generally do not estimate demand. Delay bill until read obtained. In rare cases a manual estimate may be used.	Estimate energy (kWh) based on same month last year or last month or average of last 3 months or average of last 12 months (whichever period has actual reads). Use a base line factor by region. Compare estimate to composite. Do not use degree-days. Do not estimate demand (kW).	Delay energy (kWh) bills up to 5 days to obtain read before estimating. Estimate meters individually based on average of 2 prior months use and use 12 and 13 month's prior. No degree-day adjustment. Can estimate demand (manually) but it is very rare. Overall have only 5.36 estimates per 1000 reads.
2) Describe practices used to adjust estimated demand and usage when actual readings are obtained.	The estimates stand unless there is a significant variance. In that case, we cancel the prior estimated bills and issue a new bill based upon current use.	When an actual read is obtained following an estimate, if estimated use is within + or – 35% of ½ total use for two months, leave estimate as is. If outside of 35%, estimate is rebilled (two month bill issued).	Do not rebill previous estimate based on subsequent actual read – system automatically "true-up" reads.	If actual read after the estimate triggers normal high/low checks, previous estimate is rebilled. Rebill rate is less than 0.5%.	Actual read after an estimated read can be up to 500 kWh under the estimate before the estimate is rebilled. System can bill negative use up to 500 kWh.
3) What practices are followed to secure an actual meter reading following several consecutive months of estimated bills (that is, other than the normal monthly meter readings)?	We have a staff of reread personnel that work to resolve access issues. We have a number of options for customers including but not limited to: ○ Sending a notice of the read date for the customer to provide access (put dogs away, leave gate unlocked, etc).	After several estimates (starting at 3 sequential estimates) send registered letter to gain access. Process may lead to disconnection at the pole.	After three estimates meter is referred to special team to obtain read. They initiate special contacts and letters. May disconnect if no access to meter is provided.	Allow a maximum of 3 estimates for residential and 6 estimates for commercial accounts. Company initiates contact process for access to the meter. Process may include installing remote read device, drive by read device or moving meter outside.	Start calls to customer and site visits after 3 consecutive estimates. Process can actually lead to disconnection at the pole.

Disclaimer – Based on an informal telephone survey. Not intended to represent an official company response.

	○ Angle adaptors so the meter can be read over a fence or from the neighbor's yard. ○ Hexagram meters with remote scan disc. ○ RF meters (new this year). ○ Customer read card. ○ Customer provided key for access				
4) Are meters read and billed monthly?	We bill for water and electric service along with sewer, trash and city tax. Residential customers are billed bi-monthly and commercial/industrial are billed monthly.	Meters are read and billed monthly.	Meters are read daily (AMR) and bill monthly.	Meters are read and billed monthly. Read rate is over 99.87%.	Meters are read and billed monthly.

Disclaimer – Based on an informal telephone survey. Not intended to represent an official company response.