



ORIGINAL



0000014376

RECEIVED

Jana Van Ness
Manager
Regulatory Affairs

2004 NOV 23 P 3: 59

Tel 602/250-2310
Fax 602/250-3003
e-mail: Jana.VanNess@aps.com
<http://www.apsc.com>

Mail Station 9908
P.O. Box 53999
Phoenix, AZ 85072-3999

32

AZ CORP COMMISSION
DOCUMENT CONTROL

Arizona Corporation Commission
DOCKETED

NOV 23 2004

DOCKETED BY 

November 23, 2004

Docket Control
Arizona Corporation Commission
1200 West Washington
Phoenix, Arizona 85007

RE: Docket NO's. E-01345A-03-0775 and E-01345A-04-0657
Declaratory Order and Bill Estimation

Dear Sir/Madame:

Pursuant to Procedural Order dated November 2, 2004, Arizona Public Service Company ('APS') hereby files its Testimony for David J Rumolo and Tammy Mcleod in above referenced Dockets.

If you or your staff should have any questions, please feel free to call me.

Sincerely,

Jana Van Ness
Manager
Regulatory Affairs

JVN/bec

Cc: Docket Control (Original, plus 15 copies)
Parties of Record

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26

TESTIMONY OF DAVID RUMOLO

On Behalf of Arizona Public Service Company's

Application for Declaratory Order

Docket No. E-01345A-03-0775

November 23, 2004

Table of Contents

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26

I. INTRODUCTION..... 1

II. SUMMARY OF TESTIMONY 2

III. DEFINITION OF ESTIMATED BILL 3

IV. APS ESTIMATION PROCEDURES 8

V. APS COMPLIANCE WITH COMMISSION REGULATIONS AND
ORDERS AFFECTING ESTIMATION..... 17

VI. IMPACT OF BILL ESTIMATION 22

VII. CONCLUSION 28

STATEMENT OF QUALIFICATIONS APPENDIX A

APS ESTIMATION METHODS..... SCHEDULE DJR-1

SUMMARY OF ESTIMATION PROCEDURE IMPACTS SCHEDULE DJR-2

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26

TESTIMONY OF DAVID RUMOLO
ON BEHALF OF ARIZONA PUBLIC SERVICE COMPANY
(Docket No. E-01345A-03-0775)

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. David J. Rumolo, 400 North Fifth Street, Phoenix Arizona, 85004

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am the Manager of Pricing and Regulation for Arizona Public Service Company ("APS" or "Company"). My Statement of Qualifications is attached as Appendix A.

Q. WOULD YOU PLEASE DESCRIBE THE FUNCTIONS OF THE COMPANY'S PRICING AND REGULATION DEPARTMENT?

A. The department is responsible for all pricing-related activities including cost of service analyses, rate development, service policy development, rate administration, and development of material for filings with regulatory bodies such as the Arizona Corporation Commission ("Commission").

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to describe the methods used by APS to estimate a customer's energy consumption (kWh) and demand (kW) when the data cannot be obtained from the customer's meter. I discuss the reasons why I believe that APS' methodologies for estimating consumption and demand are reasonable and in compliance with applicable Commission rules. I also summarize an analysis that examined the potential financial impact to APS and its customers resulting from the application of the estimating methods used by APS today and in previous years.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26

II. SUMMARY OF TESTIMONY

Q. WOULD YOU PLEASE SUMMARIZE YOUR TESTIMONY?

A. Yes. The definition of what constitutes an "estimate" has been discussed at great length in the industry and is a critical issue that must be resolved in this proceeding. My testimony provides a practical consensus view of Arizona utilities on this issue after examining ten specific instances that could arguably lead to a belief that such instances resulted in an "estimated bill." The methodologies that APS utilizes (both past and present) for estimating energy consumption (kWh) and demand (kW) when actual metered information is unavailable use a combination of customer-specific historical data and the demands of similarly situated customers; that is, APS customers on the same rate schedule.

The testimony provides a brief chronology of the changes in the data inputs to the estimation process that have occurred over time as we implemented a new customer information system ("CIS") and improved our estimation techniques. The progressive improvements to these techniques are more accurate, which I believe is the fairest result, to all involved: the customer who is receiving a bill based on estimated usage, the rest of APS' customers, and APS.

Complainant Read's contention that APS had no authority to bill customers on estimated usage due to lack of an approved estimation method is flawed. Similarly, APS' estimation formula appropriately considers the customer's consumption during both the previous month and the same month of the previous year, where applicable. Thus, our estimation process is consistent with the relevant Commission regulations and orders.

Finally, my testimony provides the results of an analysis that we performed to test the reasonableness of our estimation methodologies by taking a statistically

1 valid sample of customer bills that were based on actual meter readings and
2 comparing those bills to those that customers would have received had we
3 billed based on estimated consumption using the differing data inputs I
4 describe in my testimony. The results of those analyses indicate that, on
5 average, APS under bills customers when a bill is rendered on estimated usage.
6 Based on our current estimating practices, we would have under billed
7 customers by approximately \$400,000 as compared with total retail revenues
8 of approximately \$1.8 billion. This is a reduction in the net under billing of
9 those customers compared to the estimates used prior to 2004, but it is still a
10 net under billing. Thus, I believe it can easily be concluded that our approach
11 to estimation of customer usage is, and has been, reasonable and lawful.

12 III. DEFINITION OF ESTIMATED BILL

13 Q. WHAT IS AN "ESTIMATED BILL"?

14 A. The term "estimated bill" is actually a misnomer. There are no estimated bills,
15 *per se*. In reality, APS estimates kWh consumption and/or estimates kW
16 demand. The bill is then calculated precisely using the estimated usage and the
17 appropriate Commission-approved rates. In essence, the estimation
18 methodology estimates meter reads.

19 Although based on available customer data (for that particular customer or for
20 a class of customers), an estimate is just that, an estimate; i.e., a reasonable
21 approximation. It will almost certainly be higher or lower for a specific
22 customer than the actual consumption or the actual meter read. As
23 contemplated by the Commission's rules, an estimate must be made when an
24 actual read of the customer's meter cannot be obtained, because electric
25 utilities are required to bill the customer for each billing period (usually 25 to
26 35 days).

1 Despite its inaccuracy, the term "estimated bill" has been used throughout this
2 proceeding, and thus I will adopt that same usage in my testimony. APS and
3 the other utility participants in the Process Standardization Work Group
4 ("PSWG") have spent a significant amount of time on the issue of what
5 constitutes an "estimated bill" within the meaning of A.A.C. R14-2-210 ("Rule
6 210"). The most common bill estimation situation occurs when the utility
7 cannot access the customer's meter to obtain a meter read (e.g., locked gate,
8 dangerous dog, weather, etc.). APS identified the following ten separate
9 situations involving customer bills where there conceivably could be a question
10 as to whether the bill was "estimated" within the meaning of Rule 210. The 10
11 identified situations are:

- 12 1) Situation 1 – Characterization of the first bill after a billing period
13 for which consumption was estimated
- 14 2) Situation 2 – Characterization of a bill if rates change in the
15 middle of a billing cycle
- 16 3) Situation 3 – Characterization of a bill issued prior to obtaining a
17 valid meter reading, which bill is later adjusted after a valid read
18 is obtained
- 19 4) Situation 4 – Total meter failure or malfunction resulting in no
20 available reliable information
- 21 5) Situation 5 – Meter failure or malfunction but some data is
22 available
- 23 6) Situation 6 – Meter reading is not available using electronic meter
24 reading information but data is obtained from visual meter
25 reading
- 26 7) Situation 7 – Meter reading information is not available because
the service is provided on an un-metered basis such as street
lighting service
- 8) Situation 8 – Unbundled service for direct access customers is
provided on the basis of load profiles rather than using interval
data metering

- 1 9) Situation 9 – Meter tampering results in lack of metered
2 consumption information
- 3 10) Situation 10 – An electronic meter reading is obtained but the
4 data cannot be transferred to a billing computer

5 *Situation No. 1* is present every time an “estimated bill,” that is, a bill using
6 estimated consumption, is issued. How do Arizona utilities characterize the bill
7 covering the billing period *after* that billing period for which consumption was
8 estimated? In other words, there is a valid meter read at the end of period one
9 (e.g., May) but no read after period two (e.g., June), resulting in the issuance of
10 an “estimated” bill for period two.

11 The utility then obtains an accurate meter read for period three (e.g., July).
12 Although there could be a question whether the billing for period three is
13 “estimated,” APS considers that period three’s bill was not “estimated” within
14 the meaning of the Commission’s rules and regulations because it is based on
15 an actual read. Moreover, APS is unaware of any other Arizona utility that
16 treats this period three bill as “estimated.”

17 *Situation No. 2* is likewise a common situation for any utility using cycle
18 billing, that is, when meters are read throughout the calendar month in a series
19 of billing “cycles.” Is a bill considered “estimated” if rates change in the
20 middle of a customer’s billing cycle, which will happen for some customers
21 regardless of the effective date of the rate change? APS believes that this is
22 considered a non-estimated bill if the billing cycle’s consumption was based on
23 a valid meter read even though the usage was pro-rated to the appropriate
24 number of days’ consumption to apply the new and old rates. Again, APS’
25 position is consistent with that of other Arizona utilities.

1 *Situation No. 3* results when a bill must be issued prior to obtaining a valid
2 meter read. Amended Rule 210A requires that bills reflect no more than 35
3 days' consumption. If a customer's read is late or the utility meter read is
4 delayed beyond the 35-day maximum by weather, lack of timely access to the
5 meter, etc., this results in an "estimated" bill, followed by a "corrected" bill.
6 APS' treatment of this situation is that there is no estimation involved in this
7 second bill because the bill is "corrected" to reflect the actual consumption
8 once the meter read is obtained. As with Situations 1 and 2, APS believes its
9 practice consistent with that of other Arizona utilities.

10 *Situation No. 4* is one involving total meter failure or malfunction under
11 circumstances where there is no means of reading the meter or where it cannot
12 be determined when and to what degree the meter has failed, either in whole or
13 in part. APS considers that these circumstances necessitate the issuance of an
14 "estimated" bill.

15 *Situation No. 5* also assumes meter malfunction. But in these instances, the
16 time and impact of the malfunction can be precisely determined such that the
17 usage recorded by the meter can be mathematically adjusted to produce the
18 customer's actual usage for the billing period or periods in question. For
19 example, if one leg of a three-phase meter fails, the usage has been under-
20 recorded by one-third. Other examples include use of the wrong meter
21 multiplier, current transformer ratio error, or if a meter tests a consistent and
22 constant percentage slow or fast. APS does not consider these circumstances to
23 produce "estimated" bills, nor do other Arizona utilities.

24 *Situation No. 6* assumes that the utility, using an electronic meter reading
25 system (e.g., an Itron probe), cannot obtain an accurate read either due to
26 access issues or equipment failure. However, the meter reader does visually

1 read and manually records the customer's usage. The resultant bill is not
2 "estimated."

3 *Situation No. 7* covers instances when the Commission-approved rate schedule
4 itself calls for non-metered usage to bill the customer. This is common in
5 certain street and private lighting services. APS also has a Commission-
6 approved rate schedule that provides for service to extra-small General Service
7 customers on a non-metered basis. Obviously, bills for these services are not
8 "estimated" bills within the meaning of the Commission's regulations.

9 *Situation No. 8* is unique to load-profiled direct access customers (below 20
10 kW). Because these under 20 kW customers are not required by the Retail
11 Electric Competition Rules to use interval metering, their metered monthly
12 usage is allocated to specific days and times based on class load profiles. This
13 load profile information is then used to bill Energy Service Providers ("ESPs")
14 for transmission service and for generation settlement purposes (both are
15 FERC-regulated services). Again, since load profiling has been specifically
16 authorized by the Commission, and the services provided to ESPs are FERC-
17 regulated, APS has concluded that load profiling is not bill "estimation."¹

18 *Situation No. 9* is a meter tampering situation. Unless the tampered meter falls
19 into the "known failure" (both as to time and extent) situation described in
20 Situation No. 5, APS believes that this requires issuance of an "estimated" bill.

21 *Situation No. 10* involves the rare instance where there is an accurate electronic
22 meter read, but the billing computer cannot, for some reason, download the
23 read for billing purposes. The result is an "estimated" bill.

24
25 ¹ Even if this were considered an "estimated" bill, it usually would be the ESP's
26 bill that was "estimated."

1 Q. WHY DOES IT MATTER WHETHER THERE IS AGREEMENT BY
2 THE COMMISSION ON WHAT CONSTITUTES AN "ESTIMATED
3 BILL"?

4 A. The Commission's rules require APS to label such bills as estimates. There are
5 also actions required of electric utilities upon the issuance of the third
6 consecutive bill based on an estimated meter read. Indeed, it is the
7 disagreement between Complainant and APS over the characterization of the
8 situation described in my testimony and the Company's Application as
Situation No. 1 that is at issue in Complainant's Complaint.

9 Q. IS APS ASKING THE COMMISSION TO CONFIRM THE
10 COMPANY'S INTERPRETATION AS TO WHAT CONSTITUTES AN
11 "ESTIMATED BILL" IN EACH OF THE ABOVE TEN
12 CIRCUMSTANCES?

13 A. Yes.

14 IV. APS ESTIMATION PROCEDURES

15 Q. PLEASE SUMMARIZE APS' ESTIMATING PROCEDURES.

16 A. There are two measures of electric usage that may be estimated: 1) the amount
17 of energy consumed (kWh) during the billing period and 2) maximum demand
18 (kW) during the billing period. To estimate energy usage (kWh), APS'
19 preferred approach is to use the customer's average daily usage for the same
20 season. If there is insufficient information to do so, APS then uses the
21 customer's usage from the previous month, if it is in the same season, or the
22 customer's usage from the same month of the previous year, which is
23 necessarily in the same season as the month for which consumption is being
24 estimated. For recently connected customers, APS uses the previous usage for
25 the same premises. Because the number of days in the customer's billing
26 period varies from one month to another, APS calculates estimated energy

1 usage on a daily basis and multiplies this daily average by the number of days
2 in the period.

3 To estimate demand (kW), APS applies the applicable time component (i.e.,
4 the number of days) and the class average load factor to the estimated energy
5 use. APS would use the same formula to estimated demand in the admittedly
6 unusual circumstance where a valid energy (kWh) reading has been obtained
7 without a valid demand reading.

8 **Q. WHAT ARE THE APS CATEGORIES OF ESTIMATING?**

9 **A.** APS' estimating categories are as follows:

10 **A.** Estimates for Active Accounts, Including Initial and Final Bills

11 1. Estimating Energy Usage (kWh)

12 a. Existing Meter with Account History

13 i. Seasonal Average Method

14 ii. Previous Month Method

15 iii. Same Month Previous Year Method

16 iv. Time-of-Use Energy Allocation

17 b. New Meter Set Without Account History

18 2. Estimating Demand (kW)

19 a. Residential Time-of-Use Demand Service Plan

20 b. Residential Non-Time-of-Use Demand Service
21 Plan

22 c. Non-residential Demand Estimates

23 **B.** Adjusting Estimated Usage Based on Subsequent Actual Read

24 **C.** Estimating When Customer Diverts Energy

25 **D.** Estimating in the Event of Meter Failure

26 1. Complete Meter Failure ("dead meters")

2. Slow/Fast Meters

1 Detailed descriptions of the specific estimating methods for each of the
2 situations listed above are found in **Schedule DJR-1**.

3 **Q. HAS APS MODIFIED ITS ESTIMATION PROCEDURES FROM TIME**
4 **TO TIME?**

5 A. Yes. Although the Claimant has incorrectly claimed that APS has changed its
6 estimating procedures, in fact, we have only changed an estimating factor in
7 the same procedure to improve our billing estimation accuracy. Over time, the
8 data inputs have evolved and been refined, but the underlying techniques and
9 formulae have been consistent. For the purposes of my testimony, I have
10 divided the process timeline into 5 segments; 1) estimation under the "old" CIS
11 that was in place prior to September 1998, 2) estimation when the new CIS
12 became operational in 1998, 3) demand estimation modifications that became
13 effective in 1999, 4) demand estimation modifications that became effective in
14 2002, and 5) demand estimation modifications that became effective in 2004.

15 **Q. HOW DID APS ESTIMATE READS PRIOR TO SEPTEMBER 1998?**

16 A. Prior to September 1998, APS generated bills using a computer system
17 commonly referred to as "old CIS." When estimated bills were necessary, the
18 old CIS estimated both consumption (kWh) and demand (kW) based
19 principally on a customer's account history. Consumption was estimated based
20 on the customer's usage during the same month of the previous year and the
21 amount of usage during the preceding two months of the same year. A
22 geographic weather adjuster was also applied to the estimated kWh, but there
23 was no seasonal differentiation. Demand was estimated by applying a "load
24 factor" (the ratio of a customer's average hourly usage to the customer's peak
25 hourly usage), which was calculated by averaging the load factors from the two
26 previous months and the same month of the prior year.

1 For example, assume that consumption (kWh) information was available for a
2 particular month. Also assume that demand (kW) was missing and needed to
3 be estimated. In calculating the demand estimate in this hypothetical, the old
4 CIS would first calculate the load factor for the two previous months of the
5 same year and the same month a year ago.

6 In determining the Load Factor, the old CIS used the following formula:

7
$$\text{Load Factor} = \frac{\text{kWh}}{\text{kW} \times \text{No. of Read Days} \times 24 \text{ Hours}}$$

8
9 The second step in the calculation using the old CIS estimating method was to
10 calculate the Average Load Factor for the three known data points; i.e., the
11 previous two months of the same year and the same month in the previous
12 year.

13 Once this was done, the Average Load Factor was inserted in a formula to
14 compute estimated demand.

15
$$\text{Est. kW} = \frac{\text{kWh}}{\text{Avg. Load Factor} \times \text{No. of Read Days} \times 24 \text{ Hours}}$$

16
17 Old CIS calculated estimated demand based on the application of average
18 customer load factor for the previous two months and for the same month of
19 the last year to the customer's energy, except where such data did not exist. In
20 these latter instances, APS bill representatives would look to demands of
21 similarly situated customers, for example, neighbors.

1 **Q. WERE THE ESTIMATING PROCEDURES USED BY APS UNDER**
2 **OLD CIS KNOWN TO THE COMMISSION?**

3 A. The estimating procedures used by the old CIS were well known to the ACC
4 and were addressed and applied by the ACC in several written orders prior to
5 1998, including a detailed order dated December 10, 1996 in Docket No. U-
6 1345-96-162 (*Ciccone v. Arizona Public Service Co.*) (“[W]e find 8.9 kW to be
7 the appropriate demand estimate for the September 1995 bill because it is
8 based on APS’ estimation model which considers such factors as Mr. Ciccone’s
9 actual kWh used in September 1995, his previous months’ demands, and the
10 peak demand of other customers with similar kWh usage.”).

11 **Q. PLEASE DESCRIBE THE ESTIMATION METHODS USED WHEN**
12 **THE NEW CIS WAS INSTALLED IN THE FALL OF 1998.**

13 A. As noted in APS witness McLeod’s testimony, the Company had to replace
14 “old” CIS to accommodate retail access. Under the new system, energy
15 consumption was estimated using the customer’s average consumption for the
16 previous 6 months of the same season. This procedure had been embedded in
17 the software of the new CIS. When initially installed, new CIS did not have the
18 capability to automatically estimate demand. If demand information was not
19 available, CIS generated a billing exception report and a billing representative
20 manually calculated the demand estimate.

21 **Q. PLEASE DESCRIBE THE REFINEMENTS TO THE NEW CIS**
22 **ESTIMATION PROCEDURE THAT WERE IMPLEMENTED IN THE**
23 **SPRING OF 1999.**

24 A. By April of 1999, new CIS was programmed so that it could estimate demand
25 (kW) as well as consumption (kWh). The energy consumption estimation
26 formula was unchanged. The new CIS was programmed to estimate demand
using the same general methodology as old CIS; i.e., a load factor based
methodology. The load factor was calculated using an average figure based on

1 all customers in that particular rate class in lieu of individual customer load
2 factors. APS believes that the consistent application of average class load
3 factor to the customer's estimated energy provides a reasonable and fair
4 demand estimate when used in conjunction with the kWh estimate using
5 customer-specific data. Historical load factor information for an individual
6 customer is sometimes not available or is subject to anomalies due to the fact
7 that the prior months' load factor or the prior years' load factor for that
8 customer may have been impacted by a customer absence (such as a vacation)
9 or a special event (such as a party) that produced unusual swings in energy
10 usage or demand. The load factor was calculated using an average figure based
11 on all customers in a particular rate class plus a "generosity factor" of
12 approximately 10%. The load factor used for customers on Schedule EC-1 was
13 45%, 50% for Schedule ECT-1R customers and 60% for Schedule E-32.

13 **Q. PLEASE DESCRIBE THE REFINEMENTS TO THE NEW CIS**
14 **ESTIMATION PROCEDURE THAT WERE IMPLEMENTED IN 2002.**

15 **A.** In August 2002, the class average load factors were changed in the demand
16 estimating methodology to better reflect the most current load research data
17 and eliminate the artificial "generosity factor." For Schedules EC-1, ECT-1R
18 and E-32, a three-year average load factor was calculated based on load
19 research data. This analysis resulted in changing the load factor for demand
20 estimation purposes to 35% for Schedules EC-1 and ECT-1R, and to 50% for
21 Schedule E-32.

22 **Q. WHY DID APS CHANGE THE LOAD FACTOR INPUTS TO ITS**
23 **DEMAND ESTIMATION PROCESS?**

24 **A.** The additional liberal "generosity factor" virtually guaranteed that demand
25 would be underestimated in the absence of a valid meter read, something that
26 our billing representatives noticed repeatedly. This was inconsistent with the

1 Company's general goal of providing as reasonably accurate an estimate to our
2 customers of their usage as practicable.

3 **Q. PLEASE DESCRIBE THE REFINEMENTS TO THE NEW CIS**
4 **ESTIMATION PROCEDURE THAT WERE IMPLEMENTED IN 2004.**

5 A. In 2004, a further refinement to the estimating methodology was implemented
6 that impacted only Schedule ECT-1R. Schedule ECT-1R is a time
7 differentiated rate under which the residential customer is billed on maximum
8 demand that occurs during the on-peak hours of 9:00 AM to 9:00 PM.
9 Therefore, the estimation method should be based on the customer's load
10 factor only during these on-peak hours. This analysis resulted in changing the
11 load factor for demand estimation purposes to 42% for ECT-1R, which
12 represented the average on-peak load factor for ECT-1R customers. The
13 original new CIS programming for estimating kW for ECT-1R also included
14 two additional errors that affected the ECT-1R demand calculation, and these
15 errors were corrected in 2004. First, the program utilized 13 hours for the daily
16 on-peak period rather than 12. The 13 hour on-peak period was a hold over
17 from a rate no longer offered by APS. The second error was the use of 7 days
18 per week in lieu of the 5 days per week during which the on-peak billing
19 component applies. If you will recall the formula I described earlier, days and
20 hours are in the denominator. Thus, both of these errors were actually to the
21 customers' benefit because the computation created a lower estimated demand.

22 **Q. IN YOUR OPINION, ARE THE PROCEDURES USED TO ESTIMATE**
23 **READS UNDER THE OLD CIS AND NEW CIS ESSENTIALLY THE**
24 **SAME?**

25 A. Yes. Although APS has refined the inputs used to provide estimates on bills to
26 simplify and to better computerize the process, the basic method used to
estimate consumption and demand is essentially the same under the old CIS
and the new CIS. The new CIS estimates demand—which was also done by the

1 old CIS—using available customer consumption (kWh) information, the time
2 component and a specified load factor.

3 **Q. YOU PREVIOUSLY INDICATED THAT THE CHANGES IN THE**
4 **DATA INPUTS TO THE DEMAND ESTIMATION PROCESS WERE**
5 **NEEDED TO AVOID CHRONIC UNDERESTIMATION OF DEMAND**
6 **AND IMPROVE THE ACCURACY OF THE ESTIMATES. ARE**
7 **THERE OTHER REASONS TO MODIFY THE LOAD FACTOR AND**
8 **OTHER INPUTS TO THE DEMAND ESTIMATION EQUATION?**

9 A. Yes, although I believe the above reasons would, standing alone, be
10 compelling justifications for the Company's actions. Moreover, I will reiterate
11 that we are really only talking about the changes to the load factor made in late
12 2002. The April 2004 changes were, frankly, to correct errors in our estimation
13 of on-peak demand for ECT-1R. These errors were in large part off-setting; but
14 if we had retained the artificially high load factors used from 1999 through
15 most of 2002, we would have been providing an incentive for customers to
16 prevent meter access once they realized that the demand estimates were
17 consistently below what they were during months APS was able to read the
18 meter. Also, it is possible that these underestimates of demand, had they ever
19 become more prevalent than the miniscule percentage they were, could have
20 distorted the class billing determinants used to both apportion revenue
21 requirements and influence rate design.

22 **Q. SPECIFICALLY, HOW DOES APS ESTIMATE FOR ALL ACTIVE**
23 **ACCOUNTS, INCLUDING INITIAL AND FINAL BILLS?**

24 A. APS uses essentially the same method but uses data inputs that reflect the
25 particular situation. For example, the estimation of energy consumption for a
26 customer on a time differentiated rate recognizes the need to estimate on-peak
and off-peak consumption while the process for estimating energy
consumption for a non-time differentiated rate examines total consumption.

1 **Schedule DJR-1** to my testimony provides descriptions for the range of
2 estimating situations.

3 **Q. DOES APS APPLY ALTERNATIVE ESTIMATION PROCEDURES**
4 **IN CASES OF ENERGY DIVERSION?**

5 A. Yes. Energy diversion requires more in-depth analysis because of the extended
6 length of time that the usage must be estimated, the lack of reliable customer
7 history and the fact that energy diversion sometimes involves only a part of the
8 customer's usage. APS has specific techniques to estimate consumption when
9 diversion occurs. These techniques are discussed in depth in **Schedule DJR-1**.
10 These procedures have been reviewed and approved in many Commission
11 proceedings extending back 20 years.

12 **Q. HOW DOES APS ESTIMATE IF A METER FAILS?**

13 1. Complete meter failure ("dead" meters). Occasionally an actual meter read
14 will indicate very little or no energy usage, and CIS will generate a billing
15 exception. A billing representative will compare the low or zero consumption
16 to the customer history. If a billing representative suspects that the meter is no
17 longer working, the representative will attempt to determine if there is any
18 activity at the site. The representative will request a field check to determine
19 whether the meter has failed or the site is vacant and using no energy.

20 When a meter has failed, the usage is estimated by applying the methods
21 described in **Schedule DJR-1** or by applying the actual per day usage (less
22 three percent) of the new replacement meter, whichever is lower. When the
23 new meter period usage is the basis for the estimate, APS adjusts for the
24 typical differences in weather-related usage between the new meter month and
25 the failed meter period.

1 utilities, they neither affected estimation procedures then in use by APS nor
2 became legally effective in any event.

3 **Q. HAS ANY OTHER INCUMBENT ELECTRIC UTILITY HAD ITS**
4 **ESTIMATION PROCEDURES APPROVED BY THE COMMISSION**
5 **SINCE 1999?**

6 A. Not to my knowledge, and this also supports the Company's interpretation of
7 these Commission rules. It seems inconceivable to me that the Commission
8 would create a rule that put every existing electric utility in violation of a rule
9 on day one and then not say anything about such violation to any of these
10 utilities for nearly six years.

11 **Q. WHY DOES APS BELIEVE THAT THE COMMISSION DID NOT**
12 **INTEND TO APPLY AMENDED RULE 210 TO INCUMBANT**
13 **UTILITIES?**

14 A. It was logical for the Commission to adopt amended Rule 210 and Rule 1612
15 to bring uniformity to the estimating procedures used by a large number of
16 competitive ESPs who might be serving direct access customers within a single
17 service area, but those events never materialized, and the Director of the
18 Utilities Division never promulgated the procedures for establishing approval
19 of estimating practices relating to direct access customers. In contrast, under
20 the historical electric competition model in Arizona, there potentially could be
21 different sets of estimation practices within different service territories.
22 Theoretically, each competitive meter reading service provider could have
23 different estimation practices depending on the circumstances. During the
24 promulgation of the amendments to Rule 210 and the enactment of Rule 1612,
25 APS was unaware of any Commission or Commission Staff intent to
26 automatically invalidate the historical estimating procedures of incumbent
utilities without first providing a workable and established mechanism for APS
to issue estimated bills when circumstances dictated that it do so. For these

1 reasons, APS disagreed with the contentions of the Complainant that APS' bill
2 estimation procedures were automatically invalidated as of January 1, 1999,
3 and APS asked in its Application for Declaratory Order that the Commission
4 clarify its position regarding Rules 210A(5)(a) and 1612.

5 Both the amended language to Rule 210 and the addition of Rule 1612's
6 language were responses to the Commission's decision to open up metering
7 and billing for electric service to competition from competitive ESPs. The
8 competitive model raised the prospect of having multiple metering and billing
9 entities within APS' service territory, as well as having two different billing
10 entities for the same customer. I believe the Commission adopted Amended
11 Rule 210 and Rule 1612 to bring uniformity to bill estimating procedures used
12 by these different entities.

13 A review of the Commission's rulemaking docket, the comments filed by the
14 numerous parties, and the Commission's own description of the Electric
15 Competition Rules reveal no intent to change the historic treatment of
16 estimated billing for Standard Offer customers, i.e., those served entirely by
17 their incumbent utility. Neither did it establish any procedure for such utilities
18 to secure approval of their billing estimation procedures, even though such
19 procedures had been and were clearly in place and being applied on a daily
20 basis by incumbent utilities such as APS, which were serving literally hundreds
21 of thousands of existing customers. Also, as noted earlier, the only document
22 issued by the Commission's Utilities Division Director under the provisions of
23 Rule 1612 and that satisfies the requirements of Rule 210 pertains almost
24 exclusively to direct access customers. Thus, the most reasonable and logical
25 interpretation must be that the provisions of those rules discussed herein do not
26 apply to APS Standard Offer customers.

1 To the extent that the Commission does interpret amended Rule 210 and
2 Rule 1612 as applying to Standard Offer customers, there is still the critical
3 issue of timing. Neither of these rules is self-executing, in that both require
4 some subsequent Commission action, whether by the Commission itself or
5 through its designee. Yet, as noted above, each of Arizona's affected utilities,
6 including APS, already had bill estimation procedures in place and, at least in
7 the case of APS, routinely had presented those procedures to Staff and the
8 Commission in various informal and formal complaint proceedings over the
9 years. It is simply unreasonable to now assume, as suggested by Complainant
10 and her attorneys, that the entire process of rendering estimated bills was to
11 totally and immediately cease until such time, if ever, as the Commission or its
12 Utilities Division Director acted either to establish new procedures for existing
13 and continuing Standard Offer customers or to re-validate any then existing
14 estimating procedures. This would fly in the face of the Commission's repeated
15 statements that billing customers for their usage is a Constitutional and
16 statutory obligation of the utility that cannot be abrogated by a damaged or
17 inaccessible meter. A far more compelling interpretation is that those
18 incumbent utilities already utilizing estimation procedures within their service
19 areas that were lawfully in effect prior to the adoption of amended Rule 210
20 and Rule 1612 could continue to use those procedures and to refine such
21 procedures until such time as the Director issued new and different "operating
22 procedures" under Rule 1612.

21 **Q. DOES APS' ESTIMATING METHOD COMPLY WITH R2-210A(2)?**

22 **A.** Yes. R2-210a(2) provides that, in making an estimate of "consumption"
23 (kWh), a utility should "giv[e] consideration [to] the following factors where
24 applicable: (a) the customer's usage during the same month of the previous
25 year, and (b) the amount of usage during the preceding month." (Emphasis
26

1 supplied.) This particular provision of rule 210 was not amended with the
2 adoption of the electric competition rules. APS does now consider and
3 historically has considered individual customer data in estimating kWh usage.
4 But APS also believes that the permissive language of Rule 210A(2) allows
5 APS to use (and certainly does not prohibit APS from using) estimation factors
6 in addition to usage during the same month of the previous year and the usage
7 from the preceding month of the same year, and it does not compel APS to
8 even "consider" these two months' data when it is not "applicable."

9 Rule 210A(2) says nothing about factors to be considered in estimating
10 **demand** (kW). Because the formula for estimating demand is more complex
11 and subject to more variables than an estimate of consumption (kWh), it is
12 more likely to be subject to refinement and modification based on changing
13 customer data and other periodic research and analysis. The application of
14 class average load factor to the customer's individual kWh consumption that
15 APS implemented beginning in the spring of 1999 is just such an example. The
16 use of a class average load factor does not bias the estimated demands and
17 appropriately scales the demand to the estimated energy by avoiding customer-
18 specific anomalies that may produce significant distortions in the estimated
19 demand.

20 Even if Rule 210A(2) were to apply to estimations of demand, APS' current
21 and past estimates of customer demand use the individual customer's previous
22 month's kWh and the same month of the previous year's kWh, where
23 applicable, as part of the formula to estimate demand. Thus individual
24 customer data is appropriately considered.
25
26

1 Q. **DOES APS COMPLY WITH THE REQUIREMENTS OF A.A.C. R14-2-210A(4)?**

2 A. Yes. Since before 1998, A.A.C. R14-2-210A(4) has required that, after the
3 third consecutive month of estimating the customer's bill due to lack of meter
4 access, the utility should attempt to secure an accurate reading of the meter.
5 APS has always complied with that requirement.

6
7 Nothing in A.A.C. R14-2-210A(4) prohibits a utility from continuing to send
8 the customer estimated bills if access to the customer's meter cannot be
9 obtained. Indeed, the alternative of immediately terminating electric service
10 would be far more disruptive and expensive for the customer.

11 The process described above is precisely what APS attempts to do -- secure an
12 accurate reading of the meter -- each month that a bill is estimated, both before
13 and after the third month. Indeed, where meter access issues require a bill to be
14 estimated, the customer is better off receiving an estimated bill than having
15 service terminated. For this reason, APS seeks to minimize disruption and
16 inconvenience for the customer even when APS has the right to terminate the
17 customer's electric service due to the customer's repeated refusal to provide
18 meter access.

19 **VI. IMPACT OF BILL ESTIMATION**

20 Q. **HAS APS PERFORMED ANY ANALYSES ON THE VARIOUS ESTIMATING
21 METHODOLOGIES THAT IT HAS USED SINCE 1998?**

22 A. Yes, we prepared such analyses.

23 Q. **PLEASE DESCRIBE THE METHODOLGY USED IN YOUR
24 ANALYSES.**

25 A. For the analysis of estimating procedures, APS examined the impact of the
26 procedures on a sample of customers who received service under Schedules E-

1 10, E-12, EC-1, ECT-1R, ET-1 and E-32. Although most of the controversy in
2 this proceeding focuses on demand estimating issues, we included Schedules
3 E-10 and E-12, which are residential rates that do not contain explicit demand
4 charges, so that we could assess the changes that occurred in the estimating
5 process when new CIS was implemented. The listed rates were selected
6 because they represent the rate schedules under which the vast majority of APS
7 customers receive service. For each of these rates, statistically valid samples of
8 100 accounts were randomly selected by computer. The selected accounts had
9 to meet the following conditions:

- 10 1. same customer for the most recent 24 month period ended August
11 2004;
- 12 2. same rate for the selected time period; and
- 13 3. no estimated bills during the selected time period.

14 Once the accounts were selected, each account was "billed" for the 12 months
15 ended August 2004, on their actual kWh and, if applicable, kW. Next, each
16 account had kWh and, if applicable, kW estimated for each of the 12 months
17 using each of the estimating methodologies used since 1998. Next, they were
18 "billed" on the estimated usage. A comparison was then made to determine the
19 difference between the bill using actual kWh and kW and estimated kWh and
20 kW.

21 Finally, using the number of actual bills which were estimated for each of these
22 rates for the 12 months ended August 2004, the results of the sample analyses
23 were projected over the total number of active services that were billed on each
24 of the rates for the same twelve month period.

25 **Q. WHICH ESTIMATING PROCEDURES WERE USED IN YOUR ANALYSIS?**

26 **A.** We used the following procedures:

1. "Old CIS" methodology
2. Commission-approved rate schedule provisions for estimating kW for EC-1 and ECT-1R
3. March 1999 new CIS estimating methodology
4. 2002 modification to new CIS estimating methodology
5. 2004 CIS estimating methodology

7 **Q. ARE THESE THE SAME PROCEDURES THAT YOU PREVIOUSLY**
8 **DESCRIBED IN YOU TESTIMONY?**

9 A. Four of the five were previously discussed. The additional methodology
10 reflects an estimating procedure that is found on the tariff sheets for Rate
11 Schedules EC-1 and ECT-1R. Since the inception of these rates in the early
12 1980's, these rate schedules have contained provisions that indicate that if a
13 meter was inaccessible due to a locked gate or safety limitations, the kW to be
14 used for billing was to be the last read and reset of kW. The provisions on the
15 rate sheet were arguably more narrow in their intended application and are a
16 hold over from the very early days of APS offering residential demand rates in
17 order to meet PURPA requirements. The estimating methodology described in
18 the rate schedules has never been implemented, to the best of my knowledge.
19 In fact, the tariff language provides perverse incentives to customers to deny
20 APS access. For example, a customer could deny access to APS during the
21 hottest months of the summer and would be billed on the last demand reading
22 that may have occurred before high use periods began.

22 **Q. HOW MANY ESTIMATES WERE USED IN YOUR ANALYSES?**

23 A. The following table lists the number of bills that were estimated for the 12
24 months ending August 2004 and expresses that number as a percentage of the
25 number of services billed.
26

Rate Schedule	Number of Estimated Bills	% of Bills Estimated
E-10	18,931	1.78%
E-12	62,090	1.32%
EC-1	2,053	0.32%
ECT-1R	4,797	0.90%
ET-1	35,933	0.99%
E-32	21,452	1.88%

9 **Q. PLEASE SUMMARIZE THE RESULTS OF YOUR ANALYSES.**

10 A. Under each of the estimating methodologies, the net effect is that APS under
11 bills customers whose usage is estimated. A detailed listing is attached to my
12 testimony (**Schedule DJR-2**) and is summarized below:

- 13 1. Under the Old CIS estimating routine, the net projected under billing
14 was \$605,330.
- 15 2. Under the rate sheet provisions for EC-1 and ECT-1R, the net projected
16 under billing was \$433,211.
- 17 3. Under the March 1999 new CIS methodology, the net projected under
18 billing was \$820,008.
- 19 4. Under the October 2002 methodology, the net projected under billing
20 was \$513,854.
- 21 5. Under the 2004 methodology, which is still in place today, the net
22 projected under billing is \$432,293.

23 **Q. CAN YOU EXPLAIN WHY THE PROJECTED UNDERBILLING WAS SIGNIFICANTLY HIGHER UNDER THE MARCH 1999 METHODOLOGY?**

24 A. Yes. It is largely a function of the liberal "generosity factor" that was added to
25 the class average load factor. For example, while the class average for
26 Schedule EC-1 was approximately 35%, a factor of 45% was programmed into

1 the CIS. Since a higher load factor results in a lower estimated kW, and we
2 were using a load factor higher than the average, many of our demand
3 estimates under this methodology were too low, which results in a greater
4 under billing. The other class load factors used from 1999 to 2002 were
5 similarly inflated and demands were similarly under-estimated.

6 **Q. SCHEDULE DJR-2 INDICATED AN UNDERBILLING OF E-10, E-12,
AND ET-1. HOW CAN THIS OCURR?**

7 A. E-10, E-12 and ET-1 do not have demand charges. An estimated kWh usage
8 will be, in essence, "trued up" when an actual meter read is obtained. However,
9 E-10 and E-12 are blocked (i.e., the per kWh charge is different for varying
10 blocks of consumption) and also seasonally differentiated (summer rates higher
11 than winter). This also affects the billing impact of kWh estimates for the
12 demand rates (EC-1, ECT-1R and E-32), albeit to a lesser extent. ET-1 is not
13 blocked, but it has both diurnally (peak/off-peak) and seasonally differentiated
14 kWh charges. Thus, how kWh are, in a sense, "allocated" by the estimation
15 process can affect bills. Over a large enough sample, these impacts should
16 balance out. The fact that we are showing chronic net underbilling of kWh
17 leads me to believe there is some downward bias in our process that we have
18 yet to determine.

19 **Q. DID YOU PERFORM ANY ANALYSIS TO DETERMINE THE
NUMBER OF BILLS THAT WERE IMPACTED BY THE CHANGES
20 TO THE DEMAND ESTIMATING BETWEEN THE RATE SHEET
PROVISIONS, THE MARCH 1999 PROCEDURE, AND THE
21 OCTOBER 2002 PROCEDURE?**

22 A. Yes. For the customers in our sample, we compared the bills based on actual
23 consumption with each demand estimation methodology to determine how
24 many bills would have been higher or lower had the estimation methodology
25 been applied. The comparison is found in the table below. For example, for the
26 EC-1 customer sample, under the August 2002 methodology 514 bills would

1 have had estimated demands higher than actual demands and 662 bills would
 2 have had demands lower than actual. In each case, the estimating formula also
 3 yielded some estimates that exactly matched actual meter readings. Therefore,
 4 the total number of bills that are higher or lower than actual may be less than
 5 1200 (100 customers for 12 months) in any example.

Rate	Rate Schedule		March 1999		August 2002	
	Methodology		Methodology		Methodology	
	No. of Bills Higher than Actual	No. of Bills Lower than Actual	No. of Bills Higher than Actual	No. of Bills Lower than Actual	No. of Bills Higher than Actual	No. of Bills Lower than Actual
EC-1	579	544	197	987	514	662
ECT- 1R	598	562	16	1182	221	969
E-32	n/a	n/a	66	740	135	665

17 **Q. DID YOU PERFORM A SIMILAR ANALYSIS TO EXAMINE THE**
 18 **IMPACT OF THE CHANGE IN THE ENERGY ESTIMATING**
 19 **PROCEDURE?**

20 **A.** Yes, we did. As explained earlier in my testimony, the only change in the
 21 energy estimating procedure occurred when we moved from old CIS to new
 22 CIS. For the customers in our sample, we compared the bills based on actual
 23 consumption with each of the two energy estimation procedures to determine
 24 how many bills would have been higher or lower had the estimation procedure
 25 been applied. Note that, although there are slightly more overbills of E-10 and
 26

1 E-12 than underbills, the net impact as shown on **Schedule DJR-2** is still an
 2 underbilling under both old and new CIS formulas.
 3

Rate	Old CIS		New CIS	
	No. of Bills Higher than Actual	No. of Bills Lower than Actual	No. of Bills Higher than Actual	No. of Bills Lower than Actual
E-10	568	625	631	566
E-12	579	614	598	591
EC-1	563	637	573	627
ECT-1R	558	642	539	661
ET-1	518	618	555	645
E-32	552	643	550	644

18 VII. CONCLUSION

19
 20 **Q. DO YOU HAVE ANY CONCLUDING REMARKS?**

21 **A.** Yes. First, it is my belief that the estimating procedures that APS has in place
 22 today and has used in the past are reasonable approaches to solving a problem
 23 that faces every utility that meters usage, whether electric, gas or water. As the
 24 analyses we performed indicate, our estimating procedures are reasonably
 25 accurate and certainly do not present any financial windfall to the Company. In
 26 fact, the procedures, on the average, favor the customer. The reality is that

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26

estimation procedures work exactly as intended: they produce estimates. Any single customer might receive favorable treatment by any single estimation procedure, but the larger question is whether the procedures are reasonable from an overall perspective. I believe that APS' procedures are reasonable and are in accordance with applicable Commission rules.

Q. DOES THIS CONCLUDE YOUR PREFILED TESTIMONY IN THIS PROCEEDING?

A. Yes.

Appendix A
Statement of Qualifications
David J. Rumolo

David J. Rumolo is Arizona Public Service Company's Manager of Pricing and Regulation. He has over 30 years experience in the electric utility business as a consultant and utility professional. Mr. Rumolo holds Bachelor of Science Degrees in Electrical Engineering and Business (Finance as an area of emphasis) from the University of Colorado. He is a registered professional engineer in the states of Arizona, California, Colorado, and New Mexico.

Mr. Rumolo's areas of expertise include utility rate design; embedded and marginal cost analysis; formulation of utility service policies; contract development and negotiation; utility valuation analyses; and evaluation of utility revenue requirements. Mr. Rumolo has testified on utility matters before state regulatory bodies in the states of Arizona, Colorado, Florida, and Wyoming and before judicial bodies in the states of Arizona and California. Mr. Rumolo is also experienced in the many aspects of electric utility planning and design including preparation of long range resource plans; transmission and distribution system long range planning; system protection analyses; and reliability assessments.

Mr. Rumolo has been in the pricing and regulation area of Arizona Public Service Company for approximately four years. Prior to assuming that position, he served as the Manager of Transmission and Market Structure Assessment for Pinnacle West Energy Corporation ("PWEC"). Before joining PWEC, Mr. Rumolo had a 15-year career as a consultant with Resource Management International, Inc., where he provided utility rate and engineering consulting services to utility clients across the United States and overseas. He began his career providing consulting services to utility clients when he joined the firm of Miner and Miner Consulting Engineers in Greeley, Colorado where he became the Manager of Planning and Rates. He later became a partner in Electrical Systems

Consultants where he focused on cost of service and rate analyses, as well as transmission and distribution planning.

ESTIMATION METHODS

1. ESTIMATING ENERGY USAGE (kWh)

a. Existing Meter With Account History

These situations usually occur because a customer has not provided APS personnel safe and unassisted access to the meter to obtain a read. When there is energy usage history available for the site, the Customer Information System ("CIS") or a Billing Associate will estimate the kWh usage (both total monthly usage and time-of-use usage when applicable) using one or more of the following three methodologies.

i. Seasonal Average Method. This method 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 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. The months in the two billing seasons are:

<u>Season</u>	<u>Billing Months</u>
Winter	November-April
Summer	May-October

Then, using the seasonal account history, CIS or a Billing Associate will follow these steps:

- 1) Total the number of days from each of the previous six months for the appropriate season to yield Seasonal Total Days.
- 2) Total the kWh from each of the previous six months for the appropriate season to yield the Seasonal Total kWh.
- 3) Divide Seasonal Total kWh by Seasonal Total Days to yield the Seasonal Per Day Usage.
- 4) Multiply the Seasonal Per Day Usage by the number of days in the missing-read billing period to yield the kWh for the missing-read billing period.

Example of Seasonal Per Day Calculation

Assume the missing-read month is July 2003 (a summer month) and that there are 32 days in the billing period. Thus, the appropriate seasonal energy is from the six summer months of the previous year. For this example:

Month	Usage	DAYS
July 2002	1,796	31
Aug 2002	2,098	29
Sep 2002	1,919	31
Oct 2002	1,629	28
May 2003	995	30
June 2003	1,532	29
Totals	9,969	178

Total Seasonal Usage = 9,969 kWh

Total Seasonal Days = 178 days

Missing-read Period = 32 days

Therefore:

$$9,969 / 178 = 56.01 \text{ kWh per day}$$

$$56.01 \times 32 = 1,792 \text{ kWh}$$

Estimated consumption for July is 1,792 kWh.

ii. Previous Month Method. 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.

The steps in this method are as follows:

- 1) Retrieve from CIS the customer's usage and the number of days in the previous month.
- 2) Divide the previous month's usage by the number of days in the previous month to yield the per day usage.
- 3) Multiply the previous month's per day usage by the number of days in the missing-read billing period.

Example of Previous Month Per Day Calculation

Assume the missing-read month is January and the January billing period contains 32 days. For this example:

$$\text{December usage} = 2,369$$

$$\text{December number of days} = 27$$

$$\text{January number of days} = 32$$

$$2,369 / 27 = 87.74 \text{ kWh per day previous month}$$

$$87.74 \times 32 = 2,807 \text{ kWh for the missing-read month}$$

January estimated usage is 2,807 kWh.

iii. 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 is in a different season than the missing-read month. This method is identical to the Previous Month Usage Method (see ¶ A.1.ii. above), except that usage and number of days from the same month in the previous year is 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.

iv. Time-of-Use Energy Allocation without Account History. If the account is currently on a time-of-use service plan, but was not on time-of-use a year ago, the estimated usage is allocated to on-peak and off-peak based on the class average split for on-peak and off-peak energy.

Example of Same Month Previous Year Method, Time-of-Use Service Plan

Assume the same estimated energy in the previous example. The class average energy split for a time-of-use service plan in the summer months is 40% on-peak and 60% off-peak, and in the winter months it is 30% on-peak and 70% off-peak. Using these averages, the on-peak and off-peak energy calculations for this example are as follows:

Summer Month	<u>Total</u>	<u>40% On-Peak</u>	<u>60% Off-Peak</u>
	2,807 kWh	1,123	1,684
Winter Month	<u>Total</u>	<u>30% On-Peak</u>	<u>70% Off-Peak</u>
	2,807 kWh	842	1,965

b. New Meter Set Without Account History

This method is used when APS is unable to obtain a meter read at the first read of a new account. When this occurs, CIS flags the account as an “exception”

and the account is routed to a Billing Associate, who estimates the usage as follows:

i. If the number of days between the meter set and read date is less than the established threshold required to estimate usage (currently 10 days), the Billing Associate uses zero usage. Thus, the customer's first bill is only a prorated Basic Service Charge.

ii. If the number of days is greater than the current required threshold, the Billing Associate estimates a read using a "minimum usage estimate" of kWh per day (currently 20 kWh per day) multiplied by the number of days between the original meter set and read date. For those new accounts on a time-of-use rate, the "minimum usage estimate" is split at 40% on-peak during the summer and 30% on-peak during the winter. This is consistent with the methodology described in ¶ A.1.a.iv above. If the new account also has a demand meter, the demand is estimated using the same load factor methodology as mentioned in ¶ A.2 below.

2. ESTIMATING DEMAND (kW)

In general, to estimate a customer's maximum demand without an actual read, CIS or a Billing Associate estimates demand (kW) by applying the applicable time component and the class average load factor to actual or estimated energy usage (kWh). The Billing Associate may also give consideration to the customer's demand during the same month of the previous year or the demand during the preceding month to verify the estimated demand using the average load factor.

a. Time-of-Use Demand Service Plans. For those customers on a time-of-use demand service plan, APS first calculates the estimated on-peak

kWh using the appropriate kWh estimating methodology. APS then calculates the total number of on-peak hours during the missing-read period by multiplying the on-peak hours per day times the estimated number of weekdays in the missing-read billing period. APS next calculates the on-peak demand by dividing the on-peak energy usage by the number of on-peak hours and the time-of-use class average on-peak load factor. Residential demands are estimated and billed to the nearest tenth of a kW. Non-residential demands are estimated and billed to the nearest whole kW.

Example of Estimating Demand for Time-of-Use Service Plan

For this example, assume the following:

Estimated on-peak energy usage = 842 kWh

Number of weekday on-peak hours = 12¹

Number of days in the missing-read billing period = 31

Number of weekdays in the missing-read billing period = $5/7 \times 31 = 22$

Class average on-peak load factor = 42%²

Then:

$22 \times 12 = 264$ on-peak hours

¹ Currently, the monthly on-peak hours for ECT-IR accounts are 12 hours for each weekday. Until April 2004, the monthly on-peak hours were overstated as 13 hours for all days (based on a superceded rate schedule). The use of 13 on-peak hours for all days **understated** the estimated demand compared to the use of 12 on-peak hours for weekdays. This is because the denominator in the demand formula would be larger with the greater number of on-peak hours, thus understating the demand that results from the division of estimated on-peak kWh by the product of on-peak hours and load factor. The Commission decision that approved a 13 hour on-peak time period for all days for ECT-1 was ACC Decision No. 52593. The 12 hour on-peak period for weekdays was approved for ECT-1R in ACC Decision No. 56250.

² 42% is the current average monthly on-peak load factor used to estimate demand for ECT-1R customers.

$$842 / (264 \times 0.42) = 7.6 \text{ kW}$$

The estimated on-peak demand for the missing-read period is 7.6 kW

b. Non-Time-of-Use Demand Service Plans. To estimate demand for the non-time-of-use service plans, APS calculates the kWh usage for the missing-read billing period. APS then calculates the total number of hours in the missing-read billing period by multiplying the number of days by 24. APS calculates the monthly peak demand by dividing the estimated energy usage by the total number of hours figure multiplied by the class average load factor. Residential demands are estimated to the nearest tenth of a kW. Nonresidential demands are estimated and billed to the nearest whole kW.

Example of Estimation Demand for Non-Time-of-Use Service Plan

For this example, assume the following:

Estimated energy usage = 1,160 kWh

Number of days in missing-read billing period = 29

Class average load factor = 35%³

Then:

$29 \times 24 = 696 \text{ hours}$

$1,160 / (696 \times 0.35) = 4.8 \text{ kW}$

The estimated monthly maximum demand is 4.8 kW.

c. Non-Residential Demand Estimates. All non-residential services that must be estimated are calculated using the same methods as the residential methods above, except the average load factors for the respective class of non-residential customers are used in the calculations.

³ Since August 2002, APS has used a 35% average load factor to estimate demand for EC-I customers.

ESTIMATING WHEN ENERGY DIVERSION OCCURS

In instances in which a customer diverts his energy use, one or more of the methods described above may be used to estimate the usage for the period of suspected energy diversion. If there is insufficient usage history because tampering has occurred over an extended period of time, the Degree Day Method may be used.

The Degree Day Method consists of determining the customer's non-weather-sensitive "base load" (as metered during a period that is determined to be free from tampering or diversion) and adding to that usage the estimated usage of the customer's inventory of weather-sensitive appliances, adjusted for actual weather conditions as measured by "degree days."

APS estimates the base load as an average of the electric usage with little or no heating or cooling, which represents a customer's basic electric usage for lighting and non-weather-sensitive appliances, such as washer, dryer, television and refrigerator. April and November are normally base load months requiring minimal heating or cooling.

Next, APS adds to the base load the customer's estimated electrical requirements for heating or cooling needs. APS inventories the customer's weather sensitive equipment, such as evaporative cooler, refrigerated air conditioner, heat pump, heat strips, and gas furnace. Using APS' database of the electric usage of such equipment, APS estimates the customer's electric usage for heating and cooling.

The additional electric usage for heating or cooling is calculated by using temperature information received from the National Weather Service. APS retrieves the historical daily temperature during the back-billing period from

the National Weather Service to calculate the customer's degree days. To determine how many hours of heating or cooling were needed, the high and low temperatures for each day are averaged. In the summer, if the daily average temperature is over 80 degrees, then the difference between the daily average and 80 degrees represents the number of hours needed for cooling to maintain an inside temperature of 80 degrees that day. In the winter, the high and low temperatures are again averaged and if the daily average high temperature is under 65 degrees, then the difference between the daily average temperature and 65 degrees represents the number of hours needed for heating to maintain an inside temperature of 65 degrees that day.

Once the number of heating or cooling hours is determined, the electric usage of the customer-specific equipment to meet that heating or cooling requirement is calculated. APS uses its current engineering estimates for the kW demand for the heating and cooling equipment and multiplies those factors by the actual degree day hours to yield the kWh for both heating and cooling requirements.

Summary of the Degree Day Calculations:

1. Estimate base load using actual averaged data in base load months.
2. Calculate the number of heating or cooling degree day hours for the billing cycle.
3. Multiply customer specific heating and cooling equipment by the appropriate kW factor. The current average electric usage factor is as follows:
 - a. Heat pump heating = 0.771 kW per ton
 - b. Gashace=0.955 kW per hour
 - c. Refrigerated cooling = 1.266 kW per ton
 - d. Evaporative cooling = 0.955 kW per each $\frac{3}{4}$ horse power cooler

4. Multiply the total heating or cooling hours in the billing cycle (calculated in number 2 above) by the total kW (calculated in number 3 above).
5. Add the product from number 4 above to the base load in number 1 above to determine total kWh for the billing cycle.

Example of Bill Estimation for Energy Usage Using Degree Day Method

Assume:

1. An all-electric, 2,000 square foot home with a three-ton heat-pump.
2. November usage for this home is 700 kWh.
3. National Weather Service temperatures in December as shown in the following table:

Day of the Month	Daily High Temp	Daily Low Temp	Average	Inside temperature of 65 degrees – required heating hours per day
December 1	66	50	58	65 – 58 = 7 heating hours
December 2	70	50	60	65 – 60 = 5 heating hours
December 3	78	56	67	65 – 67 = 0 heating hours
***	***	***	***	***
December 31	68	52	60	65 – 60 = 5 heating hours

Assume for this example:

1. December is the billing period
2. Base load = 700 kWh
3. Total heating hours for the billing period = $7 + 5 + 0 + \dots + 5 = 196$ degree hours
4. 3 tons of heating x 0.771 kW per hour per ton = 2.313 kWh per heating degree hour
5. $196 \times 2.313 = 453$ kWh, total heating requirement
6. $700 + 453 = 1,153$ kWh, total estimated usage for the billing period

If it is necessary to estimate demand, the demand is determined as set forth in ¶ A.2 above.

Schedule DJR-2

Summary of Estimation Procedure Revenue Impacts

RATE	NUMBER OF METERS ESTIMATED	NUMBER OF ACTIVE SERVICES BILLED	OLD CIS TOTAL DOLLAR IMPACT	RATE SHEET PROVISIONS TOTAL DOLLAR IMPACT	MARCH 1999 TOTAL DOLLAR IMPACT	AUGUST 2002 TOTAL DOLLAR IMPACT	APRIL 2004 TOTAL DOLLAR IMPACT
E-10	18,391	1,030,798	\$(41,863)		\$(12,196)	\$(12,196)	\$(12,196)
E-12	62,090	4,699,950	\$(252,427)		\$(157,576)	\$(157,576)	\$(157,576)
EC-1	2,053	273,335	\$(4,123)	\$412	\$(32,993)	\$(627)	\$(627)
ECT-1R	4,797	533,316	\$(8,831)	\$(6,768)	\$(179,092)	\$(86,373)	\$(4,811)
ET-1	35,933	3,642,505	\$(103,719)		\$(46,971)	\$(46,971)	\$(46,971)
Total Residential	123,264	10,179,904	\$(410,963)	\$(6,356)	\$(428,828)	\$(303,743)	\$(222,182)
E-32	21,452	1,138,749	\$(194,367)		\$(391,180)	\$(210,111)	\$(210,111)
Total	144,716	11,318,653	\$(605,330)	\$(6,356)	\$(820,008)	\$(513,854)	\$(432,293)

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

TESTIMONY OF TAMMY MCLEOD

On Behalf of Arizona Public Service Company's

Application for Declaratory Order

Docket No. E-01345A-03-0775

November 23, 2004

Table of Contents

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

I. INTRODUCTION..... 1

II. SUMMARY OF TESTIMONY..... 1

III. APS METER READING PROGRAM..... 2

IV. APS' ESTIMATING METHODS 18

V. WHAT IS THE IMPACT ON CONSUMERS OF APS' BILL ESTIMATION
METHOD..... 25

VI. CONCLUSION 27

STATEMENT OF QUALIFICATIONS..... APPENDIX A

NUMBER OF APS METERS (BREAKDOWN)..... SCHEDULE TM-1

METER READER EXPECTATIONS AND
PERFORMANCE MINIMUMS SCHEDULE TM-2

1995 "NO ACCESS" GUIDELINES..... SCHEDULE TM-3

APS "PINK CARD"..... SCHEDULE TM-4

APS "NO ACCESS" DOOR HANGER..... SCHEDULE TM-5

APS "NO ACCESS" DISCONNECT NOTICE SCHEDULE TM-6

APS "ALERT/ALERT" BILL NOTICE SCHEDULE TM-7

APS BILLING EXCEPTION NO. 193 SCHEDULE TM-8

ILLUSTRATIVE BILL WITH ESTIMATED DEMAND..... SCHEDULE TM-9

ILLUSTRATIVE BILL WITH ESIMATED DEMAND SCHEDULE TM-10

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

**TESTIMONY OF TAMMY MCLEOD
ON BEHALF OF ARIZONA PUBLIC SERVICE COMPANY
(Docket No. E-01345A-03-0775)**

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME, ADDRESS AND OCCUPATION.

A. My name is Tammy McLeod. I am the General Manager of Customer Service and Southern Arizona operations for Arizona Public Service Company ("APS" or "Company"). My business address is 2121 W. Cheryl, Phoenix, Arizona. A Statement of Qualifications is attached as Appendix A.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. In connection with the Application for Declaratory Order ("Application") filed by APS with the Commission in October 2003 and amended twice since then to update certain information, my testimony will explain the background facts relating to APS' meter reading practices and bill estimation procedures, and various other matters concerning the Application.

II. SUMMARY OF TESTIMONY

Q. WOULD YOU PLEASE SUMMARIZE YOUR TESTIMONY?

A. APS understands that timely and accurate meter reads are an important part of customer service, which is why we place such an emphasis on meter reading accuracy. Although the Company's goal is to read every meter every month, that goal is, of course, unobtainable for a variety of reasons outside our control. Thus, my testimony includes an overview of APS' meter reading practices so that the Commission will have the benefit of that background in assessing the need for a reasonable resolution of the issues raised by the Company's Application. In this regard, I will discuss in my testimony the number of meter readers used by APS,

1 the process by which meter readers are hired, trained, deployed and evaluated, the
2 reasons for estimates, the procedures and processes used by APS to obtain access
3 to meters and, most importantly, to inform our customers of meter access
4 problems. I will also address the steps taken by APS to ensure that meters are read,
5 the procedures used by APS to make an estimate when an actual read of the meter
6 cannot be obtained, and other related matters.

7 My testimony at this time will not include a detailed response to the claims made
8 by Complainant Avis Read. It is my understanding that the Complainant has the
9 burden to initially provide some evidence to support such claims. If and when that
10 evidence is presented by Complainant, I expect to provide testimony at a later time
11 specifically responding to the Complaint. What I can say now is that, contrary to
12 the claims made in the Complaint that APS systematically and intentionally over
13 bills its customers when a bill must be estimated, APS' analysis shows that its
14 estimation procedures, even as refined and improved in recent years, **tend to**
15 **under bill its customers on average.** APS witness David Rumolo will address
16 this issue separately and in more detail.

17 III. APS METER READING PROGRAM

18 **Q. WHAT IS THE COMPANY'S GOAL IN TERMS OF READING METERS?**

19 **A.** APS' goal is to read every meter every month. It is always in APS' interest to get
20 actual accurate meter reads because when a meter is not read, additional work and
21 costs are created for APS. These include the efforts of billing representatives, the
22 need for meter verifications by field personnel, phone calls and mailings to our
23 customers, and the receipt of additional customer calls to our Call Center.
24
25

1 **Q. WHAT IS THE TOTAL NUMBER OF CUSTOMER METERS IN APS'**
2 **SERVICE TERRITORY?**

3 A. As of October 18, 2004, APS had over 1 million meters installed in the field. Only
4 175,000 or so of these meters are on accounts where customers are being billed on
5 a demand rate (roughly 155,000 for EC-1, ECT-1R and E-32). The number of
6 customer meters broken down by class is outlined in the document attached as
7 **Schedule TM-1.**

8 **Q. HOW DOES APS READ MORE THAN ONE MILLION METERS EVERY**
9 **MONTH?**

10 A. At present APS employs approximately 158 meter readers throughout the State of
11 Arizona to perform this task. These meter readers read the Company's meters over
12 the 21 cycles in a billing month.

13 **Q. HAS THE NUMBER OF APS METERS INCREASED OVER THE YEARS?**

14 A. Yes. APS has employed the following number of meter readers on an annual basis
15 since 1995.
16
17
18
19
20
21
22
23
24
25

Year Ending	Meter Readers ¹
1995	111
1996	121
1997	117
1998	133
1999	136
2000	131 ²
2001	135
2002	139
2003	145
YTD 2004	158

Q. HOW DOES THIS COMPARE WITH APS CUSTOMER GROWTH?

A. The number of APS customers has increased just under 40% since 1995, while meter readers have increased over 42%. I consider this a pretty good match.

¹ APS would also note that in addition to APS "meter readers," APS "Servicemen" and "Troublemens" (these are all IBEW job classifications), as well as Local Reps and other job classifications, may also read meters on occasion, if needed, as part of their service to our customers.

² In 2000, APS implemented DB Microware, which is a software program allowing more efficient meter reading routing. This allowed APS to improve productivity.

1 Q. **DOES APS HAVE ENOUGH METER READERS TO READ ALL OF ITS METERS?**

2 A. Yes. If we did not, this would be reflected by a persistent inability of our meter
3 readers to complete their assigned routes. No such inability exists. In addition, I
4 am sure the IBEW would notify me if it believed additional employees were
5 required because that would mean additional union jobs.

6 Q. **IF APS HAD MORE METER READERS, WOULD THAT ELIMINATE THE NEED TO ISSUE BILLS BASED ON ESTIMATED USAGE?**

7
8 A. No. It would not even reduce the number of such estimates by an appreciable
9 amount, if at all. For example, more meter readers would do nothing to resolve
10 access issues, or to change the weather in the northern part of our service area, or
11 to prevent meters or meter reading equipment from malfunctioning, or to prevent
12 meter tampering.

13 Q. **HOW DOES APS ESTABLISH ITS METER READING ROUTES?**

14 A. APS builds its routes on actual average read time for each meter in the route. A
15 meter reader's standard workday is 8 hours. A daily route assignment is targeted at
16 6 to 6.5 hours read time, allowing for travel time to and from the route, lunches,
17 and breaks, in addition to the meter reading. Routes with added travel to and from
18 headquarters will have a read time of less than 6.5 hours.

19
20 In high growth areas, new routes are split off of established routes as more meters
21 are added into that area. Optimally, each APS meter reading shop operates with a
22 ratio of 18 to 19 routes per meter reader during the 21 cycle work month (APS has
23 21 billing and meter reading cycles per month). This allows the workforce to have
24 earned paid time off, and to manage the commitments to read all of the routes
25 monthly within the established time windows. In cooperation with the IBEW,

1 employees are added, as needed to cover the growth, which is identified through
2 the increase in customers per route.

3 Because geographical differences and meter placement influence the number of
4 meters that can be read, routes are based on time rather than number of meters.
5 Indeed, each meter route has a different number of meters assigned. Some routes
6 have a smaller number of meters to read, such as 100, other routes could have
7 1,000 meters. However, both routes would be completed within a 6 to 6.5 hours
8 read timeframe under normal conditions.

9 **Q. WHAT IS THE AVERAGE NUMBER OF METERS THAT EACH METER
10 READER IS RESPONSIBLE FOR READING PER DAY?**

11 A. The quantity of meters in a route is determined by numerous factors. Geography of
12 the area (i.e., mountain areas), walking distance between meters, dirt roads,
13 driving distance to and from shop headquarters are all elements that impact the
14 number of meters in a route. Density of meters is another critical factor, i.e., a
15 route with numerous multistory apartments will allow for a much greater volume
16 of meters to be read versus a route with subdivision homes, versus a route with
17 homes on acreage, versus a route with a combination of meter distributions.

18 All routes are constructed to enable one day completion by the meter reader. Some
19 routes are also created with growth in mind (such as a new subdivision) and will
20 not be a full day's assignment. Other routes have grown beyond a full day's
21 reading and have to be adjusted. Both of these situations are called "pieces."
22 Pieces will be combined and assigned to a meter reader to become a full day's
23 route assignment until growth or additions to already pieced-out routes become a
24 full route assignment. In high density areas, a meter reader can easily read from
25 400 to 1000 meters a day. In the more rural and low (meter) density areas a meter
reader may read only 100 to 500 meters a day.

1 **Q. COULD YOU BRIEFLY EXPLAIN THE METER READING PROCESS?**

2 A. At its simplest, the meter reader first locates the customer's meter. If it is probable,
3 the meter reader inserts the magnetic probe attached to his or her hand-held meter
4 reading computer (called "Itron"). The read is automatically down-loaded, and the
5 Itron provides both an audio and visual signal that the read has been successful. If
6 the meter is not probable, or if the probe will not download the read, the meter
7 reader will type in the read on the Itron. Should the typed-in read not be consistent
8 with the prior month's read (e.g., it was less than the last reading), the Itron will
9 reject the read and ask the meter reader to check both the read and the meter ID
10 number again (in the latter instance, the read may be accurate, but for the wrong
11 meter). When the read is typed in because of probe or meter failure, the meter
12 reader will note that problem in his log so that the probe/meter can be checked or
13 replaced when the meter reader returns to the office. Finally, the meter readers will
14 manually reset the demand reading to zero, assuming either that the probe did not
15 do so automatically or the meter was non-probable. The meter reader then moves
16 on to the next service location.

17 **Q. WHAT ARE THE INITIAL STEPS IN HIRING AND TRAINING AN APS
18 METER READER?**

19 A. A candidate list is maintained by IBEW Local 387. The candidates put their names
20 on the list and once the IBEW's list is exhausted, the "book" is opened and a new
21 list started. APS screens the candidates provided by the IBEW by having a panel
22 interview them. Each interview is approximately an hour long and includes
23 situational questions and questions about prior work experience. For example,
24 candidates are specifically asked about past experience (good and bad) with dogs
25 and other factors such as attitude towards working out of doors that may affect
their ability to be productive meter readers.

1 Candidates who pass the interview attend up to a full day's presentation about
2 meter reading, learn the basics of meter reading, read a mock route and take a
3 screening test. This is an opportunity for the candidate to see the realities of the
4 job, its physical nature, and the expectations of types of meter reading and
5 quantities of meters to be read. APS emphasizes that it expects a meter reader to
6 always attempt to read every meter unless there is an unsafe condition. A
7 background check is also done on all candidates. Candidates that pass these stages
8 advance to the hiring pool where they are eligible to be meter reader trainees.

9 **Q. WHAT ARE THE NEXT STEPS?**

10 A. Meter reader trainees begin training with a meter reader trainer. The training
11 schedule outline is as follows:

- 12 • Day 1--Issue supplies, including scopes, shirts, keys, hats, dog stick,
13 and seal bag; introduction to crew and facilities; shadow a veteran
14 meter reader.
- 15 • Day 2--Discuss meter reader manual; practice reading pictures of
16 real meters (PowerPoint presentation, or slides); and master level
17 one of the Meter-pro ® meter reading software program.
- 18 • Day 3--Master level two and three of the Meter-pro ®; practice
19 reading pictures of real meters; hand-held computer (Itron) training
20 on the training route.
- 21 • Day 4--Half-day in field with trainer with a partial route, including
22 scoping practice; additional level two and three Meter Pro ® and
23 scope practice at the APS yard.
24
25

- 1 • Day 5--Work in field with veteran meter reader shadowing trainee;
2 final meter reading test and check list completion.
- 3 • Second week--Split routes and solo with spot checks from trainer;
4 work up to full route with additional help (as needed per individual).

5
6 **Q. ONCE AN APS METER READER IS HIRED, HOW DOES APS
EVALUATE THAT METER READER'S PERFORMANCE?**

7
8 A. APS uses progress reports to gauge newly-hired meter readers at the 30/60/90-day
9 and six-month milestones. The progress reports evaluate attendance, safety,
10 performance, conduct, and working flexibility. A team leader will meet with a
11 new-hire and provide specific instances of customer complaints or customer
12 compliments, along with statistical performance data, and therefore is able to
understand how the trainee is progressing.

13 In addition, APS has now developed a "Training Card," which will be utilized to
14 get training feedback on the last two classes of trainees. The purpose of the Meter
15 Reading Training Grade Card is to benchmark the trainees once they leave the
16 training shop. This allows a veteran meter reader to evaluate a newly-hired from a
17 new perspective. The Grade Card, with the evaluator input, will show areas in
18 which the trainee needs further training, or confirm that the trainee has a firm
19 grasp of the concepts that have been taught. Each trainee is different with regards
20 to the rate at which he or she grasps and masters the concepts of meter reading.
21 Once the training shop is confident that the trainee is ready to be released to his or
22 her new home shop, the Grade Card will come into play, with the aid of the new
23 home shop evaluator. It is anticipated that all trainees will be evaluated near the
24 six-month mark. If it is discovered that a trainee has not mastered a meter reading
25 concept, a refresher training session will be administered. Depending on the need

1 for and intensity of the additional training, the refresher training may be done
2 either back at the Deer Valley training shop or at the new home shop of the trainee
3 meter reader. The trainee will not be released back into the field until all concepts
4 have been mastered.

5 Trained meter reader standards are maintained by the expectations and
6 performance minimums standards. The expectations and performance minimums
7 were developed by a joint committee of meter readers, first level management
8 (usually departmental or section leaders), Human Resources personnel, and IBEW
9 representatives. The goal of the committee was to provide the best possible meter
10 reader for APS customers by setting consistent, fair and reasonable standards.
11 These standards are posted, updated, and reviewed at least every six months. They
12 are also part of the meter reading training curriculum.

13 **Q. DO APS METER READERS HAVE INCENTIVES TO MINIMIZE**
14 **UNREAD OR MISREAD METERS?**

15 A. Yes. Meter readers have incentives to obtain actual meter reads and to not have
16 meter reads estimated. These include both positive financial incentives, such as
17 additional pay for obtaining at least 99.9% accurate reads and for timely
18 completion of all reads on the meter reader's assigned route, as well as the
19 potential for disciplinary action if an employee's performance remains
20 substandard.

21 The contractual agreement between APS and the IBEW escalates the pay on the
22 following time/ performance schedule: (1) Meter Reader-first six months; (2)
23 Meter Reader-second six months; (3) Meter Reader-third six months; (4) Meter
24 Reader-thereafter; and (5) Meter Reader-special. This last category is for regular,
25 "grandfathered" employees. We also have a set of employees who are regular but

1 not "grandfathered" and, thus the highest scale they can reach is "Meter Reader-
2 thereafter." In addition, APS has IBEW employees (supplemental) on a second tier
3 pay scale. Their special pay is called "senior." In the case of supplemental
4 workers, if they do not perform up to expectations, they are coached and
5 eventually returned to the IBEW's candidate list. In order for a meter reader to
6 attain/maintain "special/senior" status, he or she must habitually complete all
7 routes and maintain an error factor of no more than one error per 1,000 dial read
8 meter reads.

9 **Q. DOES APS ROUTINELY EVALUATE ON-GOING METER READER
10 PERFORMANCE?**

11 Yes, APS conducts a statistical analysis of time stamp data (productive route
12 time), and systematically reviews error reports, door hanger reports and "lock-out"
13 reports. Field checks and customer contacts also provide other methods to evaluate
14 meter reader performance. In addition, the rotation of routes amongst meter
15 readers (in conformance with a commitment made by APS to the Commission
16 after *Ciconne*) provides a second set of eyes and will highlight any areas of needed
17 improvement or reflect improvements achieved with a given meter reader.

18 **Q. WHAT IS THE SIGNIFICANCE OF THE "TIME STAMP DATA" YOU
19 REFERENCED IN YOUR LAST ANSWER?**

20 A. Every meter read is time stamped by the Itron. Thus, APS knows precisely how
21 long a meter reader takes between reads and precisely how long it takes to
22 complete the entire route. We also know whether the read was typed in or was
23 down-loaded through the meter probe. This assures us that the meter reader is
24 actually reading the meters as scheduled.
25

1 **Q. WHY IS IT NECESSARY FOR APS TO ESTIMATE METER READS?**

2 A. APS estimates usage or consumption (kWh) and/or demand (kW) when APS is
3 unable to obtain a meter read for any one of a number of reasons. For instance,
4 APS may be unable to obtain a meter read because APS is unable to obtain access
5 to the customer's premises to read the meter (e.g., road closures due to weather or
6 other factors) or the customer has made it impossible to gain safe access to the
7 meter (e.g., locked gates, blocked meters, or dangerous animals). This also
8 includes extremely rare instances when the meter reader is prevented from getting
9 to a meter due to unsafe conditions not caused by the customer, such as bees,
10 rattlesnakes, etc. In addition, there are instances when meter malfunctions or other
11 meter issues prevent APS from obtaining a read (i.e., display is blank, dead meter).
12 Occasional personnel issues may cause a meter to go unread on its designated
13 cycle. For example, per APS' agreement with the Commission, APS rotates its
14 routes among meter readers every quarter. Also, new and previously non-existent
15 meters may be added to the routes due to customer growth. Either of these may
16 make a specific meter difficult to find. Finally, APS will not be able to obtain a
complete and valid meter read if the meter has been tampered with.

17 **Q. WHAT STEPS DOES APS TAKE TO MINIMIZE THE NECESSITY FOR**
18 **ESTIMATED READS?**

19 A. APS' policy, procedure and training instructions require that the meter reader will
20 always attempt to read the meter unless an unsafe condition presents itself. There
21 have been times where a meter reader determined that a meter was inaccessible
22 and then on a subsequent visit to the site, the meter was accessible. This can occur
23 for numerous reasons. For example, the subsequent meter reader may simply be
24 taller, thus enabling such reader to reach the gate latch or see over a fence that the
25 previous meter reader was unable to access. One meter reader may have a greater

1 tolerance for aggressive dogs than another and as a meter reader's experience
2 grows, his or her tolerance may increase. In addition, there may be some isolated
3 occasions where the individual meter reader did not make an adequate effort to
4 read the meter. This can occur when a gate has been locked for several months and
5 the meter reader will assume it is still locked and enter "locked out."

6 Various steps are taken in an effort to minimize each of these types of
7 occurrences. Those steps include:

- 8 • rotating routes among meter readers every quarter;
- 9 • monthly reports that identify those meter readers having higher than
10 expected "lockouts";
- 11 • review and research of all "no read" accounts; and
- 12 • identification of those accounts where door hangers were left.³

13 In addition, as described below, the various steps and activities associated with
14 APS' "no access procedures" are measures that minimize the occurrence of
15 estimates in field access conditions.

16 Expectations for meter reading route completion are outlined in the Meter Reader
17 Expectations and Performance Minimums document (a copy of which is attached
18 hereto as **Schedule TM-2**).

19
20
21
22
23
24 ³ Any accounts that are not read require the meter reader to prepare and leave a door
25 hanger. Meter readers that are not indicating that they are leaving door hangers will be
identified on this "lock out" report, referenced above.

1 Q. **WHAT STEPS DOES APS TAKE TO MINIMIZE AND RESOLVE, WITH**
2 **THE HELP OF ITS CUSTOMERS, “NO ACCESS” PROBLEMS?**

3 A. In September of 1995, APS adopted a “no access” procedure for residential
4 customers with an access problem in the Metro area. Under that policy, if the
5 customer service representative determined there was an access problem when
6 speaking with the customer, the representative could do one of the following: (1)
7 offer the Info Line number for the customer’s meter read office so that the
8 customer could assure that APS would have unassisted access to the meter; (2)
9 offer to send the customer a read schedule so that the customer will know when to
10 call the Info Line to find out the specific days of the month the meter reader will
11 be in their area; or (3) offer an APS company lock for use by the customer. (See
12 **Schedule TM-3** attached hereto.)

13 Under the 1995 policy, if the customer was unable to provide unassisted access to
14 the meter, the representative referred the customer to the Meter Read Section
15 Leader for the customer’s read office. The Meter Read Section Leader would offer
16 that customer one of two options: (1) switch to a non-demand time-of-use
17 (“TOU”) rate if the digital TOU meter can be read over the fence; or (2) offer to
18 switch the customer to a non-demand TOU rate and an Access Card (sometimes
19 referred to as a “Pink Card”), which would be mailed monthly to the customer so
20 that the customer could obtain a read and mail the card back to APS. (See
21 **Schedule TM-4** attached hereto.) And although there were iterations of the above
22 policy during subsequent years, the next major changes did not occur until 2003.

23 In June 2003, APS updated its no access policy to add further steps for each
24 estimated read. Under the current no-access policy, each month that a meter reader
25 is unable to access the meter for a monthly read, the meter reader leaves a door
hanger, indicating the reason he or she could not access the meter, such as “the

1 gate was locked or inaccessible,” “your pet is protecting your home from strangers
2 and would not allow me to enter your yard,” “plants and trees are covering or
3 blocking the view of the meter,” “the path to your meter is blocked or
4 inaccessible,” etc. The door hanger provides the phone number for the call center
5 and asks that the customer call APS. (See **Schedule TM-5** attached hereto.)

6 Each month APS is unable to access a meter, APS Meter Reading Administration
7 confirms that the meter reader left a no-access door hanger; if no door hanger was
8 left, Meter Reading Administration creates a Meter Access Request letter to be
9 sent to the customer.

10 In addition, (within metro Phoenix for residential customers since early 2001, and
11 later modified to include the rest of APS’ customers), in the third consecutive
12 month of no access, the customer’s account has been downloaded into an
13 automated dialer, which leaves an automated voice message at the customer’s
14 phone number of record that informs the customer of the “no access” problem.
15 The recorded message is as follows: “This is an important message from APS
16 regarding your electric bill. We have been unable to read your electric meter for at
17 least three consecutive months; therefore, your billings have been estimated.
18 Please call us at [relevant number] to resolve this issue and insure that your future
19 bills are accurate. The number again is [relevant number]. We thank you in
20 advance for your cooperation on this matter.” Second, the third consecutive “no
21 read” creates a billing exception, which I will describe in more detail later in my
22 testimony, that may prompt an APS billing representative to send a so called “blue
23 card” to the customer asking the customer to contact APS about any access
24 problem. Also, the meter reader would have left yet another “no-access” door
25 hanger that indicates the no access reason (e.g., dog) and asks the customer to
contact APS. If the customer contacts APS, an effort will be made to resolve the

1 access issue, and the customer can provide a read that will be used to determine
2 the accuracy of the estimated read utilized in the billing.

3 On the fourth consecutive month of no access, Meter Reading Administration
4 creates and mails the customer another postcard. The postcard instructs the
5 customer to contact the call center for access solutions.

6 By the fifth consecutive month of no access, the customer has received four door
7 hangers or meter access letters, a dialer call, and two post cards. In the fifth month,
8 Meter Reading Administration sends a second Active Accounts No Access letter
9 that instructs the customer to contact the Call Center to obtain access solutions to
10 avoid any potential interruption of service. The letter informs the customer that
11 APS will disconnect the customer's service, following the next month's read, if
12 the meter is still inaccessible. (See **Schedule TM-6** attached hereto.)

13 In the sixth consecutive month of no access, Meter Reading Administration
14 reviews an account for any indication that the customer has called to resolve
15 access. If none is found, Meter Reading Administration will attempt to call any
16 listed daytime phone numbers. If the customer is unreachable by phone, a
17 disconnect order is generated and sent to APS Field Services personnel. The
18 serviceman makes one more attempt to access the meter before service is
19 disconnected. If there is still no access to the meter, the disconnect order is
20 reassigned to Overhead or Underground (Metro) or Field Service Supervisor
21 (State) for actual disconnection of service in conformance with Commission
22 regulations.

23 Although APS employs all of these special attempts to contact our customers
24 about access problems, the bill itself is yet another communication tool. Under
25 most circumstances, each estimated bill for demand meters includes a side bill

1 message in the margin that reads as follows: “*ALERT/ALERT* A meter reading
2 issue exists at your location. Please call us at 602-371-7171 (Metro Phoenix area)
3 or 1-800-253-9405 (other areas).” (See **Schedule TM-7** attached hereto.)

4 **Q. HOW DOES APS MONITOR CUSTOMER SATISFACTION**
5 **CONCERNING METER READING AND BILLING?**

6 A. APS continuously monitors customer satisfaction concerning meter reading and
7 billing. In order to do so, we engage third party research firms to perform surveys
8 of our customers on an annual basis. This provides information on Customer
9 Satisfaction in general and includes testing customer perception on the accuracy of
10 our bills and the separate elements of our bill and bill format.

11 Within the Billing & Payment component of the customer research, the attribute
12 that best reflects a customer’s perception of meter reading/billing is “Accuracy of
13 the bill.” On one national survey, APS has a mean score of 8.30 on a scale of 1 to
14 10 where 1 is Unacceptable, 10 is Outstanding and 5 is Average. This reflects a
15 very substantial improvement since the billing problems that accompanied the
16 conversion to the new CIS in 1998-1999, when APS scored 7.43. It is also proof
17 that our heightened emphasis on customer service is paying off where it counts --
18 with our customers.

19 In addition, we track informal complaints to the Commission for meter reading
20 and billing as well as informal customer complaints that were resolved by the APS
21 Consumers Advocate’s Office that did not go to the Commission. Through the end
22 of October, 2004 there have been 95 informal billing complaints and 20 informal
23 meter reading complaints. There were 24 billing and 5 informal meter reading
24 complaints resolved by APS that did not escalate to the Commission. Both types
25 of complaints have been significantly reduced in the past five years. For example,

1 the figures that correspond with the 95 and 20 informal complaints referenced
2 above for 1999 were 164 and 31, while the figures for 1999 corresponding to the
3 24 and 5 informal complaints would be 144 and 26.

4 Of the informal billing complaints, the majority are not about inaccurate bills but
5 rather relate to customers' concerns about high bills. The resolution is normally to
6 educate our customers about energy use and offer to make payment arrangements.
7 There were only nine bills that needed to be adjusted this year based on these
8 informal complaints to the Consumer Advocate's Office.

9 Two thirds of the informal meter reading complaints are related to access issues
10 and the other third are more general in nature such as a customer concerned about
11 the ability of our meter reader to accurately read their meter with a magnifying
12 device or needing to explain how kW demand works. Of the access related
13 complaints, the majority involve the advocates explaining our need to have safe,
14 unassisted access to read demand meters and are usually resolved by the customer
15 agreeing to provide access.

16 IV. APS' ESTIMATING METHODS

17 **Q. WHAT IS MEANT BY THE TERMS "CONSUMPTION" AND**
18 **"DEMAND"?**

19 **A.** APS is required by A.A.C. R14-2-210A to bill its electric customers on a monthly
20 basis. APS offers its customers a number of billing rates from which to choose. An
21 important distinction between those rate are the bases on which they are
22 calculated—consumption and demand. "Demand rate" accounts use both
23 components. Consumption, or "kWh" (kilowatt hours) is the total amount of
24 electricity that a customer has used during that billing cycle. KWh is the initial
25 factor in the amount of the bill received by APS' customers. Demand, or "kW"

1 (kilowatt), on the other hand, is the peak electric capacity consumed during a one-
2 hour period in that billing cycle for residential accounts and a fifteen-minute
3 period for commercial accounts. Kilowatt hours (kWh) and kilowatts (kW) are
4 both billed at specific rates mandated by the Commission, and those line items are
5 then totaled, resulting in a sum owed to APS for electrical use during that billing
6 period.

7 **Q. HOW DO ESTIMATED READS AFFECT NON-DEMAND ACCOUNTS?**

8 A. The billing on non-demand accounts is based on accumulated usage, much like the
9 mileage on a car's odometer. Therefore, when a bill is estimated, the next bill that
10 is based on an actual read (when added to the estimated bills), will be a "true up"
11 and reflect the actual consumption since the last actual meter read. For example, if
12 the estimate of usage in the first month was lower than actual usage, the following
13 "true up" bill for month two will be correspondingly higher than actual usage for
14 month two and the combination of month one and month two bills will be the
15 actual usage for both months. Therefore, the customer has only been billed for
16 actual usage. Although there can be minor bill impacts due to rate blocking, as
17 well as TOU and seasonal rates, the study presented by APS witness Rumolo
18 indicates these impacts are largely off-setting in the aggregate, although still
19 resulting in a net underbilling. In certain situations, the actual read falls outside the
20 computer's (i.e., the "CIS's") high/low criteria because the actual read is either
21 much too low or much too high compared to the previous estimated read. The CIS
22 then generates a billing exception that is routed to a billing representative who
23 prepares a corrected bill which redistributes actual energy across the month, or
24 months, of missing reads in proportion to the number of days in each billing
25 period. The bill (or bills) for the missing read period(s) is/are adjusted to reflect
the prorated energy, and the customer's current bill is either credited or debited the

1 difference between the estimated bill(s) and the prorated bill(s). Accordingly, there
2 is no evidence of any over-estimating of energy usage with respect to non-demand
3 accounts (such as Complainant Read's account at 6826 E. Solcito Lane).

4 **Q. DID THE OLD CIS AUTOMATICALLY SEND BILLS REQUIRING**
5 **ESTIMATED DEMANDS TO DEMAND RATE CUSTOMERS?**

6 A. No. Bills with a demand component requiring estimation under the old CIS
7 triggered what was and is referred to as a "billing exception." Under the old CIS, a
8 billing representative reviewed every account for which a billing exception had
9 been created for that particular month. At that point, the billing representative
10 could either: (1) use the estimated demand read provided (but not billed) by the
11 old CIS to the billing representative (sometimes referred to as a "courtesy"
12 estimate); or (2) if the CIS data appeared to be insufficient, manually calculate the
13 consumption and/or demand estimates after reviewing that customer's account
14 history and, if believed necessary, demands of other similar customers; and/or (3)
15 request that a meter reader make another attempt to obtain an actual meter read. It
16 is impossible for APS, or any other utility, however, to conclusively determine,
17 after the fact, the demand component of a customer's monthly usage. Thus, absent
18 an actual read of the demand meter, an estimate of demand is the only available
19 option.

20 **Q. WHAT OCCURRED, IN TERMS OF BILLING, IN SEPTEMBER 1998?**

21 A. In September of 1998, APS began using a new computer system acquired from
22 IBM and previously installed at Northern Indiana Public Service Company. APS
23 commonly referred to this new computer system as "new CIS." This new system
24 was necessary for APS to accommodate retail access, then scheduled to begin
25 January 1, 1999. Although the new CIS system has always been able to estimate

1 consumption (kWh), at its inception and for approximately the next eight months,
2 the new CIS was unable to estimate demand (kW). Thus, from September 1998
3 through early March 1999, if the new CIS did not have an actual read for the
4 demand number, the system would create a billing exception for that account. As
5 with the old CIS system, the billing exceptions caused a billing representative to
6 review the account and calculate the required demand estimate. The billing
7 representative could do so by manually calculating the estimates after reviewing
8 that customer's account history and, if believed necessary, demands of similar
9 customers, or could request that a meter reader make another additional attempt to
10 obtain an actual read of the meter if possible.

11 **Q. AFTER MARCH 1999, DID NEW CIS GENERATE ALL BILLS THAT
12 CONTAINED ESTIMATED READS?**

13 **A.** No, in a number of instances the new CIS still generated a billing exception for
14 bills that required estimates (thus requiring the billing representative to review the
15 calculation or prepare the estimated bills). For example, if the customer did not
16 have a sufficient history from which to calculate consumption (kWh), the new CIS
17 would generate a billing exception. In addition, as of April 1999, if a customer had
18 received a bill that contained estimates for more than three consecutive months,
19 the APS computer billing system created a billing exception. (As noted earlier, this
20 was later changed to create the same billing exception a month earlier.) In both
21 instances, the billing exception requires that account to be reviewed by a billing
22 representative who manually calculates the bill based on that customer's account
23 history and similar customers' load factors, and/or requests that a meter reader
again attempt to obtain an actual read of the meter.

24 **Q. WHAT OCCURS IF THE DEMAND COMPONENT OF AN ESTIMATED
25 READ IS DETERMINED TO BE TOO HIGH BASED ON A SUBSEQUENT
ACTUAL READ?**

1 A. As of September 2003, when APS obtains an actual read after sending out an
2 estimated read, the computer billing system creates a billing exception if the
3 system determines that the demand component of the previous estimated read was
4 too high. For instance, if APS estimated the demand portion as 10 kW, but the
5 actual demand read following that estimated bill was 9 kW, CIS would create a
6 billing exception when the bill that included the demand read of 9 kW was
7 generated. The billing exception requires that account to be reviewed by a billing
8 representative. If the billing representative determines that the estimated demand
9 was too high based on the read, the billing representative would make a refund to
10 the customer by adjusting the current month's bill to reflect the credit to be
11 provided for the previous month.

12 **Q. DID APS ADJUST ANY BILLS PRIOR TO SEPTEMBER 2003 BECAUSE
13 OF A SUBSEQUENT LOWER DEMAND READ?**

14 A. Yes, but that was not the routine practice. If a bill was kicked out for an exception
15 for reasons other than a subsequent lower demand read (e.g., the kWh read failed a
16 high/low test), the APS billing representative would have noticed the
17 inconsistency between the earlier estimate of demand and the subsequent meter
18 read and would have credited the customer's account.

19 When the change was made in 2003 to make such crediting a routine practice, it
20 was not without some concerns. Making an adjustment when the estimate is high -
21 but not when it was too low - creates an inherent bias in favor of underestimation.
22 APS believes, and the study presented by Mr. Rumolo confirms, that APS has
23 consistently underestimated customer usage over the years, to the detriment of the
24 Company and its other customers. Adopting the policy we did in 2003 exacerbates
25 that underestimation, which is not reflected in Mr. Rumolo's study. Even on the
individual customer level, if that customer has had an overestimated demand one

1 month, for which he or she now receives an automatic credit, but underestimated
2 demand in other months, for which he or she is never billed, that customer has
3 been unjustly enriched. Thus, the decision was made not to apply the change in
4 Company policy retroactively.

5 **Q. WHAT DETERMINES WHETHER A BILL BASED ON AN ESTIMATED**
6 **METER READ WILL BE GENERATED AND ISSUED BY THE**
7 **COMPANY'S COMPUTERIZED BILLING SYSTEM RATHER THAN**
8 **BEING GENERATED MANUALLY BY AN APS EMPLOYEE?**

9 A. When the meter read comes in from the CIS Meter Reading sub-system with
10 "meter-not-read" status, the CIS Billing sub-system will attempt to generate an
11 estimate. There are several business rules coded within the CIS Billing System that
12 determines if an account can be properly estimated by the billing system. If the
13 system successfully estimates the usage, a billing statement gets sent out the same
14 night to the customer. Such statement will indicate that it was estimated.

15 If the CIS Billing system is unable to estimate, based on the coded business rules
16 in the system, a "billing exception" is generated. Resolution of the billing
17 exception will be manually completed by an APS billing representatives and a
18 billing statement will be produced for the customer. The resolution of the billing
19 exception involves estimation of meter reads, if necessary. If the reads are
20 estimated, it will be represented as such on the statement. As is the case with
21 automated bill estimations, customers are given a phone number to call if they
22 have questions about or wish to dispute the estimated usage.
23
24
25

1 **Q. HOW DOES APS ADJUST ESTIMATED KWH USAGE BASED ON**
2 **SUBSEQUENT ACTUAL READ?**

3 A. When APS obtains an actual read following a previously estimated meter read that
4 does not fall within the bounds of APS' normal "high-low" energy usage criteria
5 for the previous month, CIS creates an exception. A billing representative
6 evaluates the exception to determine if the new read indicates that the prior
7 estimated read now appears to be significantly high or low. If the billing
8 representative determines that the estimated read is either high or low, taking into
9 account normal seasonal usage changes, then the billing representative will adjust
10 the previous month's estimated read taking into account the subsequent actual
11 read.

12 The amount of energy usage (kWh) can be estimated for Final and Active Monthly
13 Bills by comparing a subsequent actual read with the last prior actual read and
14 determining the difference to get the adjusted missing read. The difference
15 between the last actual read prior to the estimated read, and the new actual read
16 subsequent to the estimated read are used to calculate the per day usage. The per
17 day usage is multiplied by the number of days for the bill to yield the total energy
18 used in the billing periods.

19 Example of Reallocation of Energy Usage Based On Subsequent Actual Read

20 Assume on May 15 APS had an actual read of 19886.

21 On June 16, APS estimated energy usage for 32 days (May 15 to June 16).

22 On July 14 APS obtained an actual read of 23210 for 28 days (June 16 to July 14).

23 Total number of days: $28 + 32 = 60$

24 Total Usage: $23210 - 19886 = 3,324$ kWh for 60 days

25 Per day usage: $3,324 / 60 = 55.4$ kWh

Estimated June usage: $32 \times 55.4 = 1,773$ kWh

1 Estimated June read: $19886 + 1773 = 21659$

2 As noted and discussed earlier, an estimated demand (kW) will be reduced later
3 when a subsequent actual demand read is lower than the estimated demand read
4 for the previous missing-read billing period. When CIS finds this circumstance, it
5 produces a billing exception. The billing representative who receives the exception
6 notice reduces the previously estimated demand to the actual read, and credits the
7 customer's account balance for the difference in the demand charge.

8 Exception 193, which is attached hereto as **Schedule TM-8**, is a print-out of an
9 on-line billing guideline used by APS billing representatives.

10
11 **Q. PLEASE DESCRIBE APS' PROCEDURES FOR ENSURING THAT EVERY BILL RESULTING FROM AN ESTIMATED METER READ IS APPROPRIATELY DESIGNATED AS SUCH.**

12
13 **Q. YES. EVERY SUCH BILL BY THE CIS BILLING SYSTEM OR THE APS BILLING REPRESENTATIVES IS APPROPRIATELY DESIGNATED AS SUCH ON THE PRINTED STATEMENT. HAS APS INDICATED THE REASON FOR THE ESTIMATION ON EVERY APS BILL BASED ON AN ESTIMATED READ?**

14
15
16 **A.** No. APS sometimes did not provide a reason for the estimation on the customer's
17 bill when the reason did not involve any act or omission by the customer, and thus
18 there was nothing the customer could have done or could do in the future to
19 address the cause for the estimation. Although I understand the basis for this
20 omission, I also recognize that the Commission's rule requires that we provide a
21 reason for our estimation on the customer's bill, and thus APS is presently
22 implementing the appropriate changes to its billing software.

23 **V. WHAT IS THE IMPACT ON CONSUMERS OF**
24 **APS' BILL ESTIMATION METHODS**

25 **Q. CAN ESTIMATED DEMAND READS WORK TO THE CUSTOMER'S FAVOR?**

1 A. Bills that contain estimated demand reads often work to the customer's favor. For
2 example, attached as **Schedules TM-9 and 10** are copies of the billing histories of
3 two random demand account customers who received bills that contained
4 estimates. In each instance, the estimated demand is clearly lower than the demand
5 actually used in the months both before and after the estimated reads.

6 **Schedule TM-9** is the account history for Meter Number E26017. This customer
7 had an actual demand meter read in February 1999 of 9.1 kW. The customer then
8 received bills that estimated demand in March, April and May 1999. The
9 estimated demands were 5, 4.7, and 4.3 kW, respectively. Beginning in June 1999,
10 the customer then received bills that contained actual reads, and the actual demand
11 reads were significantly higher than the estimated demand reads. For instance, the
12 demand read in June was 9.5 kW; July was 8.7; August was 8.4; and September
13 was 9.8.

14 A customer is charged per unit of demand (kW). In March 1999, for rate EC-1,
15 APS billed \$7.68 for each kW used. Thus, in March 1999, the charge for the
16 account referenced above for the estimated demand was \$38.40. If the demand had
17 been estimated at 8.5, for instance, which is a figure much more in line with this
18 customer's historical demand use, the charge for the demand would have been
19 \$65.28. *Id.*

20 **Schedule TM-10** is the account history for Meter Number C871111. On October
21 25, 2000, the actual demand read was 8. From November 2000 through March
22 2001, APS estimated the demand at numbers that ranged from 1.6 to 3.9.
23 Beginning in April 2001, however, APS was able to obtain actual reads of the
24 meter, and for the next seven months, the actual demand was 5.8; 6.8; 6.3; 6.2;
25 6.3; 6.6; and 5.9 kW.

1 Even if it appears that estimated demands were too low based on historical usage,
2 APS does not go back to the customer for additional payment. Thus, in instances
3 where estimated demands were lower than what was probably actually used, the
4 estimated demand figures inure to the benefit of the customer. In contrast, if APS
5 discovers that an estimate of a demand account was too high, APS gives the
6 customer a rebate on the customer's next bill.

7 I realize that these are just anecdotal examples. However, Mr. Rumolo presents a
8 comprehensive analysis of the issue of underestimation as part of his testimony.
9 Such analysis confirms what our billing representatives have long maintained,
10 which is that APS bends over backwards to be fair to those customers who receive
11 bills based on estimated meter reads.

12 VI. CONCLUSION

13 **Q. DO YOU HAVE ANY CONCLUDING REMARKS?**

14 A. APS takes its responsibility to provide accurate and timely bills to its customers
15 seriously. It has devoted significant human and mechanical resources to doing just
16 that. Even when it is forced to bill its customers based on an estimate of their
17 usage, it does so in a reasonable, fair and timely manner. APS is proud of the
18 strides it has made in recent years to elevate all aspects of its service, including
19 meter reading and billing. We look forward to continuing and, if possible, building
20 upon this effort in the future.

21 **Q. DOES THIS CONCLUDE YOUR PREFILED TESTIMONY IN THIS**
22 **PROCEEDING?**

23 A. Yes.
24
25

APPENDIX A

STATEMENT OF QUALIFICATIONS

Tammy McLeod has worked for Arizona Public Service Company since January of 1995. She began as a Segment Manager in Marketing. In 1997, Ms. McLeod accepted a developmental rotation as the Manager of Customer Offices within Customer Service. She was promoted to Director of Customer Operations later that year. Currently, her position is the General Manager of Customer Service and Southern Arizona Operations. Ms. McLeod received her Bachelor of Science from the University of Colorado and her Masters of Business Administration from the Wharton School at the University of Pennsylvania.

TOTAL NUMBER OF METERS IN THE FIELD

RC_CD	RC_DESC	Count
1	RESIDENTIAL	915,992
2	COMMERCIAL	103,511
3	INDUSTRIAL	3,536
4	IRRIGATION	358
5	STREET LIGHTING PUBLIC	25
6	OTH. SALES TO PUBLIC AUTHORITY	196
	TOTAL	1,023,618 Meters installed in the Field

TOTAL NUMBER OF METERS IN THE FIELD

RC_CD	RC_DESC	Count
1	RESIDENTIAL	522,816
2	COMMERCIAL	83,928
3	INDUSTRIAL	3,222
4	IRRIGATION	322
5	STREET LIGHTING PUBLIC	17
6	OTH. SALES TO PUBLIC AUTHORITY	41
	TOTAL	610,346 Demand meters in the Field

TOTAL NUMBER OF METERS IN THE FIELD

RC_CD	RC_DESC	Probed	Non Probed	Total
1	RESIDENTIAL	51,181	16,806	67,987
2	COMMERCIAL	58,988	24,934	83,922
3	INDUSTRIAL	2,239	976	3,215
4	IRRIGATION	237	85	322
5	STREET LIGHTING PUBLIC	4	-	4
	TOTAL	112,649	42,801	155,450

**Meter Reader Expectations
and
Performance Minimums
August 2004**

Meter Readers shall wear appropriate uniforms; footwear, eye protection and display Company badge so that it is readily visible to customers.

Meter locations

- Slot 1 – Will have the direction physical location. (Except for rural reading. If a meter is not on a house use the house as reference.)
- Slot 2 – Prevail location (ZN, ZS, ZW, ZE...) which side to enter on
- Slot 3 – Access (dog, company lock...)

Meter message

- Clear and identifiable messages only
 - No cryptic messages such as abbreviated letters crammed in together.
Example of non-acceptable notes: FLW SS (Frank Lloyd Wright south side)
Acceptable: Go N. Mtr faces S.
 - Add directions to get to meter
- Any notes not updated in the meter instructions/forced message slot and directions, is a safety issue.

T.O.U. reading

- All T.O.U. meters should be probed whenever there is access.
- Non-accessible T.O.U. meters should be read manually, whenever possible, for each dial and a "G" entered for kW not reset. Lockout reason should be provided.

Lockouts/Freeform messages

- Consistency using lockout codes.
- Lockout codes must be supported by freeform messages for all accounts. Such as:

Lockout Code	Freeform message
Blocked Meter	Need information if meter or pathway to meter is blocked, and with what.
No Answer at Door	Reason why we needed to knock on door, due to dog, locked gate, locked laundry room door, etc.
Locked Gate	Need key or combination, identify where (need key for east gate)

- Whenever possible, attempt to get lockouts at end of day after route is completed.
- Customer has multiple access problems:
 - If any safety issues (such as dog) use first to lockout then add the other access notes in freeform. For example: If customer has dog in yard and locked gate.... Lockout for dog then in freeform enter locked gate. This will alert office personnel that there are more than one access problems when communicating with the customer to resolve the access issue(s).

Door Hangers

- All inaccessible meters, (meters with foliage or safety concerns etc) should be left a door hanger, monthly, until meter is accessible to read. A code "40" (left door-hanger) should be entered on the handheld.

Vehicles

- Daily and weekly inspections shall be performed on Company vehicles. The vehicle shall be maintained in a manner to promote good Company image, and maintained to meet all safety requirements. Safe and courteous driving is required. Vehicles shall not be left running if unattended. Vehicles will be driven on the correct side of the street. Vehicles will not be parked to block entry to driveways or parked in reserved spaces. Radios should not be loud enough to be heard outside of the vehicle. Vehicles should not be used to read routes that are more efficiently read as walking routes.

Rural Reading

- When meter is not on house use the house as reference.
- If there is no house, use the entrance (the way you gained access into yard) as reference.
- Use mileage
- Use left and right directions when necessary.
-

Route Maintenance

A properly sequenced route will consist of:

- 1st account on route will have "Start Here". This will let anyone who reads the route know, which account to start on. Plus, provide directions to get to route from the shop location.
- Truck, park here, walk, and pick up vehicle – this should be included in notes and note time away from truck, i.e.; walk one hour.
- Update notes even if it's a stranger route. (safety and route maintenance)
- On a stranger route - it is ok to sequence in meters (i.e. pedestals) but not to re-sequence route.
- Provide date on notes regarding access such as dogs, doggy door and gates.
- Must have continuous flow, especially with the flow of traffic, it is recommended to read alley's first.
- When re-sequencing route update notes.

Important actions while reading

- Be safe - Watch where you are walking, wear PPE, operate vehicles safely
- Be productive - Maintain routes with notes, sequence for efficiency and catch lock-outs at end of route
- Be positive - Present a positive image; be courteous in your driving and parking, be friendly to the customers and display a professional appearance.

Route maintenance complaints

If a meter reader has a complaint about maintenance on a route that is not their normal assigned route:

- 1st time - Meter reader will demonstrate professionalism and courtesy and address the issue to the meter reader responsible for maintaining the route.
- 2nd time – If no changes have been made Meter Reader to approach the Production Coordinator.
- Pull meter trail the day in question. Production Coordinator will then need to check if notes have been updated. If not, Production Coordinator will discuss route maintenance with Meter Reader normally assigned the route.
- 3rd time – Production Coordinator will monitor route the next month and if the route still remains to be un-maintained, the Supervisor will be notified.

It is okay for the meter reader to sequence his or her own route as long as it flows. This will make it easy for others who read behind to follow.

Expectations for meter reader levels:

1st - 6 (measured at 9 months)

1. Low reading error factor. (expectation measurement 2.0 by 6th month) (performance minimum 3.0)
2. Ability to show up to work on time. (measurement 3 or more in 6 months)
3. Know directions. (i.e. north, south, east, west, right and left)
4. Demonstrates commitment to safety. Includes keeping company vehicles clean and inspected. (measurement - zero accidents and property damage)
5. Satisfactory completes two (2) weeks training in Deer Valley or 501 meter reading shops, (501 encouraged) with various meter readers.
6. Must successfully complete 30/60/90 day on Meterpro at level 3 in 15 minutes with a passing grade of 80%.
7. Maintain physical ability to complete job assignments.
8. By 6 months - completing routes to the satisfaction of the measurement of this step. (Measurement-90%of assignment)
9. Uses understandable lockout codes and messages. (measurement customer complaints - 4 or more)
10. Distributes door-hangers for problem accounts with access. (measurement -periodic field spot checks for proper use)
11. Demonstrates a thorough understanding of procedures to follow for accidents, time off, etc.
12. Promotes harmony and positive attitude to work and others.

2nd-6

1. Ability to re-sequence route. read order vs. meter trail sequence
2. Ability to show up to work on time. (measurement 3 or more tardy's annually)
3. Low reading error factor. (Expectation Measurement - 1.5 or less) (Performance minimum 2.5)
4. Low lockouts. (measurement equal to or less than shop average)
5. Uses understandable lockout codes and messages. (measurement 3 or more customer complaints)
6. Distributes door-hangers for problem accounts with access. (measurement _periodic spot field checks)
7. Completion of route by the end of 12 months. (Measurement 100% of the assignment)
8. Demonstrates commitment to safety. Includes keeping company vehicles clean and inspected. (measurement zero accidents and property damage)
9. Maintains route maintenance/information on a monthly basis (measurement (new sets, meter changes, wrong routes, etc. are updated)
10. Promotes harmony and positive attitude to work and others.

3rd-6 and Thereafter

Error Factor (Expectation Measurement 1.5 or less) (Performance minimum 2.0)

Meets all of the criteria listed through 2nd-6, plus:

Completes assigned work. (measurement 100%)

1. Provides training to other meter readers, as assigned.
2. Promotes harmony and positive attitude to work and others.
3. Maintains an error factor of 1.2 or less.

Meter Reader Special Tier/ Senior Tier/T/A Tier– Special / Senior /T/A Tier Pay is an incentive/bonus

Areas that are measured to evaluate for meter reader special are defined in the LOMA for Meter Reader Special classification.

Special classification Meter readers who do not meet the evaluation criteria will be returned to 3rd step progression.

Performance Minimums

Meter Readers who are not meeting performance minimums, as outlined, will be placed on a maximum 90 day performance track.

MEASUREMENTS - Senior/Special/Thereafter Tier	POINTS
No major accidents	1
100% Route completion	1
TOTAL POINTS	2
Required points	2
*immediate loss of classification for remainder of current month and next two months for preventable accidents and/or property damage/loss greater than \$500.00	

Date September 18, 1995

To Distribution

From Gayle Blake

Sta # 3851

Ext # 83-7696

SUBJECT New No Access Guidelines for Existing Customers

Effective immediately, there will be a new no access procedure for existing residential customers that currently have an access problem in the Metro area

The procedure for new customer connects or existing customers requesting a rate change to a TOU rate has not changed. These customers will need to provide unassisted access and are not eligible for the options listed below.

The new guidelines for existing no access problems have been established to

- Help reduce the number of venfies that are sent to the field by Billing Services
- Reduce the number of estimated bills
- To improve our safety goals by eliminating potential meter read hazards

If you determine there is an access problem when speaking with a customer, the following options are available:

- 1 Offer the Info Line phone number for your customer's meter read office. This will provide the customer with enough information so they can guarantee that we will have unassisted access to the meter (Rate Codes: 1800, 1200, 1600, 1300, 0800, 0100)

The Info Line phone numbers are as follows

<u>Read Office</u>	<u>Info Line Number</u>
191, 192, 193	250-2558
291, 391, 396	250-2552
293, 395	250-2556
392, 393	250-2560
394, 397	250-2562

AND

APS05703

- 2 Offer to send the customer a meter read schedule so they will know when to call the Info Line and find out the days of the month the meter reader will be in their area (Rate Codes: 1800, 1200, 1600, 1300, 0800, 0100)

Note It is important to generate a meter reading schedule through the IVR so the CSIF screen is automatically updated to generate a new meter reading schedule each year

OR

- 3 Offer an APS company lock (if applicable) (Rate Codes: 1800, 1200, 1600, 1300, 0800, 0100)

If you have a customer that absolutely cannot provide unassisted access to the meter, you will need to refer the customer to the Meter Read Section Leader for the customer's read office. You may transfer the call directly to the Meter Read Section Leader or send a VISTA note with the customer's account information and phone number.

The Meter Read Section Leader will follow up with the customer and field check the location if necessary. The Meter Read Section Leader may offer one of the following options:

- 1 If a TOU digital meter can be read over the fence, the Section Leader may offer the TOU rate to the customer. However, sunlight, meter location, etc. will affect the ability to obtain a read from a digital meter over the fence (Rate Codes: 1200, 0800, 0100)
- 2 The Meter Read Section Leader may offer an Access Card (Pink Card). This card will be offered ONLY when no other options are available to access the meter. The Access card will be mailed monthly to the customer so they can obtain a read. The customer will need to send the card back with a read the same day they receive the card in the mail (Rate Codes: 1200, 0800, 0100)

If the access card is returned to us on the scheduled read date - the meter reader will enter the reads that afternoon.

If the access card is returned after the scheduled read date - the information will be sent to Billing Services.

If the access card is not returned - the customer's bill will be estimated.

The Meter Read Section Leaders will be monitoring the no access reports on a daily basis. The CMSG screen will be updated to indicate what options or arrangements were made with the customer.

APS05704

As a reminder, please refer to the standard line of questioning listed below to determine accessibility to the meter

Q Where is the meter located?

Access the MTRR or MVTO screen to view the MTR RD MSG field for reason codes or meter read message codes that indicate any previous access problems Refer to Meter Read Message Codes in the Codes and Terms chapter or Rep Direct

Access the MRDC screen to check the meter location codes to determine if there may be an access problem Update the MRDC screen with any new information Refer to Meter Read Location and Instruction Code in Codes and Terms chapter or Rep Direct

Note If the meter is located inside (porch, garage, house, etc), a TOU rate is not an option Advise the customer they have the option of paying to have the meter and service entrance relocated You will need to refer the customer to a Service Coordinator (Metro) or the CSP (State) for the area

Q Do you have a dog?

Advise the customer that the dogs will need to be secured away from the meter by a dog run, fence, or inside the home on the date the meter will be read Update the MRDC with the type of dog (example dog/pit bull or dog/retriever)

Note Do not indicate whether the dog is bad or okay A dog's temperament may be different with different meter readers so each meter reader will determine their own comfort level with a dog

Q Do you have a swimming pool?

Advise customer that the locking part of the latch needs to be on the outside of the gate You may offer the customer an APS lock

If the customer is unable to provide you with enough information to determine that APS will have unassisted access Please refer the customer the appropriate Meter Read Section Leader

If you have any questions, please contact Donna Frazer at ext 81-1224 or pager 226-2233

This information will be updated in the next edition of Rep Direct.

Distribution

Metro Region Customer Office & Support
State Region Customer Office Section Leaders
Local Reps

cc

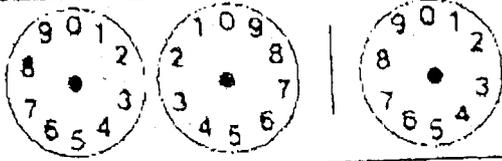
Jeanne Jones	3192	Karen Wolff	3858
Shereen Lovendge	3855	Denise Hutchinson	3851

APS05705

Donna Frazer	4621	Phil Cea	3378
Chuck Evans	4038	Brian Riffle	2618
Dan Kolmos	3378	Ruben Alcocer	4621
Ed Guthrie	4038	Ginger Pitts	4101

APS05706

Cycle 16

	
<p>If your meter shows fewer than 5 dials, cross off the left-hand dial above. Please mark the pointers exactly as they appear on your meter.</p>	
	<p>DATE that you read your meter.</p> <p style="font-size: 1.5em; font-family: cursive;">11-20-04</p>
<p>Your Service Address</p>	

**IF YOUR METER HAS A DIGITAL DISPLAY,
PLEASE FILL IN THE BOXES BELOW.**

The digital display, located on the bottom half of the meter, will flash four or five different readings. Each display will operate for approximately seven seconds. Some electronic meters will display 88888888 prior to the readings. Please enter the numbers in the appropriate boxes listed below.

01							
02							
03							
04							
05							

Reason for variation in electric usage.

- Premises vacant.
- Have added appliances.
- Have been away from home.
- Don't know reason for change.

YES, I would like to arrange for monthly access to remain on my present rate. Please call me at:

Daytime Phone: () _____

Evening Phone: () _____

Thank You!



THE POWER TO MAKE IT HAPPEN™



A message from your **APS** Meter Reader...

I was here today to read the APS meter, but could not get a read because:



Your gate was locked and/or you latch is out of reach.



Your pet is protecting your house from strangers and would not allow me to enter your yard.



Foliage is covering or blocking the view of the meter.

Path to meter is inaccessible.



We have solutions to offer you.

Please take a minute to call us:

English: (602) 371-7061

Spanish: (602) 371-7051

Toll-free: (877) 873-8798

Your assistance is appreciated!

APS

Active Account
No Access

September 9, 2003

«cust_name»
«addr1»
«addr2»

Dear «Cust_Name»

The electric service will be disconnected at «SADD» as we have been unable to safely access and read the electric meter for five or more consecutive months

We want to provide you uninterrupted service and accurate billings, so please take a moment to contact us

Your service will be disconnected following your next read if we are unable to safely access your meter. To re-establish service, safe access will be required and reconnect charges will apply.

Please call (602) 371-7061 or 1-877-873-8798 to provide us an opportunity to offer access solutions. We can also assist you in Spanish at (602) 371-7051 (en Español)

Sincerely,

APS Customer Service

APS05721

Your Account Number 824204282
Billing Date Apr 16, 2002

Questions? Visit our website at www.aps.com or
call 602-371-7171, 24 hours a day, 7 days a week.
Para servicio en español llame al 602-371-6861.

Previous Balance	Payments Received	Current Charges	Total Due by 04/29/2002
0.00	0.00	47.95	47.95

*** ALERT/ALERT ***

A meter reading issue exists at your location.

PLEASE CALL US at: 602-371-7171 (Metro Phoenix area) or 1-800-253-9405 (other areas).

SERVICE INFORMATION

Service number 300TS20286
Your service plan Time Advantage Rate
Service address 3638 W Caribbean Ln

Your meter number E38746
Your meter is read in cycle 07

On Apr 11 your total kWh read was 54186
On Mar 14 your total kWh read was 54118
Your total kWh usage is 68

This month's read was estimated - DOG
On Apr 11 your on-peak kWh read was 22764
On Mar 14 your on-peak kWh read was 22739
Your on-peak kWh usage is 25
Your off-peak kWh usage is 43

ENERGY USE COMPARISON			
	This Month	Last Month	Last Year
Days	28	N/A	N/A
Daily kWh	2	N/A	N/A
Daily Cost \$	0.75	N/A	N/A

CURRENT CHARGES

Basic service charge 15.00
Charge for on-peak kWh used 2.76
Charge for off-peak kWh used 1.84
ACC mandated environmental surcharge 0.06
Regulatory assessment 0.04
Sales tax 1.41
Current energy & delivery charges 21.11

Service establishment charge 03/14/2002 25.00
Regulatory Assessment 0.05
Sales Tax 1.79
Current miscellaneous charges & credits 26.84

Total current charges 47.95

When paying in person, please bring bottom portion of this bill.

Billing Date
Apr 16, 2002

Account Number
824204282

Account Number
824204282

Billing Date
Apr 16, 2002

ENTER AMOUNT ENCLOSED

MAKE CHECK
PAYABLE TO: APS

ENTER S.H.A.R.E. AMOUNT

Check No. _____

Date paid _____

Amount _____

LINDA SCHAEFFER
PAUL SCHAEFFER
3638 W CARIBBEAN LN
PHOENIX AZ 85053-4637

If contributing to S.H.A.R.E.
please enter amount in S.H.A.R.E.
box and add to your total

TOTAL AMOUNT OF
\$47.95
DUE BY 04/29/2002

KEEP THIS STUB
PORTION FOR
YOUR RECORDS

07 R 1 1

00000008242042828020020416000002684900000479564 000

APS05719

Exception 193 - Current Month KW Less Than Previous Estimated KW

Background

A demand meter registers both the kwh (energy) usage and KW (demand). The demand is measured for a specific timed interval determined by the service plan and meter type. Once the demand meter registers the highest KW (demand) during the month, it will retain that KW until the meter is reset. It does not go backwards (lower), and will only go forward (higher), if anytime before the meter is reset a higher demand registers.

Description

This exception is created when the current month's actual registered KW (demand) is lower than the estimated KW (demand) from the previous month. To resolve this exception you will need to cancel the previous month(s) bill (with the estimated demand), lower the estimated KW (demand and possibly change the kwh (energy) usage.

Working the Exception

1. **Open Exception** from the in-basket.
2. Open the **Installed Services** notebook - **Usage History Page**.
3. If there are multiple months with estimated demands, each of those higher estimated months will need to be rebilled using the actual KW (demand) value registered in the current month using the steps below.
 - ✦ **Cancel the bill(s)** that were estimated from the **Bill Comp** page. Use "Prorated" from the dropdown list.
 - ✦ **Use the actual current month KWH read to prorate and rebill the previous estimated usage.** If you can see from the meter reader notes that the kwh was an actual read, and only the kw wasn't read, then don't rebill the kwh.
 - ✦ **Use the actual current month KW (demand) to rebill the previous month(s) estimated demand.**
 - ✦ Open the **SA Billing Worksheet** and **double click on the read row to change the read and demand for the month(s) that are being rebilled.**
 - ✦ **Calculate the usage, and submit the worksheet.**
 - ✦ **Return to the Exception tab** once the rebilling is completed.
4. **Calculate the current months usage** in the **Usage Summary Page**.
5. **Approve the Exception** on the **Exception page**.
6. If rebilling multiple months, follow the same directions that you use currently for correspondence sent.

EXHIBIT 1

Installed Services Selected View Help

Meter Number is E26017 Meter Trail 383-88-09-42700

Next SA Window 02/06/2004 Thru 02/17/2004

Status	TOU	Source	Date	Begin	End	Billing Usage	Dmd Rtg
BILLED		NOP	12/08/1999	2964	4372	1,408.0	6,900
BILLED		NOP	11/08/1999	1716	2964	1,248.0	9,400
BILLED		REA	10/08/1999	0	1716	1,716.0	9,400
BILLED		SEP	09/15/1999	0	0	0.0	0.000
BILLED		SEP	09/15/1999	44262	44816	554.0	8,500
BILLED		MAN	09/09/1999	41383	44262	2,879.0	9,600
BILLED		REA	08/09/1999	39146	41383	2,237.0	8,400
BILLED		REA	07/12/1999	36657	39146	2,489.0	8,700
BILLED		REA	06/09/1999	35772	36657	886.0	9,500
BILLED	X	AUT	05/11/1999	34351	35772	1,421.0	4,300
BILLED	X	AUT	04/09/1999	32799	34351	1,552.0	4,700
BILLED	X	AUT	03/11/1999	31158	32799	1,641.0	5,000
BILLED		REA	02/09/1999	30177	31158	981.0	9,100

General
Usage History
Rel'ship
Profile

E26017, ON, N

Add Reading... Hide Void/Cancelled

Page 1 of 1

Start Inba... CS... Sec... Law... Mic... Cust... Inst... Serv... NUM 9:56 AM

EXHIBIT 2

Installed Services Selected Print View Help

Meter Number is C87111 Meter Trail 393-19-09-3600

Next SA Window 02/23/2004 Thu 03/02/2004

Status	TDU	Source	Date	Begin	End	Billing Usage	Dmd Rtg	Bld C
BILLED		NORMA	10/25/2001	88684	90174	1,490.0	5.900	
BILLED		NORMA	09/25/2001	86235	88684	2,449.0	6.600	
BILLED		NORMA	08/24/2001	83628	86235	2,607.0	6.300	
BILLED		NORMA	07/26/2001	81019	83628	0.0	6.200	
BILLED		NORMA	06/28/2001	78735	81019	2,284.0	6.300	
BILLED		NORMA	05/29/2001	76744	78735	1,991.0	6.800	
BILLED		NORMA	04/26/2001	75328	76744	0.0	5.800	
BILLED		OFFICE	03/28/2001	74407	75328	921.0	0.000	
BILLED		OFFICE	02/27/2001	73496	74407	912.0	3.900	
BILLED		AUTOM	01/25/2001	73019	73496	476.0	1.500	
BILLED		AUTOM	12/27/2000	72491	73019	528.0	1.600	
BILLED		AUTOM	11/27/2000	71874	72491	617.0	1.700	
BILLED		PROBE	10/25/2000	68984	71874	2,890.0	8.000	

General
Usage History
Ref'ship
Profile

Meter # C87111 02/23/2004

Add Reading Hide Void/Cancelled

Page 1 of 1

Start | [Icons] | Inbox... | CS W... | [Icons] | 9:18 AM

APS05701