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2004 JUN -9 P 2:31  
AZ CORP COMMISSION  
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TO: DOCKET  
FROM: Ernest Johnson  
Director  
Utilities Division

DATE: June 9, 2004

RE: STAFF REPORT ON CIRCUIT-BREAKER MECHANISMS: POSSIBLE  
UNINTENDED CONSEQUENCES, POTENTIAL INEQUITIES, AND IMPACTS  
ON ENERGY CONSERVATION  
E-01032C-00-0751  
G-01032A-02-0598  
E-01933A-02-0914  
E-01032C-02-0914  
G-01032A-02-0914  
G-01032E-03-0515

On March 23, 2004, the Arizona Corporation Commission (Commission) approved Decision No. 66861, which addressed a variety of issues related to a purchased gas adjustor surcharge in effect for UNS Gas, Inc. (UNS). In this decision the Commission directed Commission Staff (Staff) to:

“evaluate through a study any potential unintended consequences of the circuit-breaker mechanism. The study should analyze possible inequities resulting from the circuit-breaker mechanism, such as those which may exist between small and large natural gas users. The study should also address how the circuit-breaker mechanism may impact energy conservation, such as the price signals consumers are sent and their effect on conservation. The study should include options for potential action by the Commission to deal with these issues in the future. The study should be completed and filed with the Commission within 60 days of the date of this order.” (Finding of Fact Number 8)

The attached Staff Report discusses potential unintended consequences, possible inequities, and ways a circuit-breaker may impact energy conservation and then identifies possible courses of action to address these various issues.

Arizona Corporation Commission  
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# Staff Report on Circuit-Breaker Mechanisms: Possible Unintended Consequences, Potential Inequities, and Impacts on Energy Conservation

May 14, 2004

## Introduction

On March 23, 2004, the Arizona Corporation Commission (Commission) approved Decision No. 66861, which addressed a variety of issues related to a purchased gas adjustor surcharge in effect for UNS Gas, Inc. (UNS). In this decision the Commission directed Commission Staff (Staff) to:

“evaluate through a study any potential unintended consequences of the circuit-breaker mechanism. The study should analyze possible inequities resulting from the circuit-breaker mechanism, such as those which may exist between small and large natural gas users. The study should also address how the circuit-breaker mechanism may impact energy conservation, such as the price signals consumers are sent and their effect on conservation. The study should include options for potential action by the Commission to deal with these issues in the future. The study should be completed and filed with the Commission within 60 days of the date of this order.” (Finding of Fact Number 8)

This Staff Report will discuss potential unintended consequences, possible inequities, and ways a circuit-breaker may impact energy conservation and then will identify possible courses of action to address these various issues.

In general a circuit-breaker mechanism is a mechanism which at least to some extent reduces the rate impacts on customers of price and weather volatility such as may occur with unusually cold weather during the winter heating season. The Commission initially considered the circuit-breaker mechanism concept in the discussions leading to Decision No. 65384 (November 13, 2002), which addressed the undercollected purchased gas adjustor (PGA) bank balances of Citizens Utilities’ Northern Arizona and Santa Cruz Divisions. While a circuit-breaker mechanism was not adopted in that proceeding, the Commission did direct Staff to further investigate the possibility of using some form of circuit-breaker mechanism in the future. On September 3, 2003, Staff issued its “Staff Report on the Use of a Circuit-Breaker in Adjustor Mechanisms”. In Decision No. 66341 (September 30, 2003), the Commission approved revisions to the UNS surcharge and approved implementation of a circuit-breaker mechanism which exempted residential usage above 140 percent of average monthly residential consumption from December through March from the PGA surcharge.

## Current Circuit-Breaker Mechanism

In the UNS Gas proceedings regarding the PGA surcharge, the initial circuit-breaker mechanism used a 140 percent cutoff and applied from December through March. Decision No. 66861 reduced the cutoff to 125 percent of each month's average usage and extended its effectiveness to include the month of April. This order also exempted UNS Gas customers who were served under the CARES tariff from paying the PGA surcharge. Given that the UNS Gas PGA surcharge now expires at the end of October 2004, which is prior to when the circuit-breaker would be in effect during the 2004-2005 heating season, the last month the circuit-breaker mechanism impacts usage is April 2004. Under the currently effective UNS Gas circuit-breaker mechanism, the savings experienced by individual customers on usage above the cutoff is not tracked for each customer, but rather has the net effect of leaving a larger undercollected PGA bank balance than would have otherwise been in place at the end of the month the circuit-breaker mechanism is in place.

## Potential Unintended Consequences of Circuit-Breaker Mechanism

Any time there are changes in the structure of customer rates for utility service, there is some potential for those changes to have unforeseen and unintended consequences. Of course, by their very nature, such unforeseen and unintended consequences are difficult to identify prior to their occurring, but this section of the Staff Report attempts to identify a number of possible consequences of implementing a circuit-breaker mechanism. It should be noted that the issues discussed in the following sections of the Staff Report also in some cases could be considered to be unintended consequences.

### 1. Additional Customer Bill Complication and Resultant Confusion

Many utility customers already have a difficult time understanding the various components of their utility bill. Addition of the circuit-breaker on top of the existing components such as the customer charge, margin rates, and gas cost/PGA components, adds one more piece of rate structure complexity to what is already a murky area for many customers.

*Possible Courses of Action:* While some level of additional customer confusion is probably inevitable, customer education can reduce such confusion and to the extent circuit-breakers are used on a regular basis, at least some customers are likely to become more familiar with the concept. Also, the Commission and the utility can work together to ensure that the circuit-breaker is reflected on customer bills in the clearest fashion.

### 2. Additional Costs to Utility of Reprogramming Billing Systems

Implementation of a circuit-breaker mechanism would require changes to the utility's billing system, which would likely entail some level of reprogramming or other additional cost. The more complicated the circuit-breaker structure, the more additional cost there would likely be. For example, UNS' current circuit-breaker mechanism structure would likely be less costly to

reprogram than for a circuit-breaker mechanism which would track individual deferrals and apply them to individual bills during summer months.

*Possible Courses of Action:* Some level of reprogramming costs is likely unavoidable, but providing the utility with a good amount of lead time for such reprogramming would probably help. Additionally, long term, the Commission could encourage utilities to have billing systems which would have the necessary flexibility to implement a circuit-breaker mechanism at minimal cost.

### 3. A Circuit-Breaker Mechanism Could be Considered a Form of Mandated Levelized Billing

The circuit-breaker mechanism, depending to some extent on how it is structured, likely involves some shifting of the cost of natural gas service for customers from winter heating season months to summer months. Therefore the general nature of the mechanism is somewhat similar to a levelized billing program under which a customer pays the same amount each month throughout the year. It is possible that certain customers might not wish to have their bills artificially reduced during the winter heating season months, only to be made up during the summer months.

*Possible Courses of Action:* Making the circuit-breaker mechanism optional for customers would largely defeat its purpose and would likely result in the mechanism not reaching many of the customers it was intended for, so there does not appear to be a clear way to address this issue. But in principal, implementation of a circuit-breaker mechanism is just another form of rate design, albeit temporary, and the Commission makes a wide variety of rate design decisions which are mandatorily applied to utility customers.

### 4. A Circuit-Breaker Mechanism Could Create False Expectations for Customer Bill Savings

While a customers' bills may be reduced during the peak heating season months under the circuit-breaker mechanism, as a whole customers will pay the same overall bills, with costs somehow deferred to a later date to be paid. It is possible customers could see their lower winter heating season bills resulting from the circuit-breaker mechanism and erroneously assume that costs will be lower overall and not consider that the deferred costs will have to be paid sometime in the near future. This effect is likely to be more pronounced the more aggressively the circuit-breaker mechanism is designed to have a sizable winter heating bill impact.

*Possible Courses of Action:* As part of efforts to educate customers regarding the circuit-breaker mechanism, customers could be informed that the circuit-breaker mechanism results in a shifting of costs from the winter heating season, but that those costs will have to be paid in the near future.

### 5. A Circuit-Breaker Mechanism Would Reduce Some Customer Bills Even During an Unusually Warm Heating Season

A circuit-breaker mechanism is generally targeted to help relieve customers from very large swings in their bills, which can result from a combination of higher rates and colder than normal weather. However, under the current circuit-breaker mechanism, even if a given month was much warmer than normal, resulting in generally lower usage across all customers, some very high usage customers would still be above the threshold for the circuit-breaker mechanism that month, resulting in bill reductions for those very high use customers. It could be argued that the need for the circuit-breaker mechanism is greatly reduced if not eliminated when there is much warmer weather than normal during the winter heating season.

*Possible Courses of Action:* This issue is challenging to deal with, as there is no good way of predicting ahead of time what the weather during the heating season months will be. One possible option would be for the circuit-breaker to work off of changes in individual customer usage in a given month from one year to the next. While this might be challenging to implement, it would target circuit-breaker savings toward customers who see large usage increases from one year to the next.

### Possible Inequities Resulting from the Circuit-Breaker Mechanism

By its nature a circuit-breaker mechanism entails some shifting of costs away from customer bills during winter heating months. The way the circuit-breaker mechanism is structured greatly influences whether inequities from cost shifting may exist in a temporal form, between customer classes, or within customer classes. Possible Courses of Action are discussed at the end of this section of the report, as many of the possible inequities overlap one another in some ways.

#### 1. Temporal Inequities

Circuit-breaker mechanism structures generally result in the shifting of costs away from the winter heating season toward the summer heating season. If costs are tracked on an individual customer basis, meaning that to the extent an individual customer defers some costs in the winter heating season they would pay those same costs at a later time, then the only temporal issue might be concerns individual customers have with how their bills are distributed throughout the year. If individual customer deferrals are not tracked, then it appears likely that some cross-subsidization will occur. In such a case, customers whose usage pattern is more weighted toward summer usage than the utility system as a whole might be inequitably burdened with more costs than they otherwise would have.

#### 2. Inequities Between Customer Classes

The circuit-breaker mechanism is targeted at the residential customer class, and reasonably so, as it would be difficult if not impossible to construct a circuit-breaker mechanism for the very diverse commercial and industrial classes. Working from the premise that the circuit-breaker mechanism is only applied to residential customers, the question becomes whether the application of the circuit-breaker mechanism to the residential customer class somehow impacts the rates paid by other customer classes.

If the circuit-breaker mechanism provides deferrals to residential customers and there is no similar deferral for commercial and industrial customers, then the commercial and industrial customers would be to some extent subsidizing the residential class, unless the deferrals are tracked by customer or for the residential class as a whole and then recovered from those same customers or specifically from the residential class.

### 3. Inequities Within a Customer Class

Since the circuit-breaker mechanism applies to residential customers, this would be the main customer class which might see some inequities within the class, although depending on how the circuit-breaker is structured, some commercial/industrial customers could see more of an impact from temporal inequities and/or inequities between customer classes resulting from a circuit-breaker mechanism.

Within the residential customer class, the main source of potential inequities is between high and low use customers. Under the current UNS circuit-breaker mechanism, only high usage customers benefit from the circuit-breaker mechanism. For low use residential customers, they do not receive a benefit from the circuit-breaker mechanism, and to the extent the PGA surcharge is extended one or more months to make up for the circuit-breaker related deferral of costs, the low usage residential customers actually end up paying more than if the circuit-breaker mechanism did not exist.

*Possible Courses of Action:* To avoid possible temporal, inter-class, and intra-class inequities, any costs deferrals as a result of the circuit-breaker mechanism would need to be tracked and then subsequently recovered from the same individual customers who received the cost deferrals to begin with. A lesser option would be to track cost deferrals and isolate them to the residential class for recovery, but this option would not address intra-class inequities and to some extent temporal inequities. It appears likely that utilities will resist such more detailed tracking of costs, as it will likely create additional billing system programming costs and could possibly be difficult to even do given the limitations of some billing systems. However, there may be opportunities to minimize such problems by having utilities ensure that when they upgrade their billing systems that the new systems be capable of handling various circuit-breaker features.

### Circuit-Breaker Impacts on Energy Conservation

Implementation of a circuit-breaker mechanism for usage above a certain level will necessarily create a declining block rate structure while the circuit-breaker mechanism is in effect. A common concern with declining block rate structures is that by paying less for higher usage increments of service, customers may be less inclined to take measures and actions to limit or reduce their energy consumption. To the extent such a disincentive is created for energy conservation by implementing a circuit-breaker mechanism, it could be considered to be an undesirable side effect in an era of concern about limited energy supplies and high energy prices. An important factor is the size of the surcharge which would be avoided under a circuit-breaker mechanism. If the surcharge were small, the resulting declining block rate structure would be

very gradual, with little potential for discouraging energy conservation. However, it seems likely that the circuit-breaker mechanism would generally be implemented when there is a larger surcharge, which would mean a larger differential between the rate blocks would be seen.

Viewed in isolation, a declining block rate structure seems likely to influence at least a small percentage of customers to consume more natural gas. The stronger the slope of the declining block rate structure, the greater the likely influence. And to the extent a circuit-breaker mechanism was implemented for a utility whose base rate(s) already contain a declining block structure, the differential among the various blocks is even more pronounced. However, a number of factors argue that the implementation of a circuit-breaker mechanism, while not encouraging energy conservation, would also likely lead to little or no additional natural gas consumption. The combination of all these factors is likely to provide the customer a greater signal regarding energy conservation, but the individual impact of the circuit-breaker mechanism on this signal is likely to be largely drowned out. These factors include:

- A large percentage of natural gas consumers do not track their energy consumption in sufficient detail to be aware of or take into consideration the ability to pay a lower rate beyond the given threshold set by the circuit-breaker mechanism. This is particularly true since the threshold changes every month based on different average historical customer consumption each month.
- The circuit-breaker mechanism would generally be put in place at times when natural gas market prices are displaying significant volatility. While the existing PGA mechanism softens the impacts of such market price swings on customers, nevertheless, customers would likely see noticeable shifts in the monthly PGA rate during the same time period a circuit-breaker mechanism would be implemented.
- Weather is a significant unknown which impacts both usage levels and prices. A warmer or colder than normal month and its impacts on natural gas usage is likely to be more noticeable to most customers than the declining block rate design and its impacts.
- Rate cases often result in increases and/or decreases to the overall rates and the rate structure of the given utility. Such rate increases and changes in rate structures could in some cases be another source of significant change to the customer's overall natural gas bill.
- In times of consistently rising natural gas prices, the customer may actually be paying a higher per therm rate, even for therms exempted from the PGA surcharge, than they did 2 or 3 years prior. In such a case, it seems likely that the customer will sense a general need to conserve usage, regardless of whether the usage is above or below the circuit-breaker threshold.
- Similarly, except for the case of extremely large PGA surcharges, the differential between the total per therm rate paid by a customer for usage above and below the circuit-breaker threshold does not appear to be significantly large to be likely to cause customers to try to increase usage once their usage exceeds the threshold. For example, if a customer is paying \$1.00 per therm underneath the threshold and \$0.90 per therm above the threshold, the \$0.10 per therm of savings on usage above the threshold is still a small dollar amount in comparison to the rate the customer must still pay for every therm used above the threshold (\$0.90 per therm).

In summary there are a variety of factors, many of which are difficult or impossible to predict, which have a significant impact on customers' natural gas bills. Because these factors cause such fluctuation in customers' natural gas bills, it does not seem likely that use of a circuit-breaker mechanism and the resulting declining block rate structure would have a noticeable impact on customers' decisions to conserve natural gas or not.

*Possible Courses of Action:* There is little that can be done in designing the circuit-breaker mechanism to avoid its potential impact on energy conservation, to the extent it is believed there is such an impact. The nature of the circuit-breaker mechanism structure is that the latter usage block will have a lower price than the first usage block. One possible course of action is to address declining block and related rate structure issues as each utility comes before the Commission in its periodic rate proceedings.

### Conclusions

The circuit-breaker mechanism, as with any action taken to adjust the structure of rates paid by customers, has a variety of impacts, including likely some which are unforeseen. This report has attempted to identify various possible unexpected consequences, potential inequities, and impacts on energy conservation of the circuit-breaker mechanism. This report has also attempted to identify possible actions which could be taken to address, at least to some extent, the issues identified in this report. The circuit-breaker mechanism is one of a number of tools which the Commission can adopt to address concerns regarding the level and structure of the rates customers pay. The circuit-breaker mechanism should be considered, along with other possible options, in addressing customer bill volatility and related issues.

1 SERVICE LIST FOR: UNS Gas, Inc.  
2 DOCKET NOS. E-01032C-00-0751, et al.

3 Mr. Thomas H. Campbell  
4 Mr. Michael T. Hallam  
40 North Central Avenue  
5 Phoenix, Arizona 85007  
6 Attorney for UNS Gas and  
Citizens Communications Company

7 Ms. Deborah R. Scott  
8 Unisource Energy Services  
One South Church Street, Suite 200  
9 Tucson, Arizona 85702

10 Mr. L. Russell Mitten  
11 Citizens Communications Company  
Three High Ridge Park  
12 Stamford, Connecticut 06905

13 Mr. Scott Wakefield  
14 Mr. Daniel W. Pozefsky  
RUCO  
15 1110 West Washington Street, Suite 220  
Phoenix, Arizona 85007

16 Mr. John White  
17 Deputy County Attorney  
P.O. Box 7000  
18 Kingman, Arizona 86402

19 Mr. Robert A. Taylor  
20 City Attorney  
City of Kingman  
21 310 North Fourth Street  
Kingman, Arizona 86401

22 Mr. Gary Smith  
23 Citizens Communications Company  
24 2901 West Shamrell Boulevard, Suite 110  
Flagstaff, Arizona 86001

25 Mr. Raymond Mason  
26 Director, Corporate Regulatory Affairs  
27 3 High Ridge Park  
Stamford, Connecticut 06905

28

1 Mr. Dennis R. Nelson  
UniSource Energy Services  
2 2901 West Shamrell Boulevard, Suite 110  
3 Flagstaff, Arizona 86001-9402

4 Mr. Robert J. Metli  
Cheifetz & Iannitelli, P.C.  
5 3238 North 16th Street  
6 Phoenix, Arizona 85016

7 Mr. John D. Draghi  
Susan Mikes Doherty  
8 Huber, Lawrence & Abell  
605 Third Avenue  
9 New York, New York 10158

10 Mr. Raymond S. Heyman  
Michael W. Patten  
11 ROSHKA HEYMAN & DeWULF  
12 400 East Van Buren Street, Suite 800  
Phoenix, Arizona 85004  
13 Attorneys for Mohave and Santa Cruz Counties

14 Mr. Jose L. Machado  
777 North Grand Avenue  
15 Nogales, Arizona 85621  
16 Attorney for City of Nogales, AZ

17 Mr. Walter W. Meek  
AUIA  
18 2100 North Central Avenue, Suite 210  
19 Phoenix, Arizona 85004

20 Ms. Holly J. Hawn  
Santa Cruz Deputy County Attorney  
21 2150 North Congress Drive, Suite 201  
22 Nogales, Arizona 85621

23 Mr. Marshall Magruder  
Ms. Lucy Magruder  
24 P.O. Box 1267  
Tubac, Arizona 85646-1267  
25

26 Mr. Hugh Holub, Esq.  
118 North Mastick Way, Suite 400  
27 Nogales, Arizona 85621-4117  
28

1 Mr. Andrew Bettwy, Esq.  
Southwest Gas Corporation  
2 5241 West Spring Mountain  
3 P.O. Box 98510  
Las Vegas, Nevada 89193-8510

4 Mr. Nicholas Enoch, Esq.  
5 349 North Fourth Avenue  
Phoenix, Arizona 85003-1505

6 Mr. Ernest G. Johnson  
7 Director, Utilities Division  
8 Arizona Corporation Commission  
1200 West Washington  
9 Phoenix, Arizona 85007

10 Mr. Christopher C. Kempley  
Chief Counsel  
11 Arizona Corporation Commission  
12 1200 West Washington  
Phoenix, Arizona 85007

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