Xcel Energy℠

PUBLIC SERVICE COMPANY

RE: THE TARIFF SHEETS FILED BY PUBLIC SERVICE COMPANY OF COLORADO WITH ADVICE LETTER NO. 1495 – ELECTRIC.

DOCKET NO. _____

DIRECT TESTIMONY AND EXHIBITS

NOVEMBER 1, 2007

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RE: THE TARIFF SHEETS FILED BY PUBLIC SERVICE COMPANY OF COLORADO WITH ADVICE LETTER NO. 1495 – ELECTRIC.

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DIRECT TESTIMONY AND EXHIBITS

OF

SCOTT B. BROCKETT

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF COLORADO
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INDEX

SECTION PAGE

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SCOTT B. BROCKETT

I. INTRODUCTION AND STATEMENT OF PURPOSE

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Scott B. Brockett. My business address is 1225 Seventeenth Street, Suite 1000, Denver, Colorado, 80202.

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

A. I am employed by Xcel Energy Services Inc., the service company subsidiary of Xcel Energy Inc., the registered public utility holding company parent of Public Service Company of Colorado. My title is Manager, Pricing and Planning, Governmental and Regulatory Affairs Department. My primary responsibilities are to provide pricing and regulatory support for the Colorado electric, gas and steam operations.

Q. ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS DOCKET?

A. I am testifying on behalf of Public Service Company of Colorado ("Public Service" or "the Company").

Q. HAVE YOU INCLUDED A STATEMENT OF YOUR QUALIFICATIONS, DUTIES AND RESPONSIBILITIES?

A. Yes. A description of my qualifications, duties and responsibilities is attached as Attachment A.

Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?

A. The purpose of my testimony is to sponsor and support, in conjunction with other Company witnesses, the Company's proposed changes to its Interruptible Service Option Credit (ISOC) program. I will also explain how the Company proposes to collect its ISOC costs. Finally, I will propose an ISOC financial incentive based on the net benefits to nonparticipating customers.

Q. IS THE COMPANY PROPOSING TO RECOVER ANY SPECIFIC ISOC PROGRAM COSTS OR FINANCIAL INCENTIVES IN THIS PROCEEDING?

A. No. I will explain how the Company proposes to recover its costs and financial incentives commencing January 1, 2009.

Q. WHO ARE THE OTHER COMPANY WITNESSES IN THIS PROCEEDING?

A. Public Service is offering the testimony of Timothy J. Sheesley and Alan Taylor. Mr. Sheesley provides the basis for many of the program revisions the Company is proposing in this proceeding, and is sponsoring the tariff revisions that capture all of the changes that he, Mr. Taylor and I are proposing. Mr. Taylor is sponsoring the company's derivation of the avoided costs attributable to the various ISOC options.

II. BACKGROUND ON CURRENT ISOC PROGRAM

Q. PLEASE SUMMARIZE THE CURRENT ISOC PROGRAM.

A. The current ISOC program allows customers to designate a set amount of firm load at a given site. The remaining load is considered to be interruptible.

The customer's Contract Interruptible Load ("CIL") at any one site must be at least 500 kW. Customers can choose among four caps on their maximum annual number of interruptible hours. They can also choose to receive eight hours, one hour, or less than 10 minutes notice of an impending interruption. Each year the Company can interrupt customers up to their respective maximum number of interruptible hours. The Company calls these interruptions when system reliability is jeopardized or the wholesale price of electricity is relatively high.

In return for their willingness to curtail load when curtailments are most valuable to the Company and its firm customers, ISOC customers receive a monthly credit. The credit is expressed as a monthly payment per kW of the customer's interruptible load, and varies depending on the maximum hours of interruption and required notice the customer selects. The credit is seasonally differentiated to reflect the greater value of summer interruptions.

Q. WHAT IS THE BASIS FOR THE CREDITS PAID TO CUSTOMERS UNDER THE CURRENT PROGRAM?

A. The credits paid under the current program were based on the costs the Company estimated it would avoid by securing interruptible load. The interruptible loads of customers requesting at least one hour of notice or eight hours of notice help the utility meet its generation reserve requirement for planning purposes. Consequently, the sum of their 12 monthly credits is based on (but is not equivalent to) the annual carrying charge of the least-cost capacity resource – a gas-fired peaking unit.

A second, relatively small portion of the credit is based on the estimated reduction in firm customers' energy costs. This portion of the credit is estimated by multiplying the projected hours of interruption by the difference between the running cost of the avoided generation unit and the energy charges the interruptible customers would have paid in the absence of the program.

Q. YOU HAVE EXPLAINED THAT THE ISOC CREDITS FOR CUSTOMERS REQUIRING AT LEAST ONE HOUR OF NOTICE ARE BASED ON THE CARRYING COST OF A PEAKING UNIT. IS THE AVOIDED COST ATTRIBUTABLE TO ISOC LOAD CURRENTLY SET AT 100 PERCENT OF THIS CARRYING COST?

A. No. Under the current ISOC tariff, the credits paid to customers are based on a fraction of this carrying charge of a conventional peaking unit. This adjustment reflects the lesser value of interruptible load in terms of ensuring system reliability. A peaking unit can be dispatched at the utility's discretion – subject to maintenance requirements and forced outages. Because the hours of interruption for ISOC customers are capped, the reliability value of interruptible load is less than the value of the analogous supply-side resource. In other words, the avoided cost of interruptible load is less than the carrying cost of the supply-side option. (The credit to customers requiring eight hours of notice also reflects the reduced value inherent with longer lead times.)

Q. IS A SIMILAR APPROACH USED TO ESTABLISH THE CREDIT FOR CUSTOMERS RECEIVING LESS THAN 10 MINUTES OF NOTICE?

A. Yes. The credits for customers on either notice option are based on the avoided cost of the comparable supply-side resource and the energy savings to nonparticipating customers. The difference is that loads that can be curtailed in less than 10 minutes can be treated as operating reserves – or reserves the utility can call upon quickly in response to critical immediate needs resulting from generation or transmission outages or other system emergencies. Consequently, the credit for customers willing to accept less than 10–minute notice is based on the annual carrying cost of a "quick-start" generating unit. Because the cost of a quick-start unit is greater than the cost of a traditional peaking unit, 10-minute notice customers receive a higher credit.

III. ASSESSMENT OF CURRENT ISOC PROGRAM

Q. WHAT CRITERIA CAN BE USED TO EVALUATE WHETHER THE CURRENT PROGRAM IS ACHIEVING ITS INTENDED GOAL?

A. Put simply, an interruptible program should be designed, based on the best information available to the utility, to ensure that nonparticipating customers receive a benefit in the form of lower system costs. But achieving this goal is difficult. A credit set at 100 percent of avoided cost might attract a lot of load; but firm customers would realize few, if any, financial benefits. A credit set much lower than the avoided cost would provide firm customers large

financial benefits per MW of interruptible load, but would probably not attract much load.

Given this trade-off, it is difficult to determine if any given interruptible program is "optimal." Nonetheless, a good program should attempt to satisfy the following criteria. First, the various service options and the corresponding bill savings must be acceptable to customers to attract potential load. Second, the value of each option should be carefully estimated to ensure that other customers benefit. Third, the interruptible program should be relatively easy to administer and should be clearly specified and explained to customers. Fourth, service options of little value or interest to customers should be eliminated to simplify the tariff and facilitate its administration.

Q. IS THE CURRENT ISOC PROGRAM MEETING THE CRITERIA EXPLAINED ABOVE?

A. The Company believes the basic framework of the program is sound, but some refinements are necessary. Specifically, the Company is concerned about the following aspects of the program:

- The program has attracted only about 120 MW of load to date, which represents less than 2 percent of the Company's 2007 system peak load.
- The levels of the current credits should be revisited to update the cost reductions allowed by interruptible load and ensure that other customers adequately share in the savings.

- One current service option appears to provide little value and has not generated customer interest.

I discuss below how the Company's filing addresses each of these concerns.

IV. BARRIERS TO PROGRAM PARTICIPATION

Q. WHY HAS THE CURRENT PROGRAM NOT ATTRACTED MORE LOAD?

A. The attractiveness of an interruptible program depends primarily on two factors: the financial savings the customer can realize and the extent to which the program limits the customer's inconvenience. The challenge is to identify program options that limit customer inconvenience, but still provide enough value to both attract interruptible load and benefit firm customers.

Q. HAS THE COMPANY ATTEMPTED TO IDENTIFY BARRIERS TO CUSTOMER ENROLLMENT?

A. Yes. The Company has evaluated the current features of the program and solicited feedback from its large commercial and industrial (C&I) customers in an attempt to identify program barriers and areas for potential improvement.

Q. PLEASE EXPLAIN HOW YOU SOLICITED INPUT FROM C&I CUSTOMERS.

A. The Company's market research consisted of two initiatives. The Company first convened Focus Groups with 16 large customers (at least 300 kW) to better understand customer attitudes towards interruptible service. The Company subsequently hired The Praxi Group to survey 175 mid- to large-

size customers (at least 100 kW) to test the attractiveness or importance of various program features. Sixty-four customers responded to the survey.

I will cite the relevant findings from this market research when discussing the proposed program revisions below.

Q. WHAT WERE THE RESULTS OF THE COMPANY'S RESEARCH AND EVALUATION?

A. Several conclusions can be drawn. First, the minimum interruptible load of 500 kW required under the current tariff is a significant barrier. This requirement alone limits the population of eligible load to about 2,200 MW (on a noncoincident basis). A lower limit would expand the pool of eligible customers.

Second, customers greatly value the option of buying through interruptions. About 50 percent of the survey respondents would be either "Somewhat More Interested" or "Much More Interested" in a program that included a buy-through option. The current ISOC program includes a buy-through option. This feature should be retained.

Third, some customers would prefer more flexibility as to how to implement their load reductions. The current tariff requires Public Service to exercise effective physical control over the interruptible loads of customers opting for less than 10-minute notice. About 43 percent of the respondents would be either "Somewhat More Interested" or "Much More Interested" if the Company would effect these interruptions by signaling the customer's Energy Management System ("EMS"). The customer's EMS would be programmed

to reduce load automatically to the required firm levels, based on predetermined settings.

Fourth, some customers would prefer some limits on the timing and duration of interruptions. The current program requires that the duration of any one interruption must be four hours, but does not set any limits on the frequency or maximum lengths of interruptions. The only limit is the customer's annual number of interruptible hours. Some customers would prefer to limit or space out interruptions to reduce the inconvenience to their operations. About 34 percent of the survey respondents indicated that they would be "Somewhat More Interested" or "Much More Interested" in a program that would limit the interruptions to 4 hours in any 24-hour rolling period.

Q. WHAT PROGRAM CHANGES IS THE COMPANY PROPOSING TO REDUCE THESE RESTRICTIONS ON PARTICIPATION?

A. The Company proposes five primary changes in response to both the program evaluation summarized above and input from existing ISOC customers.

First, the Company proposes to lower the minimum size threshold from 500 kW to 300 kW. This change alone will increase the amount of eligible load (on a noncoincident basis) from about 2,200 MW to about 2,700 MW, and the number of eligible customers (based on meter count) from about 1,400 to about 2,600.

Second, the Company proposes to allow customers to opt for no more than 4 hours of interruption in any 24-hour period. This option will accommodate customers for whom long interruptions concentrated in short periods are a significant barrier to participation. However, the credits for customers selecting this option will be reduced to reflect the lower value to the Company of restricting the timing of interruptions. Customers who are willing to accept no such restrictions will receive a higher credit.

Third, the Company is proposing to allow customers agreeing to less than 10-minute notice to use their EMS to comply with their contractual requirements.

Fourth, the Company is proposing to allow customers more flexibility in terms of enrolling in the program and revising the levels (kW) of their interruptible loads.

Fifth, the Company is proposing to allow customers the option of accepting interruptions of less than four hours.

Mr. Sheesley will explain how these primary program changes, as well as other changes that he will sponsor and defend, will be administered and reflected in the ISOC tariff.

V. LEVELS OF INTERRUPTIBLE CREDITS

Q. PLEASE EXPLAIN WHY THE COMPANY IS REVISING THE LEVELS OF ITS INTERRUPTIBLE CREDITS?

A. The starting point for deriving the proposed interruptible credits is the same as was used to derive the current credits: The Company will continue to base

the credits on the estimated cost savings (the avoided costs) per kW of interruptible load. But the Company is proposing several revisions to its approach to estimating these avoided costs, which are fully explained by Mr. Taylor. Apart from these conceptual changes, the Company is also updating the avoided-cost estimates to reflect changes in the Company's system loads and generation resources and changes in the costs of the relevant supply-side alternatives.

Moreover, the avoided costs associated with the new service option explained above – the limit on interruptions to 4 hours in a 24-hour period – must also be estimated.

Finally, as I mentioned earlier, the Company is proposing to eliminate the requirement that each interruption be at least four hours. Customers could choose to retain the four-hour minimum in return for a slightly lower credit. Consequently, the avoided costs with and without the four-hour minimum must be estimated.

Mr. Taylor will explain and sponsor the derivation of avoided costs for each service option (except for the adjustments attributable to sub-transmission losses and energy savings, which Mr. Sheesley will sponsor).

Q. IS THE COMPANY PROPOSING TO SET THE ISOC CREDITS AT 100 PERCENT OF THE AVOIDED COSTS?

A. No. This is another change the Company is proposing. The proposed credits are set at 80 percent of the avoided costs. I will refer to this percentage hereafter as the "Credit Adjustment Factor."

Q. WHY IS THE COMPANY PROPOSING TO SET THE CREDITS AT LESS THAN THE ESTIMATED AVOIDED COSTS?

A. The ISOC program should provide financial benefits to nonparticipating firm customers. Since the avoided cost can never be estimated with 100 percent certainty, setting the credit below the full avoided cost provides greater assurance that non-participating customers will benefit. I will explain how the Company chose a Credit Adjustment Factor of 80 percent later in my testimony.

Q. DOES THIS PROPOSED REDUCTION TO THE CREDIT UNFAIRLY DISADVANTAGE ISOC CUSTOMERS?

A. No. Mr. Taylor's estimates of avoided costs are higher than the avoided costs used to derive the current ISOC credits. Consequently, even after applying the Credit Adjustment Factor the proposed ISOC credits are higher than their current levels (for the same service options).

Q. HOW DID THE COMPANY ARRIVE AT A CREDIT ADJUSTMENT FACTOR OF 80 PERCENT?

A. The Company's goal was to reduce the credit to a level such that nonparticipants would benefit even in the absence of any energy savings under the program and even after the application of the Company's proposed financial incentive (explained later in my testimony). In other words, the Credit Adjustment Factor should be set to ensure financial benefits to other customers based solely on the reliability or capacity value of interruptible load.

According to the analysis of Mr. Taylor and Mr. Sheesley, the percentage of the full ISOC avoided cost attributable to energy savings ranges from 0.6 percent to 4.5 percent, depending on the service option the customer selects. The derivation of this range is provided as Exhibit No. SBB-1. As I discuss later in my testimony, the Company's proposed financial incentive represents another 10 percent of the avoided costs. The proposed Credit Adjustment Factor would ensure that nonparticipants benefit even if there were no energy savings and even after the payout of the proposed financial incentive. This Credit Adjustment Factor would be applied to the avoided cost of each service option to yield the proposed credits.

Q. WHAT ARE THE PROPOSED CREDITS FOR EACH SERVICE OPTION UNDER THE APPROACH OUTLINED ABOVE?

A. The average monthly credits per kW for each service option are provided as Exhibit No. SBB-2. Mr. Sheesley will sponsor the specific formula the Company is proposing to derive the ISOC credit for a particular load and service option.

Q. EARLIER YOU STATED THAT THE ISOC PROGRAM SHOULD ENSURE THAT NONPARTICIPANTS RECEIVE A BENEFIT IN THE FORM OF LOWER SYSTEM COSTS. WHAT CRITERIA SHOULD BE APPLIED TO DETERMINE WHETHER THE UTILITY HAS ADMINISTERED THE PROGRAM TO MEET THIS GOAL?

A. The Company believes it should adhere to the tariff provisions and call capacity and contingency interruptions when there is a need to reduce load

for reliability reasons. The Company also believes it should strive to call economic interruptions when energy costs are relatively high in order to obtain additional benefits for nonparticipants in the form of lower energy costs.

But it is important to remember that optimizing the use of economic interruptions is necessarily a matter of judgment. All ISOC customers have limits on their annual hours of interruption. If the Company calls a four-hour economic interruption in July to lower energy costs to nonpartipants, then there are four fewer hours to use later in the year for reliability or economic reasons. This "opportunity cost" of using up hours early in the year means that the calling of economic interruptions is necessarily a matter of judgment. Consequently, a litmus test of using all or even the vast majority of hours is not necessarily an optimal strategy, unless the Company uses a disproportionate number of hours at the end of the year.

Q. SHOULD PUBLIC SERVICE BE HELD TO THE STANDARD OF EXHAUSTING ALL POTENTIAL HOURS OF CUSTOMER INTERRUPTION EACH YEAR?

A. The Company does not believe that exhausting all potential hours every year is an appropriate standard, because it is in the best interests of nonparticipants to bank some hours as an insurance policy against unforeseen reliability or economic issues. The value of banking hours to hedge against potential reliability issues later in the year far outweighs the benefits of reducing energy costs today, except on those rare occasions when

the market price of energy is very high. (In many such cases the Company would be calling capacity or contingency interruptions anyway, so the decision as to whether to call an economic interruption would be moot.) Stated differently, the reliability benefits constitute almost all of the value of the ISOC program. The energy-related benefits are the "tail of the dog," as shown in Exhibit No. SBB-1. Moreover, as explained above, the Company is pricing the ISOC credits to ensure benefits to nonparticipants even in the absence of any energy savings.

Nonetheless, the Company recognizes that the Commission has expressed a preference that Public Service use as many hours as possible. Consequently, the Company proposes to, if necessary, call a disproportionate number of interruptions at the end of the year to ensure that it exhausts as many of the potential hours as possible. That way the Company can reserve the much more important value of the ISOC hedge, while still exhausting as many of the potential energy-related benefits as possible. However, there is no guarantee that the incremental energy cost during the latter part of December will exceed the ECA that interruptible customers would pay anyway. In such cases it would not make sense to call economic interruptions.

Given all of these considerations, the Company suggests that there be a rebuttable presumption of prudency if the Company uses at least 80 percent of ISOC customers' potential annual hours of interruption. If the Company

falls short of this standard, then it would have an obligation to justify the actions it took during the course of the year.

VI. ELIMINATION OF SERVICE OPTIONS

Q. IS THE COMPANY PROPOSING TO ELIMINATE ANY SERVICE OPTIONS?

A. Yes. The current ISOC tariff allows customers to cap their annual hours of interruption at 40, 80, 160 or 200 hours. To date, no customer has selected the 200-hour option. In addition, Mr. Taylor's analysis demonstrates that most of the reliability value of interruptible load can be obtained with a cap of 160 hours. The reliability benefit to the system of the additional 40 hours is relatively small. Consequently, the Company proposes to eliminate the 200-hour option.

The Company also proposes to eliminate the 8-hour notice option, due to a lack of customer interest. Mr. Sheesley discusses this revision in his testimony.

VII. ESTIMATED IMPACT OF PROGRAM CHANGES ON TOTAL ISOC LOAD

Q. DOES THE COMPANY ANTICIPATE ADDING MORE ISOC LOAD AS A RESULT OF THE PROPOSED CHANGES TO THE CREDIT LEVELS, SERVICE OFERING AND CONDITIONS OF SERVICE?

A. Yes. The Company believes that the combined impact of the revisions proposed in this proceeding will be a gradual increase in ISOC load. By 2020 the Company anticipates total ISOC load of about 243 MW, which is over

twice the current ISOC load. Of course, it is difficult to predict accurately customer response to the revised program. As we gain more experience the Company will refine its load projections.

VIII. COST RECOVERY AND INCENTIVES RELATED TO ISOC

Q. HOW DOES THE COMPANY PROPOSE TO RECOVER ITS ISOC COSTS?

A. Any direct costs of implementing the program will be recovered through the fixed charge assessed on ISOC customers. Mr. Sheesley will discuss the tariff provisions governing the collection of direct program implementation costs in his testimony.

The Company proposes to recover its forecasted ISOC credits annually through the Demand Side Management Cost Adjustment ("DSMCA"), consistent with the Company's proposal for the recovery of its energy-efficiency and Savers Switch costs. In other words, the forecasted 2009 ISOC credits would be recovered from January 1, 2009, through December 31, 2009. The Company also requests to recover through the DSMCA any incremental marketing costs attributable to the ISOC program. The Company would request such recovery through an advice letter filed to recover both its forecasted DSM and ISOC program costs for the following year. An illustrative filing schedule, illustrative cost-recovery example for all costs collected through the DSMCA (including ISOC costs and financial incentives) and revised DSMCA tariff are provided as exhibits to my direct testimony in the Company's DSM petition filed on October 31, 2007.

Q. WOULD THE COLLECTION OF MARKETING COSTS FROM NONPARTICIPANTS THROUGH THE DSMCA RESULT IN NONPARTICIPANTS PAYING MORE FOR THE PROGRAM THAN THEIR BENEFITS IN TERMS OF AVOIDED COSTS?

A. The Company is seeking the collection of only the annual incremental costs associated with ISOC marketing. Public Service is not anticipating that these incremental costs will exceed the annual net benefits to nonparticipants. Nonetheless, the Company would agree to cap its collection of annual ISOC marketing costs at 5 percent of the total ISOC credits for the same year. Since the sum of the ISOC credits and financial incentive are set at 90 percent of avoided costs, nonparticipants would still benefit by at least 5 percent of the avoided costs even after absorbing the marketing costs.

Q. DOES THE COMPANY PROPOSE TO EARN A FINANCIAL INCENTIVE ON ITS ISOC PROGRAM?

A. Yes. The Company proposes to earn a financial incentive annually equal to 12.5 percent of the total ISOC credits, beginning with the 2009 ISOC credits.

Q. WHAT IS THE BASIS FOR THE PROPOSED INCENTIVE?

A. I explained earlier that the Company proposes to set the ISOC credit at 80 percent of the avoided cost. The result is that the costs of serving other customers should decline by about 20 percent of the annual avoided costs attributable to the ISOC program, or by about 25 percent of the annual ISOC credits (.20/.80). The Company proposes to retain 50 percent of this cost reduction as an incentive to market and administer the program effectively.

Q. WHY IS THE COMPANY PROPOSING TO BASE ITS ISOC FINANCIAL INCENTIVES ON A PERCENTAGE OF BENEFITS TO NONPARTICIPANTS, RATHER THAN ON SOME MEASURE OF NET ECONOMIC BENEFITS USING A TOTAL RESOURCE COST TEST?

A. There are several practical reasons. First, the concern over ISOC-related lost margins is minimal. In effect, the ISOC credits collected through the DSMCA are the lost margins.

Second, the application of a TRC test to C&I load-control programs is awkward. With energy-efficiency programs customers derive the same energy service with fewer energy inputs. They incur only their share of the cost of the efficiency investment. In contrast, customers on interruptible rates incur a cost when they are interrupted – either directly through the procurement, maintenance and running of backup generators or indirectly in terms of suffering the inconvenience and cost of process interruptions or delays. This participant cost is difficult to estimate and capture through a TRC test. All that we can safely conclude is that ISOC customers believe their direct and/or indirect costs of complying with the program are lower than the bill credits they receive.

Third, one of the Company's primary goals in offering the ISOC program is to ensure that rates to nonparticipants decrease. Adherence to this goal is particularly important when the program is available to only a small subset of its customer base (loads over 300 kW) and the environmental benefits in terms of reduced emissions are modest in comparison with

energy-efficiency programs. (Of course, interruptible programs such as the ISOC program provide environmental benefits to the extent they avoid the environmental impacts resulting from the construction of peaking units.) The Company's proposed financial incentive is a straightforward approach to ensuring that nonparticipants benefit from the program, because the sum of the ISOC credits and proposed financial incentive will not exceed the avoided internal cost.

Q. HOW DOES THE COMPANY PROPOSE TO RECOVER THIS INCENTIVE?

A. The Company proposes to recover its ISOC financial incentive with the same 18-month delay inherent in the recovery of the incentive for its energy-efficiency and Saver's Switch programs. For example, the Company would file for the recovery of its 2009 ISOC incentive on April 1, 2010, for recovery over the 12 months beginning July 1, 2010 and ending June 30, 2011.

IX. ANNUAL ISOC BENEFIT-COST ANALYSIS

Q. DOES THE COMPANY CURRENTLY PROVIDE ANNUAL REPORTS ON ITS ISOC PROGRAM?

A. Yes. The Company currently files an annual report on its ISOC program on April 1, the same date on which it requests recovery of its ISOC credits through the DSMCA. In this report the Company estimates the cost-effectiveness of the ISOC program for the previous year.

Q. DOES THE COMPANY PROPOSE TO CONTINUE TO FILE THESE REPORTS?

A. Yes, the Company proposes to continue filing reports on April 1, the same date on which it will seek recovery of its ISOC financial incentive. However, the Company believes that as long as the avoided costs, credits and Contract Interruptible Load are established properly in this proceeding, the ISOC program will always be cost-effective if administered in accordance with the tariff. The only cost-effectiveness issue to examine in the annual report will be the actual hours of interruption the Company called during the previous year and the resulting economic benefits in terms of reduced energy costs to nonparticipants. But, as I explained earlier, the program will be cost-effective even in the absence of any energy savings.

X. CONCLUSION

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

Attachment A

Statement Of Qualifications

Scott B. Brockett

I graduated from Otterbein College in 1980 with a Bachelor of Arts degree in English and Economics. I graduated from Miami University (Ohio) in 1981 with a Masters of Arts degree in Economics.

From August 1982 through February 1999 I was employed by the Minnesota Department of Public Service ("Department"), a state agency charged with developing energy policy and representing all customers in utility matters before the Minnesota Public Utilities Commission.

From August 1982 through My 1984 I was an analyst in the Computational Services Unit, where I conducted economic analyses and reviewed telecommunications depreciation filings. From June 1984 through January 1991 I worked in the Energy Unit. My major areas of responsibility were buyback rates for Qualifying Facilities, rate design, embedded cost of service and marginal cost of service.

From January 1991 to August 1994 I held two, similar supervisory positions. My primary responsibility was to oversee the Department Staff's advocacy in electric utility matters – including general rate proceedings, integrated resource plans, demand-side management programs, and a wide variety of other regulatory issues.

In August 1994 I was promoted to Manager of Energy Planning and Advocacy. In this capacity the responsibilities I assumed as a supervisor were expanded to include

natural gas advocacy, the development of state energy policy, and testifying on energy matters before the Minnesota Legislature.

In December 1998 I was appointed Acting Assistant Commissioner of Energy. I held this position until February 1999.

From February 1999 to July 2004 I was employed by Consumers Energy ("Consumers"), an investor-owned utility providing natural-gas and electric service in Michigan, as Supervisor of Pricing and Revenue Forecasting. My primary responsibilities were developing prices for Consumers' electric and natural gas services, conducting economic analyses of various service options, evaluating the impact of Michigan's electric open-access program, estimating customer bills, and forecasting natural gas and electric revenue. I also managed Consumers' voluntary Green Power Pilot Program.

During my tenure with the Department I testified on demand-side management, rate design, embedded cost of service, marginal cost of service, and the environmental costs of electric generation. During my tenure with Consumers I testified on gas pricing issues and electric stranded costs.

I assumed my current position with Xcel Energy in July 2004. I testified on pricing issues in two gas general rate case of Public Service Company of Colorado (Docket Nos. 05S-264G and 06S-656G).

ENERGY CREDIT AS % OF ISOC CUSTOMER'S TOTAL CREDIT AT PRIMARY VOLTAGE

ONE-HOUR NOTICE CUSTOMER

UNCONSTRAINED, NO MINIMUM HOURS

ANNUAL MAX. HOURS	ENERGY CREDIT PER kW	TOTAL CREDIT PER kW	ENERGY CREDIT AS % OF TOTAL CREDIT
40	$ 0.06	$ 4.87	1.2%
80	$ 0.12	$ 5.62	2.1%
160	$ 0.23	$ 6.17	3.7%

UNCONSTRAINED, MINIMUM OF 4 HOURS

ANNUAL MAX. HOURS	ENERGY CREDIT	TOTAL CREDIT	ENERGY CREDIT AS % OF TOTAL CREDIT
40	$ 0.06	$ 4.80	1.2%
80	$ 0.12	$ 5.62	2.1%
160	$ 0.23	$ 6.17	3.7%

MAXIMUM 4 HOURS IN 24-HOUR PERIOD
NO MINIMUM HOURS

ANNUAL MAX. HOURS	ENERGY CREDIT PER kW	TOTAL CREDIT PER kW	ENERGY CREDIT AS % OF TOTAL CREDIT
40	$ 0.06	$ 4.43	1.3%
80	$ 0.12	$ 4.93	2.4%
160	$ 0.23	$ 5.23	4.4%

MAXIMUM 4 HOURS IN 24-HOUR PERIOD
MINIMUM OF 4 HOURS

ANNUAL MAX. HOURS	ENERGY CREDIT	TOTAL CREDIT	ENERGY CREDIT AS % OF TOTAL CREDIT
40	$ 0.06	$ 4.37	1.3%
80	$ 0.12	$ 4.87	2.5%
160	$ 0.23	$ 5.17	4.5%

LESS THAN 10-MINUTE NOTICE CUSTOMER

UNCONSTRAINED, NO MINIMUM HOURS

ANNUAL MAX. HOURS	ENERGY CREDIT PER kW	TOTAL CREDIT PER kW	ENERGY CREDIT AS % OF TOTAL CREDIT
40	$ 0.06	$ 9.79	0.6%
80	$ 0.12	$ 11.25	1.1%
160	$ 0.23	$ 12.24	1.9%

UNCONSTRAINED, MINIMUM OF 4 HOURS

ANNUAL MAX. HOURS	ENERGY CREDIT	TOTAL CREDIT	ENERGY CREDIT AS % OF TOTAL CREDIT
40	$ 0.06	$ 9.66	0.6%
80	$ 0.12	$ 11.25	1.1%
160	$ 0.23	$ 12.24	1.9%

MAXIMUM 4 HOURS IN 24-HOUR PERIOD
NO MINIMUM HOURS

ANNUAL MAX. HOURS	ENERGY CREDIT PER kW	TOTAL CREDIT PER kW	ENERGY CREDIT AS % OF TOTAL CREDIT
40	$ 0.06	$ 8.91	0.6%
80	$ 0.12	$ 9.85	1.2%
160	$ 0.23	$ 10.34	2.2%

MAXIMUM 4 HOURS IN 24-HOUR PERIOD
MINIMUM OF 4 HOURS

ANNUAL MAX. HOURS	ENERGY CREDIT	TOTAL CREDIT	ENERGY CREDIT AS % OF TOTAL CREDIT
40	$ 0.06	$ 8.78	0.6%
80	$ 0.12	$ 9.73	1.2%
160	$ 0.23	$ 10.22	2.3%

MATRIX OF ISOC CREDITS (AVERAGE $ PER kW PER MONTH)
NO MINIMUM HOURS PER INTERRUPTION

INPUTS:

1-Hour Foundation Value ($/kW/Mo.)	$	7.63
< 10-Minute Foundation Value ($/kW/Mo.	$	15.44
Losses from Trans. To Pri.		2.35%
Credit Adjustment Factor		80%

ENERGY SAVINGS:

40 Hours	$	0.06
80 Hours	$	0.12
160 Hours	$	0.23

ONE-HOUR NOTICE PRIMARY CUSTOMER PROPOSED

MAXIMUM ANNUAL HOURS	UNCONSTRAINED	MAXIMUM 4 HOURS IN 24-HOUR ROLLING
40	$ 4.87	$ 4.43
80	$ 5.62	$ 4.93
160	$ 6.17	$ 5.23

ONE-HOUR NOTICE PRIMARY CUSTOMER CURRENT

MAXIMUM ANNUAL HOURS	UNCONSTRAINED	PROPOSED MINUS CURRENT
40	$ 2.04	$ 2.83
80	$ 2.85	$ 2.77
160	$ 3.45	$ 2.72

10-MINUTE NOTICE PRIMARY CUSTOMER PROPOSED

MAXIMUM ANNUAL HOURS	UNCONSTRAINED	MAXIMUM 4 HOURS IN 24-HOUR ROLLING
40	$ 9.79	$ 8.91
80	$ 11.25	$ 9.85
160	$ 12.24	$ 10.34

10-MINUTE NOTICE PRIMARY CUSTOMER CURRENT

MAXIMUM ANNUAL HOURS	UNCONSTRAINED	PROPOSED MINUS CURRENT
40	$ 5.16	$ 4.63
80	$ 6.85	$ 4.40
160	$ 7.63	$ 4.61

MATRIX OF ISOC CREDITS (AVERAGE $ PER kW PER MONTH)
MINIMUM OF 4 HOURS PER INTERRUPTION

INPUTS:

1-Hour Foundation Value ($/kW/Mo.)	$	7.63
< 10-Minute Foundation Value ($/kW/Mo.	$	15.44
Losses from Trans. To Prl.		2.35%
Credit Adjustment Factor		80%

ENERGY SAVINGS:

40 Hours	$	0.06
80 Hours	$	0.12
160 Hours	$	0.23

ONE-HOUR NOTICE PRIMARY CUSTOMER PROPOSED

MAXIMUM ANNUAL HOURS	UNCONSTRAINED	MAXIMUM 4 HOURS IN 24-HOUR ROLLING
40	$ 4.80	$ 4.37
80	$ 5.62	$ 4.87
160	$ 6.17	$ 5.17

ONE-HOUR NOTICE PRIMARY CUSTOMER CURRENT

MAXIMUM ANNUAL HOURS	UNCONSTRAINED	PROPOSED MINUS CURRENT
40	$ 2.04	$ 2.76
80	$ 2.85	$ 2.77
160	$ 3.45	$ 2.72

10-MINUTE NOTICE PRIMARY CUSTOMER PROPOSED

MAXIMUM ANNUAL HOURS	UNCONSTRAINED	MAXIMUM 4 HOURS IN 24-HOUR ROLLING
40	$ 9.66	$ 8.78
80	$ 11.25	$ 9.73
160	$ 12.24	$ 10.22

10-MINUTE NOTICE PRIMARY CUSTOMER CURRENT

MAXIMUM ANNUAL HOURS	UNCONSTRAINED	PROPOSED MINUS CURRENT
40	$ 5.16	$ 4.50
80	$ 6.85	$ 4.40
160	$ 7.63	$ 4.61

RE: THE TARIFF SHEETS FILED BY PUBLIC SERVICE COMPANY OF COLORADO WITH ADVICE LETTER NO. 1495 – ELECTRIC.

DOCKET NO. _____

DIRECT TESTIMONY AND EXHIBITS

OF

ALAN S. TAYLOR

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF COLORADO
* * * * *

RE: THE TARIFF SHEETS FILED BY PUBLIC SERVICE COMPANY OF COLORADO WITH ADVICE LETTER NO. 1495 – ELECTRIC.	))))	DOCKET NO. _____

DIRECT TESTIMONY AND EXHIBITS OF

ALAN S. TAYLOR

I. INTRODUCTION AND PURPOSE

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Alan S. Taylor. My business address is 5511 Northfork Court, Boulder, CO 80301.

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

A. I am employed by Sedway Consulting, Inc. I am the president and founder of the firm.

Q. ON WHOSE BEHALF ARE YOU SUBMITTING THIS TESTIMONY?

A. I am submitting this Direct Testimony on behalf of Public Service Company of Colorado ("PSCo").

Q. HAVE YOU PREPARED A STATEMENT OF YOUR EXPERIENCE AND QUALIFICATIONS?

A. Yes. That statement is included with my testimony as Attachment A.

Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?

A. The purpose of my testimony is to estimate the costs that PSCo can be expected to avoid by offering its Interruptible Service Option Credit ("ISOC")

program to large customers. Specifically, I will discuss the independent analysis that Sedway Consulting undertook to estimate the avoided costs attributable to each of the proposed ISOC service options. PSCo witness Timothy J. Sheesley will identify and explain these service options in more detail.

Q. ARE YOU SPONSORING PSCO'S PROPOSED ISOC CREDITS?

A. No. Mr. Sheesley and PSCo witness Scott Brockett will sponsor the proposed ISOC credits, based on the avoided costs that I derive.

II. METHODOLOGY AND ESTIMATES OF AVOIDED COSTS

Q. DID YOU REVIEW THE METHOD PSCO CURRENTLY USES TO ESTIMATE THE AVOIDED COSTS ATTRIBUTABLE TO ITS ISOC PROGRAM?

A. Yes, and Sedway Consulting found most of PSCo's approach to be sound and appropriate. Indeed, the approach Sedway Consulting proposes in this proceeding is largely consistent with the methodology that PSCo employed and the Colorado Public Utilities Commission accepted in Docket No. 04A-164E.

Q. IN WHAT WAYS IS YOUR METHODOLOGY CONSISTENT WITH PSCO'S PREVIOUS APPROACH?

A. First, I agree with the premise that an interruptible customer provides a utility with a service that is analogous (at least to some degree) to that provided by peaking generating resources. Thus, if a utility forecasts that it may fall short of its reliability requirements (e.g., its reserve margin targets) in the future, it could choose to acquire or develop a peaking resource such as a combustion turbine ("CT") or implement an interruptible customer program. While these actions do not yield perfectly equivalent results, they have similar effects. Thus, the cost of

developing a CT (with appropriate adjustments) can be used to determine the value of interruptible load and the credit that can be offered to interruptible customers.

Second, I use many of the same calculation procedures and components as PSCo did in its previous filing. When appropriate, I update specific elements and cost estimates with more current information.

Q. PLEASE DESCRIBE THIS METHODOLOGY AND NOTE WHERE YOU INCLUDED UPDATED INFORMATION OR DIFFERENT PROCEDURES.

A. As PSCo did previously, I determined that a Frame CT (such as GE's Frame 7FA technology) represents a reasonably equivalent generating technology for assessing the value of interruptible load that requires one hour's advance notice for curtailment. This technology is commonly used for peaking service, but does not have the rapid start-up capabilities of other, more expensive peaking technologies that provide faster (i.e., less than 10-minute) start-up responsiveness. Those faster technologies are relevant to the calculation of the premium that should apply to those interruptible customers who can interrupt load in 10 minutes or less and will be discussed later in my testimony.

Q. WHAT COST DID YOU ASSUME FOR A FRAME CT?

A. As PSCo did previously, I relied on the Department of Energy's Energy Information Agency ("EIA") estimates for the costs and operating parameters of this type of CT. I used the latest information from EIA's Electricity Market Module Report (released in April 2007, and publicly available on EIA's website). That report references a conventional 160 MW CT (i.e., a Frame machine) as

having an overnight installed cost of $420/kW (2005$), a heat rate of 10,450 Btu/kWh, and a variable operating and maintenance (O&M) cost of $3.36/MWh (2005$). I escalated the cost information to 2007 values based on PSCo's general inflation/escalation assumption of 2.37% per year. Thus, the EIA $/kW installed cost estimate was increased to slightly more than $440/kW (2007$) – essentially the same $/kW estimate that PSCo used in its previous filing.

Q. WAS THAT THE $/KW VALUE THAT YOU USED IN THE ISOC AVOIDED COST ANALYSIS?

A. No. That $/kW value was based on a Frame CT's capacity at International Standard Operating (ISO) ambient conditions (e.g., 59°F, sea-level altitude); in addition, the value did not include transmission interconnection costs. Higher ambient temperatures and altitude reduce the output of a CT. In PSCo's planning process, the utility estimates that a Frame 7FA CT will provide 128.9 MW at a summer temperature of 90°F and at Colorado's mile-high altitude. Because those conditions are applicable or likely to be prevailing when PSCo interrupts its ISOC customers, I believe that the summer rating of the CT should be used in calculating the $/kW installed cost estimate for use in the ISOC avoided cost analysis. Also, a CT is not of any benefit to a utility's customers unless it is connected to the utility's transmission system. In PSCo's planning processes, the utility has estimated that the transmission interconnection costs for a Frame CT are $4.5 million (2007$). Therefore, as depicted in Exhibit No. AST-1, I used EIA's estimate of the total construction cost of a conventional CT ($67.2 million = 160 MW x $420/kW, in 2005 dollars), escalated that value to

2007 dollars, added $4.5 million of transmission interconnection costs, and divided the $74.923 million result by 128.9 MW to yield $581.25/kW.

Q. HOW WAS THIS INSTALLED COST USED IN SEDWAY CONSULTING'S ISOC AVOIDED COST ANALYSIS?

A. As PSCo did previously, I multiplied this $/kW cost estimate by a fixed charge rate to yield a levelized annual revenue requirement. This value approximates the annual levelized cost to the utility's customers if PSCo were to construct a Frame CT and ratebase its investment.

Q. DID YOU USE THE SAME FIXED CHARGE RATE AS PSCO DID IN ITS LAST FILING?

A. No. PSCo used a 14.11% fixed charge rate in its previous filing. I used an updated value of 14.89% that I developed from Sedway Consulting's revenue requirement model and updated information concerning PSCo's capital structure, financial rates, tax rates, and other fixed costs.

Q. IS THE PRODUCT OF THE $581.25/KW INSTALLED COST AND THE 14.89% FIXED CHARGE RATE AN ESTIMATE OF THE ANNUAL COST OF A CT?

A. Basically, this product (which equals $86.55/kW-year or $7.21/kW-month) represents the total annual fixed costs of a CT. It is a slight overestimate in that it does not account for the value that a new CT would provide to PSCo's system in terms of reduced fuel and O&M expenses in those hours that PSCo could dispatch the CT and avoid using more expensive generating resources or making more expensive purchases. The total fixed costs must be reduced by

the CT's energy benefits to yield a value that reflects the net cost that would be borne by the utility's ratepayers. Thus, I requested that PSCo use its PROSYM hourly system simulation model to generate hourly marginal costs that I could use to evaluate the energy-related benefits of a new Frame CT. I examined five years of hourly marginal costs (2007-2011) and determined that a new Frame CT would provide energy benefits that would offset approximately $0.30/kW-month of the CT's fixed costs. Thus, the net costs of the CT were found to be approximately $6.91/kW-month.

Q. SO IS THIS AMOUNT THE ESTIMATED AVOIDED COST?

A. No, I took three more steps to convert this value into an avoided cost.

First, as was done in PSCo's previous analysis, I recognized that an interruptible customer does not provide reactive power or automatic generation control (AGC) capabilities – services that could be available from a peaking generation resource. Each of these services has been valued at $0.25/kW-month in recent power purchase agreements that PSCo has signed with power suppliers. Thus, I deducted $0.25/kW-month for each of these services (a combined total of $0.50/kW-month) from the net cost of the CT, yielding a value of $6.41/kW-month. This same adjustment is reflected in PSCo's current ISOC credits.

Second, as was done in PSCo's previous analysis, I recognized that interruptible loads avoid system-level transmission losses. In PSCo's previous analysis, the transmission loss factor was 3.51%; Sedway Consulting's analysis used an updated value of 2.56%. In essence, using the new value of 2.56%,

100 MW of interruptible load would be equivalent to 102.56 MW of additional supply-side resources; that is the amount of additional generating capacity that would be needed to supply 100 MW of load after transmitting the power across the transmission system and incurring transmission losses of 2.56%. Thus, on a per-MW basis, interruptible load has a higher value than a generating resource. The $6.41/kW-month value was therefore multiplied by 1.0256 to yield a value of approximately $6.58/kW-month.

Third, in comparing the respective values of interruptible loads and supply-side generation, it is important to recognize the impact of each class of resource on PSCo's target reserve margin. PSCo seeks to maintain a 16% reserve margin. Thus, to cover 100 MW of load, the utility needs to develop or acquire 116 MW of firm capacity. If that load is interruptible, the utility can avoid developing or acquiring 116 MW of generation facilities. Thus, 100 MW of interruptible load is equivalent to 116 MW of supply-side capacity. As was the case with the transmission losses described above, interruptible load has a correspondingly higher value than a generating resource on a per-MW basis.

The $6.58/kW-month value was therefore multiplied by 1.16 to yield a value of approximately $7.63/kW-month.

All of these steps are depicted in Exhibit No. AST-1.

Q. ARE ALL OF THE ABOVE STEPS THE SAME ONES EMPLOYED BY PSCO IN ITS PREVIOUS ANALYSIS?

A. PSCo employed all of these adjustments except for the summer capacity adjustment, the netting of the CT's energy value, and the reserve margin

adjustment. It is my impression that PSCo's previous analysis may have internalized some of those issues in the interruptible load percentage multipliers that the utility developed from its loss-of-load-probability statistics and call-option modeling. Instead, I chose to value them explicitly and include them as specific adjustments to the cost of a CT in calculating the avoided cost.

Q. SO DO YOU CONCLUDE THAT THE AVOIDED COST OF ALL ISOC LOAD IS $7.63/KW-MONTH?

A. No. This is what I refer to as the "foundation value." It represents the equivalent value of an interruptible customer's load, assuming that there were no constraints on how often PSCo could interrupt the customer (i.e., assuming that PSCo could "dispatch" the interruptible customer just as often as it might dispatch a Frame CT). The actual avoided cost depends on the constraints and limitations that PSCo must honor in interrupting the customer. For example, PSCo's proposed interruptible tariff has three categories of annual limitations on the number of hours that PSCo can interrupt – 40 hours, 80 hours, and 160 hours. In my simulation analysis that was based on PSCo's 2007-2011 system assumptions, a Frame CT was projected to run over 400 hours/year on average. Thus, none of the categories of interruptible customers would give PSCo the full flexibility and number of dispatch hours that it would be likely to have or use with a Frame CT. Therefore, as was done by PSCo in its previous analysis, I calculated a percentage multiplier that recognizes the reduced value (relative to a Frame CT) of the annual limitations for each category of ISOC load.

Q. WHAT DID YOU DETERMINE THOSE PERCENTAGE MULTIPLIERS TO BE?

A. My analysis indicates that a customer in the 160-hour category would provide value rather close to the value of a CT. The percentage multiplier for this category was determined to be 95%, reflecting the fact that having 160 hours/year of interruptions would provide PSCo with a resource that was virtually equivalent to a CT. Being able to reduce its loads in the highest 160 hours of the year would allow PSCo to capture the overwhelming majority of the equivalent reliability and economic value of a CT. While it is true that there would be a couple hundred additional "shoulder" hours that PSCo might operate the CT, the value of those hours was found to be fairly small in my analysis.

The 80-hour and 40-hour categories had percentage multipliers of 88% and 77%, respectively, reflecting progressively less value relative to the CT as the annual hourly limitations become more constraining. However, even considering just the highest 40 hours in which PSCo could reduce its load, the reliability and economic benefits were found to be quite substantial.

Q. HOW DID YOU DEVELOP THESE PERCENTAGE MULTIPLIERS?

A. First, I developed a $/MWh estimate of the economic and reliability value of each of the 8,760 hours of a typical year, relative to how PSCo was likely to operate a Frame CT on its system and the net costs that PSCo would incur in developing and operating that CT. In a sense, I developed an hourly margin forecast for a typical year during which, if PSCo sold the output from a Frame CT into a market with those hourly margins, the utility would be made whole for

the annual revenue requirements associated with developing, owning, and operating the CT. The percentage multipliers for the different interruptible customer categories were then effectively developed by taking the sum total of the hourly values for the top 40, 80, or 160 hours relative to the complete 8,760 hourly total (which represents the total annual CT revenue requirements).

Q. HOW DID YOU ESTIMATE THE $/MWH ECONOMIC AND RELIABILITY VALUE FOR EACH HOUR?

A. First, I reviewed the hourly energy margins that a Frame CT was likely to achieve during the five-year period (2007-2011) that PSCo had modeled in PROSYM for its most recently filed Least Cost Plan (LCP). I requested that PSCo remove the interruptible load program from that base case (i.e., eliminate the curtailment options and effectively add that load back in) and add in an appropriately sized Frame CT as a replacement resource for the eliminated interruptible loads. By "appropriately sized" I mean a CT that could replace the interruptible loads with sufficient MWs to maintain PSCo's desired 16% reserve margin target (and account for system-level transmission losses), such that PSCo would continue to achieve its desired reserve margin.

The PROSYM results that I used from this simulation were the hourly marginal costs. I calculated the hourly energy margins for the Frame CT by subtracting the CT's $/MWh variable costs (fuel and variable O&M) from each hour's marginal costs for those hours when the CT would be dispatched for economic reasons (i.e., when an hour's marginal cost was greater than the CT's variable cost). For each calendar hour, I averaged the five years' worth of

hourly energy margins, after shifting each year's calendar information to make sure that the load shapes lined up appropriately (i.e., that the peak hour occurred at the same date and time for each annual strip of energy margins).

Q. WHY DID YOU AVERAGE FIVE YEARS OF INFORMATION?

A. I did not want to rely on only one year's worth of PROSYM simulation results. I felt that using the varying fuel prices and combinations of generator outages in PROSYM over the time horizon of the next five years would yield a more representative estimate of likely hourly energy margins for the Frame CT than merely running a one-year simulation.

Q. SO THIS ANALYSIS YIELDED A FORECASTED STRIP OF 8,760 HOURS OF EXPECTED ENERGY MARGINS FOR THE FRAME CT. WHAT DID YOU DO NEXT?

A. This strip of energy margins (which, understandably, are $0/MWh for most hours) represents the economic benefits (in reduced fuel and purchase power expenses) that PSCo would capture if it could dispatch the CT rather than having to rely on more expensive generation or power purchases.

As described earlier, the annual total of these hourly energy margins was subtracted from the total annual levelized revenue requirements of the CT to yield a net or residual revenue requirement. This residual revenue requirement represents that portion of the CT's total revenue requirements that could not be justified purely on the basis of economic dispatch. Instead, this residual revenue requirement represents the costs associated with the reliability

benefits of the CT (i.e., maintaining adequate reserve margins and "keeping the lights on").

I requested that PSCo run PROSYM's reliability module for the same adjusted base case for the same 2007-2011 period and generate hourly loss-of-load-probabilities ("LOLP"). I averaged the hourly LOLP values, after shifting each year's calendar information to make sure that the load shapes lined up appropriately in the same way as was done with the energy margin averaging. I then distributed the annual residual revenue requirement to each hour in proportion to that hour's percentage of the total annual LOLP value. Thus, an hour with twice the LOLP as another hour had twice the reliability dollars assigned to it. Hours with zero LOLP (which was most of the hours) had no dollars assigned to them.

Finally, for each hour, I summed the energy margin value and the LOLP-based residual revenue requirement to yield a total $/MWh estimate of the economic and reliability value of that hour. In effect, this pattern of values represents the total energy and capacity-related margins that PSCo would need to recover in each hour that a Frame CT was likely to operate in order to exactly cover its investment and associated revenue requirements for the CT.

Q. WHAT DID YOU DO NEXT WITH THIS 8,760 HOUR STRIP OF $/MWH VALUES?

A. PSCo requested that Sedway Consulting determine how the avoided cost would change if additional constraints were imposed on PSCo's ability to call for interruptions.

PSCo's current program sets annual limitations on the number of hours a customer can be interrupted (and requires that interruptions be for no less than four hours in duration). However, there is no maximum limit on the daily number of hours a customer can be interrupted. As explained in Mr. Brockett's testimony, PSCo has concluded that there may be customers who would be more apt to participate in the program if the utility added new service options that would limit daily interruptions to no more than four hours within any rolling 24-hour period and/or allow interruptions of less than four hours. Thus, it became important for Sedway Consulting to consider the chronology of potential interruptions in its examination of the value of various categories and subcategories of interruptible customers. To explore the consequences of the actual chronology of potential interruptions, I took the hourly estimates of economic and reliability value that I had developed and distributed them according to PSCo's actual loads in a set of annual analyses for each of the last five years (2002-2006).

Q. WHY DID YOU DISTRIBUTE THE HOURLY ESTIMATES INTO PATTERNS BASED ON HISTORICAL LOADS, RATHER THAN SIMPLY USING THE PATTERN THAT CAME OUT OF PROSYM?

A. PSCo's PROSYM model is populated with generic load shapes that are entirely appropriate for prospective analyses of generation dispatch and resource acquisition decisions. However, those generic load shapes may have been averaged and/or parsed out and selected from various years and compiled into "typical" patterns of loads. These patterns may have been smoothed to be

broadly representative of average monthly conditions. However, I needed to recognize the diversity inherent in real-world load patterns. Given the importance of analyzing the specific chronology of high-load periods (i.e., the actual timing and duration of high-load hours each day), I believe that it is essential to use actual historical load patterns to gauge the value of customer interruptions that might be limited or constrained on a daily basis. Thus, while I used a five-year prospective period (2007-2011) to estimate the likely costs of a CT that might be avoided by PSCo's interruptible customer program, I used a five-year historical period (2002-2006) to examine the potential impacts that the actual chronology of load variations may have on the value of those interruptible customers.

Q. HOW DID YOU DISTRIBUTE THE HOURLY ESTIMATES INTO PATTERNS BASED ON HISTORICAL LOADS?

A. I performed this process one year at a time, distributing the 8,760 hourly $/MWh values from the prospective cost-of-a-CT analysis across the hours of an actual year based on that year's loads. Thus, the highest $/MWh value was assigned to the peak hour in the historical year; the second highest $/MWh value was assigned to the hour with the second highest load, as so forth. Based on that specific year's pattern of loads (and the resulting pattern of $/MWh values), I calculated the cumulative values of the top 40, 80, and 160 hours, divided those cumulative values for each category by the total value for the year, and thereby derived a percentage multiplier for each category that effectively represents the percentage equivalence of interruptible customers in that category relative to a

Frame CT. I performed this exercise for each of the five historical years and calculated the average of the five percentages within each category to yield final percentages for the avoided cost calculations.

Q. WHAT WERE THE RESULTS OF YOUR ANALYSIS?

A. As noted earlier in my testimony, I conclude that the percentages for annual interruption limitations of 40, 80 and 160 hours should be 77%, 88%, and 95%, respectively. Beyond the annual limits of interruption hours, there are no other constraints in this scenario. Thus, I refer to this as the "unconstrained" scenario. I then repeated this analysis, one year at a time, for three additional scenarios: 1) an "unconstrained"/four-hour minimum scenario which was identical to the unconstrained scenario except that whenever an interruption occurred, it had to be at least four hours in duration; 2) a scenario in which interruptions could be no more than four contiguous hours within any 24-hour period; and 3) a scenario that combined the previous two constraints (i.e., no more than four contiguous hours within any 24-hour period, but with a four-hour minimum requirement for any interruption). For each category (e.g., 40-, 80- and 160-limits), these constraints required trimming various hours from the schedules developed in the unconstrained scenario and shifting those interruption hours into other days and hours that were less valuable (but which honored the relevant constraints).

I calculated the equivalent percentage multipliers in the same fashion as with the unconstrained scenario and concluded that those percentages for the 40-, 80-, and 160-hour customers should be the following:

	Annual hourly limit		
	40-hour	80-hour	160-hour
Unconstrained with four-hour minimum	76%	88%	95%
Four-hour limitation per 24 hours with no four-hour minimum	70%	77%	80%
Four-hour limitation per 24 hours with four-hour minimum	69%	76%	79%

The supporting information behind these percentage multipliers is shown in Exhibit No. AST-2. These are the percentages by which the foundation value of $7.63/kW-month described earlier should be multiplied in order to calculate the avoided cost for the applicable category of interruptible customers that require one-hour notice. For those customers who can interrupt with only 10 minutes' notice, the above arithmetic would be supplemented with an additional percentage multiplier of 202%.

Q. DESCRIBE HOW YOU CALCULATED THIS MULTIPLIER OF 202% FOR 10-MINUTE NOTICE LOADS.

A. It was calculated essentially in the same manner as was used to develop the avoided cost underlying PSCo's current credit for less than 10-minute loads. This multiplier represents the ratio of the levelized, interruptible-load-equivalent, net revenue requirements of a quick-start CT (i.e., one that can start up and attain full load in 10 minutes or less) to the revenue requirements of a Frame CT. Although PSCo's current credit was based on General Electric's LM6000 CT technology, PSCo's current planning assumptions identify General Electric's

new CT technology (the LMS100) as a preferable quick-start peaking resource. Thus, I used PSCo's latest estimates for the cost of this technology ($86.5 million in 2007 dollars, inclusive of the cost of transmission interconnection, for a CT with a summer capacity of 77 MW) in deriving the ISOC multiplier for 10-minute notice customers. Specifically, I determined that an LMS100 CT had an adjusted equivalent revenue requirement of $15.44/kW-month. This number was derived in an identical fashion to the methodology used to calculate the interruptible-load-equivalent revenue requirement for a Frame CT. The details of this derivation are provided in Exhibit No. AST-3. As discussed earlier in my testimony, I found that the equivalent value for a Frame CT was $7.63/kW-month. Thus, the ratio of these two numbers yields a multiplier of 202%.

Q. DO THE ABOVE MULTIPLIERS YIELD THE FINAL AVOIDED COSTS ATTRIBUTABLE TO THE PROPOSED ISOC SERVICE OPTIONS?

A. There are two additional adjustments. As described in Mr. Sheesley's testimony, PSCo is applying multipliers to reflect the reduced losses at various subtransmission voltage levels. Also, Mr. Sheesley sponsors and explains adders to the avoided costs I derive that recognize the system fuel savings afforded through the dispatch of interruptible load. These savings reflect the difference between the Electric Commodity Adjustment ("ECA") paid by ISOC customers and the variable cost of the Frame CT that was the basis of my analysis. Both adjustments are appropriate adders to the avoided costs that I derive.

III. SUMMARY AND CONCLUSIONS

Q. WHAT DID SEDWAY CONSULTING'S ANALYSIS CONCLUDE?

A. Sedway Consulting's independent analysis concluded that the basic avoided costs associated with any particular PSCo ISOC service category can be calculated as the product of two or three values. Those values are provided in Exhibit No. AST-4 and include the foundational value of $7.36/kW-month, a percentage value in the range of 69% to 95% (depending on the ISOC service category), and, in the case of those customers willing to respond to interruption requests with only 10 minutes' notice, an additional multiplier of 202%.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes it does.

Attachment A

Statement of Qualifications

Alan S. Taylor

I am President of Sedway Consulting, Inc. and have extensive experience in utility planning and rate analysis. Formerly a senior member of PA Consulting and a vice president of PHB Hagler Bailly, I have analyzed competitive bidding power supply arrangements, interruptible and demand-side management programs, utility restructuring proposals, mergers, and asset transfer transactions in California, Colorado, Florida, Georgia, Kentucky, Illinois, Iowa, Louisiana, Maine, Minnesota, Missouri, New Mexico, New York, North Carolina, South Dakota, Utah, Wisconsin, and Texas. In my 22 years of utility consulting, I have evaluated hundreds of power supply proposals and numerous interruptible load programs and have testified before many state commissions and the Federal Energy Regulatory Commission (FERC) on power supply and rate-related analyses.

I earned a Bachelor of Science Degree in energy engineering from the Massachusetts Institute of Technology in 1983 and a Masters Degree in Business Administration from the Haas School of Business at the University of California, Berkeley in 1991, where I specialized in finance and graduated valedictorian.

I began my career at Baltimore Gas & Electric Company, where I performed efficiency and environmental compliance testing on the utility system's power plants. I subsequently worked for five years as a senior consultant at

Energy Management Associates (EMA, now New Energy Associates), training and assisting over two dozen utilities in their use of EMA's operational and strategic planning models, PROMOD III and PROSCREEN II. During my graduate studies, I was employed by Pacific Gas & Electric Company (PG&E), where I analyzed the utility's proposed demand-side management (DSM) incentive ratemaking mechanism, and by Lawrence Berkeley Laboratory (LBL), where I evaluated utility regulatory policies surrounding the development of brownfield generation sites.

Subsequently, I worked at PHB Hagler Bailly (and its predecessor firms) for ten years, serving as a vice president in the firm's Global Economic Business Services practice and as a senior member of the Wholesale Energy Markets practice of PA Consulting Group, when that firm acquired PHB Hagler Bailly in 2000. In 2001, I founded Sedway Consulting, Inc. and have continued to specialize in economic analyses associated with electricity wholesale markets and utility rate proceedings.

Exhibit No. AST-1
Calculation of Base Avoided Cost ("Foundation Value")

1	EIA estimate of Frame 7 CT overnight construction costs ($M, '05$)	67.200
2	Escalated to 2007$ ($M, '07$)	70.423
3	Transmission interconnection costs ($M, '07$)	4.500
4	Total construction costs ($M, '07$)	74.923
5	Normalized cost, based on 128.9 MW summer capacity ($/kW)	581.25
6	Fixed charge rate	14.89%
7	Annual levelized cost ($/kW-yr)	86.55
8	Monthly levellzed cost ($/kW-mo)	7.21
9	Energy benefits of Frame 7 CT ($/kW-mo)	0.30
10	Initial net costs of Frame 7 CT ($/kW-mo)	6.91
11	Adjustment for reactive power capability ($/kW-mo)	0.25
12	Adjustment for AGC capability ($/kW-mo)	0.25
13	Net costs minus above adjustments ($/kW-mo)	6.41
14	Transmission loss factor	2.56%
15	Net costs, adjusted for losses ($/kW-mo)	6.58
16	Target reserve margin	16.00%
17	Net costs, adjusted for reserve margin impact ($/kW-mo)	7.63

Exhibit No. AST-2
Derivation of Percentage Multipliers for Different ISOC Customer Classes

	Unconstrained no 4 hr min		
	40-hr	80-hr	160-hr
2002	77%	88%	95%
2003	77%	88%	95%
2004	77%	88%	95%
2005	77%	88%	95%
2006	77%	88%	95%
Average	**77%**	**88%**	**95%**

	"Unconstrained"/4 hr min		
	40-hr	80-hr	160-hr
2002	76%	88%	95%
2003	76%	88%	95%
2004	76%	88%	95%
2005	77%	88%	95%
2006	75%	88%	95%
Average	**76%**	**88%**	**95%**

	4 hr limitation per 24 hrs/no 4 hr min		
	40-hr	80-hr	160-hr
2002	70%	77%	80%
2003	72%	80%	83%
2004	62%	67%	70%
2005	69%	75%	77%
2006	77%	86%	89%
Average	**70%**	**77%**	**80%**

	4 hr limitation per 24 hrs with 4 hr min		
	40-hr	80-hr	160-hr
2002	69%	77%	80%
2003	71%	79%	82%
2004	61%	66%	69%
2005	68%	74%	77%
2006	74%	83%	87%
Average	**69%**	**76%**	**79%**

Exhibit No. AST-3
Calculation of 10-Minute Notice Multiplier

1	Multiplier =	Foundation value of LMS100 CT	=	15.44	=	202%
2		Foundation value of GE Frame 7 CT		7.63		

3	Xcel Energy estimate of LMS100 CT overnight construction costs ($M, '07$)	82.000
4	Transmission interconnection costs ($M, '07$)	4.500
5	Total construction costs ($M, '07$)	86.500
6	Normalized cost, based on 77 MW summer capacity ($/kW)	1123.38
7	Fixed charge rate	14.89%
8	Annual levelized cost ($/kW-yr)	167.27
9	Monthly levelized cost ($/kW-mo)	13.94
10	Energy benefits of LMS100 CT ($/kW-mo)	0.46
11	Initial net costs of LMS100 CT ($/kW-mo)	13.47
12	Adjustment for reactive power capability ($/kW-mo)	0.25
13	Adjustment for AGC capability ($/kW-mo)	0.25
14	Net costs minus above adjustments ($/kW-mo)	12.97
15	Transmission loss factor	2.56%
16	Net costs, adjusted for losses ($/kW-mo)	13.31
17	Target reserve margin	16.00%
18	Net costs, adjusted for reserve margin impact ($/kW-mo)	15.44

Exhibit No. AST-4
Matrix of Avoided Costs for All Service Options

1	**Base 1-hour foundation value:**	$7.63 /kW-mo

2		40-hr	80-hr	160-hr
3	**Unconstrained**	77%	88%	95%
4	**"Unconstrained"/4 hr min**	76%	88%	95%
5	**4 hr limitation per 24 hrs/no 4 hr min**	70%	77%	80%
6	**4 hr limitation per 24 hr with 4 hr min**	69%	76%	79%

7	**Multiplier for 10-minute notice:**	202%

RE: THE TARIFF SHEETS FILED BY PUBLIC SERVICE COMPANY OF COLORADO WITH ADVICE LETTER NO. 1495 – ELECTRIC.

DOCKET NO. _____

DIRECT TESTIMONY AND EXHIBITS

OF

TIMOTHY J. SHEESLEY

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF COLORADO
* * * * *

RE: THE TARIFF SHEETS FILED BY PUBLIC SERVICE COMPANY OF COLORADO WITH ADVICE LETTER NO. 1495 – ELECTRIC	))))	DOCKET NO. _____

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INDEX

SECTION PAGE

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DIRECT TESTIMONY AND EXHIBITS OF

TIMOTHY J. SHEESLEY

I. INTRODUCTION AND QUALIFICATIONS

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Timothy J. Sheesley. My business address is 1225 17th Street, Suite 1000, Denver, Colorado, 80202.

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

A. I am employed by Xcel Energy Services, Inc., the service company subsidiary of Xcel Energy Inc. ("Xcel Energy"), the registered public utility holding company parent of Public Service Company of Colorado. My title is Chief Economist.

Q. WHOM ARE YOU REPRESENTING IN THIS PROCEEDING?

A. I am testifying on behalf of Public Service Company of Colorado ("Public Service" or "Company").

Q. HAVE YOU PREPARED A STATEMENT OF YOUR EXPERIENCE AND QUALIFICATIONS?

A. Yes. That statement is included with my testimony as Attachment A.

II. PURPOSE OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?

A. My testimony explains the tariff changes and calculations supporting the revisions the Company proposes to the credits, service options and conditions of service in its Interruptible Service Option Credit (ISOC) tariff. The proposed credits and the basis for several of the new service options are provided in the testimony of Company witnesses Alan Taylor and Scott Brockett.

Q. WHAT IS THE PURPOSE OF THE REVISIONS TO THE ISOC TARIFF?

A. The proposed revisions accomplish three objectives. First, they provide more flexible participation options, potentially allowing more customers to join the program. Second, they clarify processes that the Company has put in place over the last few years to administer the ISOC program. Third, they eliminate out-of-date language and clean up unnecessary or unclear language.

Q. HAVE YOU PREPARED A REVISED ISOC TARIFF?

A. Yes. Exhibit No. TJS-1 is a redlined copy of the current ISOC tariff with proposed changes. Exhibit No. TJS-2 is the revised ISOC tariff.

III. NEW TARIFF PROVISIONS

A. CONTROL THROUGH ENERGY MANAGEMENT SYSTEMS

Q. WHAT ARE THE NEW TARIFF PROVISIONS GOVERNING CONTROL THROUGH ENERGY MANAGEMENT SYSTEMS?

A. The current ISOC tariff allows self-interruption for 1-hour notice customers but requires less than 10-minute notice customers to provide the Company with physical control of their load through the installation of Company switches. Company switches cost $20,000 to $60,000 per site, a cost to the customer that limits program growth. At the same time, with advances in technology, many customers with large electric loads now have Energy Management Systems ("EMS") that can receive signals and interrupt customer-owned equipment. EMS is defined broadly to be any automatic customer-owned means of interruption. The revised ISOC tariff allows the Company to use the customer's EMS to interrupt load.

Q. HOW WOULD THE COMPANY INTERRUPT A CUSTOMER USING AN EMS?

A. Less than 10-minute notice customers would have the option of effecting their required load reductions through their EMS. The Company would send a signal to the customer's EMS, which would then automatically initiate the required load reductions. The Company would require such customers to arrange for an independent engineering assessment to verify that their respective processes will work reliably with the Company's signal. The Company will impose penalties if a customer fails to control

load to a level at or below the customer's firm demand. The EMS option provides the additional benefit of affording less than 10-minute notice customers the ability to have both firm and interruptible load on the same meter.

Q. IS THE USE OF EMS REFLECTED IN THE REVISED ISOC TARIFF?

A. Yes. The "Availability" section of the ISOC tariff has been revised to include a section on control through EMS.

B. MINIMUM CUSTOMER SIZE

Q. WHAT ARE THE NEW TARIFF PROVISIONS GOVERNING MINIMUM INTERRUPTIBLE LOAD?

A. As explained in Mr. Brockett's testimony, the Company is proposing to reduce the minimum Contract Interruptible Load required to be eligible for the ISOC tariff from 500 kW to 300 kW.

Q. IS THE REVISED MINIMUM LOAD REQUIREMENT REFLECTED IN THE REVISED ISOC TARIFF?

A. Yes. The "Availability" section of the ISOC tariff has been revised to include the new minimum size requirements.

C. CONTRACT INTERRUPTIBLE LOAD

Q. PLEASE SUMMARIZE THE CURRENT TARIFF PROVISIONS GOVERNING CONTRACT INTERRUPTIBLE LOAD.

A. Under the current ISOC program Contract Interruptible Load ("CIL") is based on the customer's median load during the previous summer. This approach has served as an appropriate measure of interruptible load for

existing customers, but does not address customers that are new to the system, have no interval data recording meter, or plan to increase their load.

Q. HOW HAS THE TARIFF BEEN CHANGED TO ALLOW ALTERNATIVE METHODS OF CALCULATING THE CONTRACT INTERRUPTIBLE LOAD WHEN HISTORY IS NOT AVAILABLE OR CUSTOMERS ANTICIPATE SIGNIFICANT CHANGES TO THEIR SUMMER PEAK DEMANDS?

A. The "Contract Interruptible Load" section of the tariff has been changed to allow a customer with no history or a customer with an anticipated addition of 100 kW or more to petition the Company for an alternative calculation of their CIL. In either case the customer would receive a credit based on the CIL for the upcoming summer. But this credit would be paid retroactively, after the customer's actual CIL for the summer was calculated.

The section on calculating Contract Interruptible Load based on loads during the previous summer has been replaced by a new provision allowing the CIL to be based on projected loads, with a subsequent true-up. This change will allow for a more current estimate of a customer's CIL.

Q. CAN YOU GIVE AN EXAMPLE OF HOW THESE CHANGES WOULD ALLOW A CUSTOMER THAT HAS NO HISTORY TO JOIN THE PROGRAM?

A. Yes. Suppose that starting in January 2008 a customer wants to join the program, nominates 100 kW of firm demand, but has no history from which to derive a CIL. The customer would get no credit from January through October. However, in October the Company would calculate the customer's median summer demand. If this median load were 500 kW, the customer would have a CIL of 500 kW – 100 kW, or 400 kW. The customer would then receive a lump-sum retroactive credit for the 400 kW of CIL from January through October 2008, and monthly credits starting in November 2008.

Q. CAN YOU GIVE AN EXAMPLE OF HOW A CUSTOMER THAT ANTICIPATES SIGNIFICANT LOAD GROWTH WOULD BE TREATED UNDER THE PROPOSED MODIFICATIONS TO THE CALCULATION OF THE CIL?

A. Yes. Assume an existing customer registered a summer 2007 median demand of 900 kW and a firm demand of 100 kW. The 2007 Contract Interruptible Load would then be 900 kW – 100 kW, or 800 kW. Assume this same customer plans to add equipment in June 2008 that increases both their total load and firm demand by 200 kW.

Starting in June 2008, the customer's firm demand would increase to 100 kW + 200 kW, or 300 kW. Based on a summer 2007 total demand of 900 kW and firm demand of 300 kW, the customer's CIL (under the current program) would be set at 900 kW – 300 kW or 600 kW for the June through October 2008 period. However, in October the Company

would calculate the customer's median summer demands as specified in the tariff at 1150 kW; therefore, the customer would have a Contract Interruptible Load of 1150 kW – 300 kW, or 850 kW. The customer would then receive additional retroactive credits for January through October 2008 based on 850 kW – 600 kW, or 250 kW, and monthly credits based on 850 kW starting in November 2008. This new tariff provision would allow customers to join the ISOC program in a much more timely fashion, but pay credits only when performance has been established.

Q. HAS THE MEASUREMENT OF CONTRACT INTERRUPTIBLE LOAD AND INTERRUPTIBLE DEMAND CHANGED IN THE NEW ISOC TARIFF?

A. Yes. Contract Interruptible Load and Interruptible Demand have previously been measured based on 15-minute demands. The Company's resource plan, however, is based on hourly integrated demands. For this reason, the proposed ISOC tariff bases the measurement of Contract interruptible Load and Interruptible Demand on 1-hour integrated demands.

The "Contract Interruptible Load" and "Interruptible Demand" sections of the ISOC tariff have been revised to reflect the new definitions.

D. SEASONAL RATIOS

Q. WHAT ARE THE CURRENT SEASONAL RATIOS IN THE TARRIF AND HOW WERE THEY DETERMINED?

A. The summer ratio is 130% and the winter ratio is 85%. These ratios were based on the Company's filed demand rate differentials in its most recent Phase II rate case (Docket No. 04A-164E).

Q. ARE THE CURRENT ISOC SEASONAL RATIOS IN LINE WITH THE DEMAND RATE DIFFERENTIALS ULTIMATELY APPROVED BY THE COMMISSION FOR BASE DEMAND CHARGES?

A. No. The demand rate differentials adopted are much lower. Transmission General (TG) demand rates average $4.86, with a summer rate of $5.63 per kW and a winter rate of $4.47 per kW. This results in a TG summer ratio of $5.63/$4.86, or 116%, and a TG winter ratio of $4.47/$4.86, or 92%. Primary General (PG) demand rates average $7.60, with a summer rate of $8.39 per kW and a winter rate of $7.21 per kW. This results in a PG summer ratio of $8.39/$7.60, or 110%, and a PG winter/summer ratio of $7.21/$7.60, or 90%.

Q. ARE YOU PROPOSING TO CHANGE THE SEASONAL RATIOS TO BE MORE IN LINE WITH THE APPROVED SEASONAL DEMAND RATES?

A. Yes. Although the ISOC ratios apply only to monthly bill credits and do not directly affect the seasonal demand charges, both the seasonal ISOC credits and seasonal demand charges are intended to reflect differences in resource costs by season. To align resource payments and system costs, the two ratios should be similar. For this reason, the ISOC credit summer ratio has been lowered to 115%, and the winter ratio has been raised to 90%.

E. CREDIT ADJUSTMENT FACTOR

Q. HOW IS THE CREDIT ADJUSTMENT FACTOR DESCRIBED BY MR. BROCKETT INCORPORATED IN THE TARRIF?

A. The Credit Adjustment Factor is employed in calculating the monthly credit rate. The calculation is detailed in Exhibit No. TJS-3.

F. BUY-THROUGH NOTICE

Q. WHAT ARE THE CURRENT ISOC TARIFF PROVISIONS ECONOMIC BUY-THROUGHS?

A. Under the ISOC program customers have up to 15 minutes after receiving notice to elect to buy-through an economic interruption. The intent of this tariff provision is to give the Company sufficient time (45 minutes) to buy enough energy for the customers who choose to buy-through.

Q. DOES THIS APPROACH WORK WELL FOR THE COMPANY AND ISOC CUSTOMERS?

A. This 15-minute notice provision is necessary and appropriate in cases where a customer is notified at the top of the hour that an interruption will occur during the next hour. However, the Company sometimes knows well in advance that it will call an economic interruption. For example, the Company may want to interrupt a customer four hours from now. Under the current tariff, the customer would still have only 15 minutes to decide whether to buy-through in four hours. Consequently, the customer would be required to provide much more lead-time than the Company needs to purchase the necessary energy.

Q. IS THE COMPANY PROPOSING TARIFF REVISIONS TO ALLOW THE CUSTOMER MORE TIME TO DECIDE WHETHER TO BUY-THROUGH DURING AN ECONOMIC INTERRUPTION?

A. Yes. The "Buy Through – Economic Interruptions" section of the tariff has been changed so that customers must notify the Company 45 minutes prior to the beginning of an Economic Interruption period if they elect to buy-through all or a portion of their available interruptible load.

G. CONTRACT OBLIGATION

Q. WHAT HAPPENS UNDER THE CURRENT TARIFF IF ISOC CUSTOMERS LEAVE THE COMPANY'S SERVICE TERRITORY BEFORE FULFILLING THEIR OBLIGATIONS UNDER THE ISOC TARIFF?

A. Customers will either be assessed a penalty or be required to refund their ISOC credits. Unfortunately, this provision is impossible to enforce if the Customer cannot be found or has gone bankrupt.

Q. WHAT ARE THE NEW TARIFF PROVISIONS GOVERNING CONTRACT CANCELLATION IF CUSTOMER LEAVES SERVICE TERRITORY?

A. A section has been added to the "Early Termination Penalty" section of the tariff specifying that, if a Customer leaves the Company's service territory and cannot be reasonably found or has gone bankrupt, program credits will be discontinued and early termination penalties will be waived.

H. FOUR-HOUR MINIMUM

Q. WHY WAS THE FOUR-HOUR MINIMUM ORGINALLY INCLUDED IN THE ISOC TARIFF?

A. The four-hour minimum was included at the request of customers to avoid many interruptions of very short duration during the year.

Q. WHY WOULD THE COMPANY BE WILLING TO WAIVE THIS PROVISION?

A. The Company believes it can generate additional program value by calling interruptions of less than four hours, because high-cost or low-resource periods can then be matched more precisely with interruption periods. In other words, in certain situations the Company can obtain more value from its interruptible load by interrupting customers more often, but for shorter periods.

Q. WHAT ARE THE NEW TARIFF PROVISIONS GOVERNING THE WAIVER OF FOUR-HOUR MINIMUM LENGTH INTERRUPTIONS?

A. The tariff has been changed to allow a customer to waive the four-hour minimum on all of their load during capacity, contingency and economic interruptions. Under this service option the length of the interruption will be at the Company's discretion.

Q. IS THE COMPANY REQUIRED TO ALLOW THESE LOADS TO RETURN IN LESS THAN FOUR HOURS?

A. No, the Company has complete flexibility. The Company can allow the load to return, change the interruption to an economic interruption or continue to interrupt.

Q. CAN THE COMPANY POTENTIALLY CALL MORE INTERRUPTIONS UNDER THIS PROVISION?

A. Yes. A simple example will illustrate how the Company can call more interruptions. Suppose a customer opts for an annual maximum of 40 hours of interruptions. Also, suppose that the Company needs to interrupt for only 30 minutes on July 1 and 30 minutes on July 2. Under the current tariff, each interruption would need to last for at least 4 hours, leaving 32 hours of usable interruption. But if the Company could call 30-minute interruptions under the terms of the proposed tariff, then the Company would have 39 hours of interruption to use later in the year.

Q. WHY MUST CUSTOMERS SUBJECT ALL OR NONE OF THEIR LOAD TO THE FOUR-HOUR MINIMUM?

A. It would be difficult, from both an administrative and physical standpoint, to manage the program if customers could choose to have only part of their load subject to the four-hour minimum interruption.

Q. HOW HAS THE TARIFF BEEN CHANGED TO ALLOW CUSTOMERS TO WAIVE THE FOUR-HOUR MINIMUM FOR INTERRUPTIONS?

A. New sections have been added to the "Economic Interruption," "Capacity Interruption," and "Contingency Interruption" sections that specify that a

customer can contractually waive the four-hour minimum. The Capacity Availability Index (Ca) has been changed to reflect this option.

Q. WHAT IS THE COMPANY PROPOSING TO DO ABOUT CUSTOMERS THAT HAVE LESS THAN FOUR HOURS OF POTENTIAL INTERRUPTION REMAINING?

A. The Company proposes that that the four-hour minimum interruption provision be waived for all customers that have less than four hours remaining to allow for a single interruption equal to the amount of the customer's remaining hours. That waiver would allow the Company to use more (or all) of an ISOC customer's potential annual hours of interruption.

Q. HAS THE TARIFF BEEN CHANGED TO REFLECT THIS PROVISION?

A. Yes. New sections have been added to the "Economic Interruption," "Capacity Interruption," and "Contingency Interruption" sections of the tariff that permit a single interruption of less than four hours whenever a customer's available hours for interruption fall below four hours.

I. CUSTOMER ADDITIONS

Q. WHEN CAN NEW CUSTOMERS JOIN THE ISOC PROGRAM UNDER THE CURRENT TARIFF?

A. Under the current tariff all new enrollments begin on January 1 of the next year. In other words, a customer that signs up after January 1, 2008, would have to wait until January 2009 to join the program.

Q. WHAT IS THE IMPACT OF THIS ENROLLMENT PROVISION?

A. The potentially long delay in enrollment discourages customers from joining. Potential ISOC customers know what their Contract Interruptible Loads are only after the end of the summer period, i.e., sometime in October or November. They then have only about two or three months to decide whether they want to enroll in the program for the following year.

Q. WHY WAS THE PROGRAM DESIGNED THIS WAY?

A. The interruptible program sets credits and interruptible hours based on a calendar year.

Q. COULD THE PROGRAM BE CHANGED TO ALLOW CUSTOMERS TO JOIN DURING THE YEAR?

A. Yes. However, a method would have to be developed to adjust the number of hours to reflect the partial year and facilitate program administration.

Q. HOW IS THE PROGRAM CURRENTLY ADMINISTERED WITH RESPECT TO INTERRUPTIONS?

A. The program is usually administered so that groups are interrupted together, although individual customers can also be interrupted. In most cases, the operator chooses a group, such as the 40-hour, 1-hour notice group, and interrupts only that group.

Q. HOW COULD NEW CUSTOMERS BE ADDED BY GROUPS WITH AN APPROPRIATE ADJUSTMENT TO THE REMAINING ANNUAL HOURS TO REFLECT THE PARTIAL YEAR?

A. A customer joining for a partial year could be assigned the remaining hours for the group the customer is joining. For example, suppose a new customer joined the program in March 2008 as a 40-hour, 1-hour notice customer. Assume also that the other 40-hour, 1-hour notice customers had been interrupted for 8 hours total during January and February 2008, so that they had 32 hours of interruption remaining as of March 2008. This new customer would be assigned 32 hours of interruption for the remainder of 2008. After 2008, the customer would be on annual calendar-year contracts like the other customers.

Q. SHOULD CUSTOMERS BE ALLOWED TO JOIN THE PROGRAM ANY TIME OF YEAR?

A. Since much of the program value is in the summer months, the Company proposes that customers be allowed to join the interruptible program only through May. For purposes of the interruptible contract, the first year for these customers will consist of their first full January through December calendar year.

Q. HAVE THESE CHANGES BEEN REFLECTED IN THE REVISED TARIFF?

A. Yes. The "Service Period" section of the tariff has been revised to reflect these changes.

IV. BASIC TARIFF SERVICE PRICING AND OPTIONS

Q. IS THE COMPANY PROPOSING TO CHANGE THE WAY CUSTOMER CREDITS VARY WITH THE HOURS OF INTERRUPTION?

A. No. Customers will still receive higher credits per kW of CIL if they sign up for more hours of interruption. Customer credits will be determined through a formula rate, as they have been in the past. A customer's maximum number of annual interruption hours will continue to affect the credit through the Capacity Availability (Ca) and the Number of Hours Available (Ha) indices.

Q. HAVE THE VALUES IN THE CA AND HA INDICES CHANGED?

A. Yes. The 200-hour provision has been dropped as an option, as explained in Mr. Brockett's testimony, and removed from both the Ca and Ha indices. Otherwise, the Ha index is unchanged. The values in the Ca index at 40, 80 and 160 hours have all been updated to reflect the avoided costs and pricing discussed by Mr. Taylor and Mr. Brockett. The Ca index has also been changed to reflect the values associated for opting to waive the 4-hour minimum interruption. The Ca and Ha values are shown in Exhibit No. TJS-3.

Q. HAS THE MONTHLY CREDIT FORMULA CHANGED WITH RESPECT TO THE CA AND HA INDICES?

A. No, the Ca and Ha indices are used to calculate the monthly credit rate as before. This is shown in Exhibit No. TJS-3.

Q. IS THE COMPANY PROPOSING TO CHANGE THE WAY CUSTOMERS ARE CREDITED FOR NOTICE?

A. No. Customers will still receive a higher credit if they agree to shorter notice. These credits are determined through a formula rate, as they have been in the past. The notice length affects the credit through the Notice Factor Index (Nf).

Q. HAVE THE VALUES IN THE NF INDEX CHANGED?

A. Yes. Due to low customer interest, the 8-hour notice provision has been dropped as an option and removed from the Nf index. The Nf index values for less than 10-minute and 1-hour notice customers have been updated based on the work of Mr. Taylor. The Nf index values are shown in Exhibit No. TJS-3.

Q. HAS THE MONTHLY CREDIT FORMULA CHANGED WITH RESPECT TO THE NF INDEX?

A. No, the Nf index is used to calculate the monthly credit rate as before. This is shown in Exhibit No. TJS-3.

Q. HAS THE TARIFF CHANGED WITH RESPECT TO CONSECUTIVE DAYS OF INTERRUPTION?

A. Yes. The previous tariff allowed the Company to call interruptions on consecutive days, limited only by the ISOC customer's total annual hours of interruption. The new tariff maintains this service option, but also provides for an alternative service whereby customers can limit their interruptions to 4 hours in any 24-hour period in return for a lower credit.

This is applicable only to capacity and contingency interruptions, because customers can buy through economic interruptions.

Q. HOW WOULD THIS PROVISION WORK?

A. If a customer is interrupted at 1 p.m. for 4 hours on Monday, then the customer will not be available for another capacity interruption until 1 p.m. on Tuesday. If the customer is interrupted at 2 p.m. on Tuesday for 2 hours, then the customer will not be available for another capacity interruption until noon on Wednesday. In both cases, there must be 20 hours from the end of an interruption to the beginning of the next.

Q. HOW ARE CONSECUTIVE DAYS HANDLED IN THE MONTHLY CREDIT RATE FORMULA?

A. The Capacity Availability Index (Ca) now includes values that reflect the reduced capacity portion of the credit if a customer opts to limit consecutive days of interruption. This is shown in Exhibit No. TJS-3.

Q. HAS THE TARIFF CHANGED WITH RESPECT TO THE MINIMUM NUMBER OF HOURS IN ANY GIVEN INTERRUPTION?

A. Yes. The current tariff requires that each interruption extend at least four hours. Many customers like this provision because it helps them with their planning. However, the minimum requirement reduces the value of the program somewhat, as Mr. Taylor explains. The proposed tariff allows customers to retain the four-hour minimum in return for a lower credit per kW.

Q. HOW IS THE FOUR-HOUR MINIMUM HANDLED IN THE MONTHLY CREDIT RATE FORMULA?

A. The Capacity Availability Index (Ca) now reflects the reduction in the capacity portion of the credit if a customer opts for a minimum interruption period of four hours. This is shown in Exhibit No. TJS-3.

Q. HOW HAS THE CALCULATION OF THE ENERGY PORTION OF THE CUSTOMER CREDIT CHANGED?

A. The formula for the Avoided Energy (Av) credit is unchanged, except that the Energy Charge for service though the transmission system ("Heca") has been updated to reflect the total price, including riders, customers would have paid per kilowatt-hour for energy had they not been interrupted. Heca currently includes only the Energy Cost Adjustment (ECA). The Company proposes that Heca be expanded to include the Base Energy Rate adjusted for the General Rate Schedule Adjustment (GRSA), the ECA, and the Renewable Energy Standard Adjustment (RESA). The price after adjusting for these riders is what the customer would have paid for energy in the absence of the interruption. These factors will all be updated annually, consistent with past practice.

Q. HAS THE TARIFF CHANGED WITH RESPECT TO HOW SYSTEM LOSSES ARE TREATED?

A. No. The proposed tariff and Monthly Credit Rate treat system losses identically as before, as reflected through the System Loss Factor (SLF) index. This is shown in Exhibit No. TJS-3.

Q. HAS THE AVAILABILITY SECTION OF THE TARIFF CHANGED?

A. Yes. Many of the tariff provisions are new and will require systems to be put into place before they can be offered. Specifically, the options of limiting interruptions to 4 hours within a 24-hour period and using a customer's energy management system will require new automated systems. The "Availability" section has been changed to state that these options will be available only when such systems are put into place and tested.

Q. PLEASE DESRIBE THE VARIOUS ISOC PROGRAM COSTS.

A. The ISOC program costs include the costs associated with installing and maintaining equipment for individual program participants, as well as the operating, and capital costs incurred for the entire population of ISOC customers.

Q. HOW ARE COSTS OF SERVING SPECIFIC ISOC CUSTOMERS CURRENTLY RECOVERED?

A. ISOC participants must pay the for the costs of phone lines, switches, engineering and any other expense directly attributable to their participation in the program. These costs are outlined in the tariff and customer contracts.

Q. HOW DOES THE COMPANY PROPOSE TO RECOVER DIRECT COSTS OF THE PROGRAM THAT ARE NOT DIRECTLY ATTRIBUTIBLE TO ANY ONE PARTICIPANT?

A. A new "Customer Charge," section has been added to the tariff that allows the Company to file to recover ISOC participant group costs through a monthly customer charge. These costs will be updated annually with the Company's compliance filing. This monthly customer charge will recover identifiable operating and capital costs necessary to administer the ISOC program. However, as explained in Mr. Brockett's testimony, the Company proposes to recover the incremental ISOC marketing costs from all retail customers through the DSMCA.

V. OBSOLETE AND UNCLEAR LANGUAGE

Q. DOES THE COMPANY PROPOSE TO ELIMINATE ANY DATED AND UNCLEAR LANGUAGE IN THE ISOC TARIFF?

A. Yes. First, the section under "Definitions" that pertained to the partial year when the tariff was initially put into place has been removed. This section is no longer needed, since the program is being implemented on a calendar-year basis.

Second, the value under the "Avoided Energy Cost" section has been eliminated, since it is also shown under the "Monthly Credit."

Third, the "Obligation to Interrupt" section is changed slightly. Specifically, the phrase "Be willing to" has been deleted to clarify that customers must reduce their load.

Q. IS THE COMPANY PROPOSING ADDITIONS TO THE TARIFF?

A. Yes. First, the "Buy-Through-Economic-Interruptions" section has been expanded and modified to incorporate ISOC contract language and the actual interruption process into the tariff, rather than just into the contract.

Second, an adder of $.003/kWh has been included under the "Failure to Interrupt – Economic Interruptions" section. This adder was included in the settlement agreement and has now been incorporated into the tariff.

Third, a new section entitled "Phone Line Requirements" has been added to the tariff. These requirements are also included in the ISOC contracts.

Fourth, a new section entitled "Physical Control" has been added to the tariff. This section outlines the process for customers to join the less than 10-minute notice rate. This section was added to establish a time-line and process for getting new equipment installed, and to define physical control in the tariff as well as in the ISOC contracts. The definition of Physical Control is unchanged.

Fifth, a new section entitled "Limitation of Liability" has been added to the tariff. This section has been lifted from the ISOC contract.

Q. HOW WOULD YOU DESCRIBE THE TARRIF CHANGES OVERALL?

A. The ISOC tariff changes allow more customers to participate, clarify program provisions, eliminate unneeded language and/or incorporate contract provisions.

VI. CONCLUSION

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

Statement of Qualifications

Timothy J. Sheesley

I received a Bachelor of Economics degree in 1987 and a Masters of Economics degree in 1989 both from the University of Colorado at Boulder, a Banking Certificate from the American Banking Association in 1992, and a Masters of Business Administration degree with academic honors in Accounting and Finance from Regis University in Denver in 2005. Before joining Public Service Company of Colorado in 1997, I worked as an economist for the Denver Regional Council of Governments and the Federal Reserve Bank of Kansas City and as a professional researcher at the Center for Economic Analysis at the University of Colorado.

I have numerous publications in energy, regional and agricultural economics and have been quoted by the Wall Street Journal, Bloomberg News Service, Business Week Magazine, Christian Science Monitor, Denver Post, Rocky Mountain News, Denver Business Journal and several other newspapers, radio and television media.

I have extensive experience running sophisticated multi-sector econometric and financial models. I have produced numerous Federal Open Market Committee briefings and taught upper division "Money and Banking" at William Jewell College in Liberty, Missouri, and "Microeconomics" at the University of Colorado at Boulder.

I have a governor's appointment to the Colorado Revenue Estimating Advisory Committee. I serve on the Western Blue Chip Economic Forecast

Panel, the University of Colorado Business Outlook Forum Steering Committee, the Denver Regional Council of Governments Economics Advisory Task Force, and am member of the Economic Club of Colorado.

I have also served as an economic advisor to the Colorado Transportation Commission Strategic Transportation Project, the Smart Growth Leadership Group, Metro Denver Network, the Pueblo Economic Development Economic Committee, and am a former participant in 50 for Colorado.

INTERRUPTIBLE SERVICE OPTION CREDIT

SCHEDULE ISOC

APPLICABILITY

Applicable as an interruptible service option to customers who receive electric service under the Company's General Service rate Schedules SG, PG or TG, including customers that elect optional Net Metering Service under Schedule NM that have agreed to pay for necessary metering to measure the interruptible load. Not applicable to customers who receive electric service under the Company's Standby Service rate Schedules SST, PST, or TST.

AVAILABILITY

Optional service under this rate schedule is available to customers that have entered into a written, signed and dated Interruptible Service Option Agreement that specifies the Contract Firm Demand, as well as the customer specific data necessary for the Company to calculate the customer's Monthly Credit as set forth below.

To qualify under this schedule, a customer must have a Contract Interruptible Load of 300~~500~~ kilowatts or greater, as defined below. Also, customer must achieve an Interruptible Demand of at least 300~~500 kilowatts~~kW during each of the four, summer peak season months of June, July, August and September of the prior year, or, if the customer is a new customer or did not take service from the Company during the prior year at the premises which the customer desires to include on the ISOC program, customer must demonstrate, to the Company's satisfaction, that it is likely to achieve an Interruptible Demand of at least 300 kW during each of the summer peak season months of the current year.

Customers receiving service under the less than ten-minute notice provision of this schedule must provide the Company with physical control of their interruptible load. Physical control for purposes of this schedule shall include control through Company switches and control through the customer's Energy Management System (EMS). EMS is defined broadly to be any automatic customer-owned or leased system capable of controlling the customer's interruptible load by means of an electronic or digital signal initiated by the Company. Before the Company will accept physical control through the customer's EMS, the customer~~s~~ must provide an independent engineering assessment~~s~~, acceptable to the Company, demonstrating that the customer's EMS will reliably respond to Company's interruption signal. Customer must update this assessment annually on the ISOC Contract anniversary date. In the event customer's EMS fails to control load to a level at or below the customer's firm demand, penalties will apply as set forth below.

Customers receiving service under this schedule shall be billed on a calendar month basis, such that the first day of each month shall be the beginning and the last day of each month shall be the end of the monthly billing period.

Customer may elect to limit interruptions to four hours (4 hrs.) in a twenty four-hour (24-hr.) period, to waive the four-hour minimum interruption and to control interruptions

through customer's EMS. These options shall be available only after the Company has developed systems to manage these programs and has tested and approved their use on a customer-by-customer basis.

~~If a facility is sold, current ISOC Customer's may assign their contract to the new owners, subject to the discretion of the company that the facility use is not changing.~~

CUSTOMER CHARGE

~~All~~ Each ISOC Customers will pay a monthly customer charge ~~to~~that will recover the direct costs associated with ISOC program implementation and administration, including both operations and maintenance expense and the ongoing ownership costs associated with any capital investments made to implement the program. ~~not attributable to any single customer in addition to phone line, switching gear and other costs attributable to specific customers. Customer charges will be reset yearly to recover identifiable program administration, capital and marketing costs.~~

CONTRACT INTERRUPTIBLE LOAD

The Contract Interruptible Load for each calendar year shall be equal to the median of the customer's maximum daily 1-hour ~~15 minute~~ integrated kW demands occurring between the hours of 12:00 noon and 8:00p.m., Monday through Friday, excluding federal holidays, during the period June 1 through September 30 of the prior year. The Company shall calculate the Contract Interruptible Load before January 1st of each year. If the Company determines that the Contract Interruptible Load is less than three hundred~~500 300~~ kilowatts (300 kW), then the Interruptible Service Option Agreement shall terminate at the ~~end of the then current contact term. Customers in their~~ second through nth year on this schedule may have certain ~~daily peak demands described above, which occur on~~ interruption days, imputed for determining the Contract Interruptible Load for the following year.

If a customer has no history or a customer anticipates that its Contract Interruptible Load during the current calendar year will exceed the prior calendar year's CIL by one hundred kilowatts (100 kW) or more, the customer may request that the Company determine its Contract Interruptible Load based on its maximum daily 1-hour integrated kW demands occurring between the hours of 12:00 noon and 8:00 p.m. Monday through Friday, excluding federal holidays, during the period June 1 through September 30 of the current year. For customers who request the Company to determine their CIL based on the current year's demand history, any increase in the credits owing, or the case of a customer with no history, any credit owing under this tariff, will be paid retroactively, in November, after the Contract Interruptible Load calculation is completed. Customers with no history will receive no credit until this time.

CONTRACT FIRM DEMAND

The Contract Firm Demand is that portion of the customer's total load that is not subject to interruptions by Company, as specified in the Interruptible Service Option Agreement.

INTERRUPTIBLE DEMAND

The Interruptible Demand, determined by meter measurement, shall be the maximum 1-hour ~~fifteen (15) minute~~ integrated kilowatt demand used during the month, less the Contract Firm Demand, if any, but not less than zero. Interruptible Demand is measured between the hours of 12:00 noon to 8:00 p.m. Monday through Friday, excluding federal holidays.

~~DEFINITIONS~~

Number of Interruptible Hours (Ha). The number of hours in the year that each customer elects as interruptible as set forth in the Interruptible Service Option Agreement. The options for Ha are 40 hours, 80 hours, and 160 hours.

~~The number of hours a customer will be interrupted is prorated for the partial year of 2005. The calculation is based on the percent of credit paid in the partial year as compared to the annual credit. The calculation for the partial year of June through December is 4 months at 130 percent credit plus 3 months at 85 percent credit equals 7.75. This is divided by 12 months at 100 percent credit to get 64.6 percent of the annual hours.~~

~~Annual Hours~~	~~2005 Partial Year Hours~~
~~40~~	~~26~~
~~80~~	~~52~~
~~160~~	~~103~~
~~200~~	~~129~~

Capacity Availability (Ca). A percentage based on the Number of Interruptible Hours (Ha) set forth in the Interruptible Service Option Agreement. The Ca applicable to each Ha option is as follows:

Interruption Hours

Ha	Ca Unconstrained 4-hour Minimum	Ca Unconstrained No 4-hour Minimum
40 hours	77%	76%
80 hours	88%	88%
160 hours	95%	95%

Ha	Ca 4-hr/24-hr 4-hour Minimum	Ca 4-hr/24/hr No 4-hour Minimum
40 hours	70%	69%
80 hours	77%	76%
160 hours	80%	79%

- Unconstrained for purposes of this tariff means that interruptions may be of any duration, subject only to the applicable minimum, and, for purposes of Capacity and Contingency Interruptions may be called multiple times within any 24 hour period.

Notice Factor (Nf). A percentage based on the amount of advance notice that each customer elects to receive prior to interruption, as set forth in the Interruptible Service Option Agreement. The Nf is as follows:

Advance Notice	Nf
<10~~Nine~~ minutes~~Less than 10 minutes~~	
202~~182~~%	
One hour	100%
~~Eight hours~~	~~68%~~

System Loss Factors (Slf). The System Loss Factors are as follows:

Delivery Level	Slf
Secondary Distribution Voltage	1.0500
Primary Distribution Voltage	1.0235
Transmission Voltage	1.0000

~~Minimum Duration (Md). The Minimum Duration Factor for all types of interruptions are as follows:~~

	~~No Minimum~~	~~4-hour Minimum~~
~~Minimum Duration~~	~~100%~~	~~95%~~

Avoided Energy Cost (Av). ~~The Avoided Energy Cost is $0.00194 per kilowatt-hour ($/kWh).~~ The Avoided Energy Cost shall be updated annually on January 1 at the time the Company updates its Electric Commodity Adjustment ("ECA") to reflect gas prices in the ECA.

MONTHLY CREDIT

The Monthly Credit shall be calculated by multiplying the Monthly Credit Rate (MCR) by the lesser of the customer's Contract Interruptible Load or the actual Interruptible Demand during the billing month.

The MCR shall be revised effective January 1 each year, and shall remain in effect for the calendar year. The MCR shall vary by season. The summer season shall be June 1 through September 30, and the winter season shall be October 1 through May 31. The MCR shall be calculated separately for each customer using the following equation:

Summer Monthly Credit, per kW-month:

MCR =[($6.104~~.79~~ * Ca * Nf * Md) + ($0.00142~~94~~ * Ha)] * Slf * 115~~30~~%

Winter Monthly Credit, per kW-month:

MCR =[($6.104~~.79~~ * Ca * Nf * Md) + ($0.00142~~94~~ * Ha)] * Slf * 90~~85~~%

SERVICE PERIOD

Customer~~'~~s may sign up to join this program for the next calendar year at any time and also may elect to join the program for the current calendar year in January through May. Customer~~'~~s that choose the option to join for the current calendar year will have their Number of Interruptible Hours reduced to the ~~total~~ average remaining hours for the class

with the same annual hours and notice provisions. The annual hours will not be reduced if there are no other members in the class. Company reserves the right to eliminate certain classes and options on an annual basis based on participation~~if too few customers select those particular options. In the Company's sole discretion,~~ Customer shall be permitted~~s will be given the opportunity~~ to amend~~select other options,~~ or to terminate the Interruptible Service Option Credit Agreement without ~~early termination~~ penalty if the Company changes its tariff to~~decides to~~ eliminate those ISOC service options that have been elected by the customer~~ has selected~~. N

C~~All c~~ontracts for service under this schedule shall be for an initial two-year term, with automatic one-year renewal terms. Customers that join the program for the current calendar year will have an initial contract period of two-calendar years plus the remainder of the current calendar year. Only the first current calendar year will be considered under the Trial Period Provisions of this tariff.

A customer must provide the Company written six months notice to cancel service under this schedule.

TRIAL PERIOD PROVISION

Any time during the first year of ~~service under~~service under this schedule a customer may opt to cancel its contract by returning all monthly credits paid by the Company up until the date of cancellation. No additional payment will be assessed. Economic buy-through and Economic buy-through penalty charges shall not be refunded. Capacity Interruption penalties shall be refunded.

EARLY TERMINATION PENALTY

Any customer who cancels service without complying with the Service Period requirements under this schedule shall be required to pay to the Company, as a penalty, an amount equal to the product of one hundred ~~and~~ ten percent (110%) times the customer's Contract Interruptible Load times the customer's MCR for each of the remaining months of the unexpired contract term.

In addition, the customer shall reimburse the Company for the direct cost incurred by the Company for equipment (including its installation cost, less salvage value) to measure the customer's Interruptible Demand and to interrupt the customer. The Company will waive early termination penalties if a customer has filed for bankruptcy protection or cannot be found with reasonable effort because they have left~~If a Customer leaves~~ the Company's service territory~~, program credits will be discontinued and early termination penalties will be waived.~~

OBLIGATION TO INTERRUPT

When the Company ~~asks~~directs the customer to interrupt its available ~~I~~Interruptible Load for capacity and/or contingency interruptions, the customer must~~ be willing to~~ reduce its load to the level of customer's Contract Firm Demand, or the appropriate penalties will be enforced.~~.~~

ECONOMIC INTERRUPTIONS

The Company reserves the right to call an Economic Interruption for one or more customers once per day when the Company believes, in its sole discretion, that calling an interruption will lower its overall system costs compared to what the overall system cost would be in the absence of the interruption. The duration of any Economic Interruption shall not be less than four hours, unless a cCustomer has opted to ~~contractwaiver~~waive the four-hour minimum. ~~provisiondurationCustomer's who sign a waiver opting to waive the four hour minimum duration may not be required to use up all of their available annual hours of controls each year.~~ In addition, the Company may call a single interruption equal to the customer's remaining hours available for interruption, for any customer who~~of less than four hours is permitted~~ has less than four hours of interruption available.~~in the final month of the year to use the remaining hours.~~ Customers under the less than 10-minute and 1-hour notice provisions will have at least 1-hour notice of an Economic Interruption. ~~Customer under the 8 hour notice provision will have 8 hours notice of an Economic Interruption.~~

BUY THROUGH - ECONOMIC INTERRUPTIONS

~~Customers will have 15 minutes after being notified of an economic interruption to elect to buy through all or a portion of their available interruptible load.~~The Company will notify customers of an Economic Interruption via the contact methods identified on the Contact Information Sheet as part of the Interruptible Service Option Credit Agreement. Customers must notify the Company forty-five (45) ~~-~~minutes prior to the start of an Economic Interruption if they elect to buy-through all or a portion of their available interruptible load by logging into the ISOC Web Site at the address provided on the Interruptible Service Option Credit Agreement and indicate their buy-through request for each hour of the Economic Interruption period. The ISOC Web Site ~~Such notice~~ shall advise customers of the Company's best estimate of the buy-through price for each hour of the Economic Interruption period. The buy-through price shall be the actual cost of buy-through energy incurred by the Company. The actual cost shall be calculated by taking the weighted average cost, as determined by the Company's Cost Calculator or its successor, plus three (3) mils per kWh, for the block of electricity used to serve the customer(s) who elected to buy-through.

For purposes of this calculation, the Company shall assume that the block of electricity used is the highest cost block of electricity consumed in each buy-through hour. ~~Once the Company has called an Economic Interruption, the Company agrees to provide interruptible customers, by electronic mail delivered to the address as specified in the Interruptible Service Option Agreement, with the estimated buy-through price for each hour of the four-hour interruption period.~~ Customers who elect to buy-through the Economic Interruption must continue to buy-through all hours of the interruption period unless the Company notifies cCustomers of an updated buy-through price for any hour of the interruption that exceeds the original estimated buy-through price for the hour in question, whereupon any customer that elected initially to buy-through the Economic Interruption will have 15 minutes

after being notified of the updated estimated price to advise the Company that such customer desires to be interrupted at the start of the next hour. Once a customer chooses to interrupt, the customer will be interrupted for the remainder of the interruption period as determined by the Company. The minimum duration of any Economic Interruption under this Paragraph shall be four hours from the time that the Company designated when it first called for the Economic Interruption.

If the Company chooses to extend an Economic Interruption from the original notification, all ISOC cCustomers affected by Economic Interruption will be notified and given the opportunity to buy-through or interrupt for the duration of the Economic Interruption extension period. Economic Interruption extensions may be less than 4 hours in duration. ~~with an updated estimate of the buy-through price once each hour during the interruption. If the updated estimate exceeds the estimated buy-though price first provided to the interruptible customer(s) then any customer that elected initially to buy through the Economic Interruption will have 15 minutes after being notified of the updated estimate to advise the Company that such customer desires to be interrupted at the start of the next hour. Once a customer chooses to interrupt, the customer will be interrupted for the remainder of the interruptible period as determined by the Company. The minimum duration of any Economic Interruption under this Paragraph shall be four hours from the time that the Company designated when it first called for the Economic Interruption.~~

Customers may provide advance election to buy-though up ~~to~~ through a specified price. Such election shall be made no later than the last business day prior to the first day of the month to which the election will apply and shall be delivered to the customer's Xcel Energy ~~s~~Service ~~representative~~ Representative by electronic mail. ~~as provided in the customer's Interruptible Service Option Agreement.~~ Any customer with a standing buy-though order shall have the option, up to~~within, the 15 minute~~ forty-five (45)- minutes before the start of an event ~~notice period~~, to advise the Company that it desires to be interrupted. Further, in the event that the buy-though price exceeds the customer-specified price, the customer may nevertheless elect to buy-though the interruption by providing the Company with the required notice up to ~~within 15~~ forty-five (45) minutes before the start of an event.

FAILURE TO INTERRUPT - ECONOMIC INTERRUPTIONS

In the event that any customer fails to interrupt during an Economic Interruption, the customer will be deemed by the Company to have failed to interrupt for all demand that the customer was obligated to interrupt but did not interrupt. The failure-to-interrupt charge shall be equal to the highest incremental price for power during the Economic Interruption plus 3 mils, as determined by the Company after the fact, including market costs, unit start-up cost, spinning reserve costs and reserve penalty cost, if any. The charge will only apply to the portion of the load the customer fails to interrupt.

CAPACITY INTERRUPTIONS

The Company reserves the right to call a Capacity Interruption for one or more customers at any time when the Company believes, in its sole discretion, that generation or transmission capacity is not sufficiently available to serve its firm load obligations other than obligations to make intra-day energy sales. The duration of any Capacity Interruption shall not be less than four hours, unless a ~~C~~customer has opted ~~contractwaiver~~to waive the four-hour minimum ~~provision~~duration. ~~Customer's who sign a waiver opting to waive the four-hour minimum duration may not be required to use up all of their available annual hours of controls each year.~~ In addition, a single interruption of less than four-hours is permitted if a customer has less than four hours to use the remaining hours~~in the final month of the year to use the remaining hours~~.

CONTINGENCY INTERRUPTION

The Company reserves the right to call a Contingency Interruption for one or more customers receiving service under the less than 10-minute notice provision at any time when the Company believes, in its sole discretion, that interruption is necessary for the Company to be able to meet its disturbance control standard (DCS) criteria. The duration of any Contingency Interruption shall not be less than four hours, unless a ~~C~~customer has opted ~~contractwaiver~~to waive the four-hour minimum ~~provision~~duration. ~~Customer's who sign a waiver opting to waive the four hour minimum duration may not be required to use up all of their available annual hours of controls each year.~~ In addition, a single interruption of less than four-hours is permitted if a customer has less than four-hours of interruption available ~~in the final month of the year~~ to use the remaining hours.

NO MINIMUM DURATION OPTION

Any interruptible customer may waive the four (4) hour minimum duration for all of their Interruptible L~~l~~oad by notifying the Company in writing of such choice prior to January 1 of each year ~~at the time the Customer advises the Company of its Contract Interruptible Load for the following year.~~ The c~~C~~ustomer's choice shall be effective for twelve calendar months commencing January 1 following the Company's receipt of written notice of the waiver. ~~Customer's who sign a waiver opting to waive the four-hour minimum duration may not be required to use up all of their available annual hours of controls each year.~~

The Company retains sole discretion to determine the duration of the interruption that it requires from such customers that have waived the four (4) hour minimum duration. ~~Company has sole discretion to determine whether it still requires interruption of the Waiver Load. Customer shall not take any action to restart its equipment that is subject to the waiver until the earlier of 1) Company granting permission for the start-up or 2) the end of the Interruption Period. In the event a customer restarts its equipment without Company approval, the customer is subject to the provisions under Failure to Interrupt sections.~~

~~Whenever the Company gives permission to restore Load before the end of the called Capacity or Contingency Interruption period as set forth herein, Company shall advise the Customer whether the remainder of the called period will be considered to be an Economic Interruption period or a No Interruption period. If Company determines that the remainder of the period shall be considered to be an Economic Interruption, Company shall advise Customer of the buy-through price.~~
~~Before a Customer may avail itself of the Four Hour Minimum Duration Waiver Option, the Customer must install such equipment as necessary to permit the Company to moniter the customer's load in real-time. Any additional equipment required to accomplish this shall be at the customer's expense. The Company at its sole discretion may call Capacity or Contingency Interruptions of less than four (4) hours at any time for the load under this provision.~~

FAILURE TO INTERRUPT - CAPACITY & CONTINGENCY INTERRUPTIONS
In the event a~~the~~ customer who is directed to interrupt fails to interrupt during a capacity or contingency interruption, the customer shall pay the Company fifty percent (50%) percent of the customer's expected annual credit for all demand that the customer was obligated to interrupt but did not interrupt. The penalty will apply only to the portion ~~of the load that the customer fails to interrupt. After the~~ customer fails to interrupt twice, the Company shall have the option to cancel the Interruptible Service Option Agreement. If the contract is cancelled, the customer shall not be eligible for service under this rate schedule for a minimum of one year, and the customer will not be liable for the Early Termination Penalty.

For determining compliance after capacity and contingency interruptions, the first and last fifteen-minute interval of each event shall not be considered. If a ~~C~~customer's violation for a capacity or contingency interruption is less than 60 minutes in duration not including the first and last control period intervals, then the ~~C~~customer's penalty shall be reduced by 75% if the violation is 15 minutes or shorter, shall be reduced by 50% if the violation is 16 to 30 minutes in duration and shall be reduced by 25~~75~~% if the violation is 31 to 59 minutes. This provision does not apply to Economic Interruptions. ~~-~~

If a less than 10 minute notice option ~~C~~customer utilizing equipment where Xcel Energy physically controls the customer's load through the operation of a Company installed, operated and owned disconnect switch, violates a capacity or contingency interruption ~~while using Company-owned equipment to effect said interruption,~~ the ~~C~~customer shall not be penalized unless evidence of tampering or bypassing the direct load control of the company is in evidence. If tampering or bypassing the direct load control of the Company is evident, the Company may remove the ~~C~~customer from the ~~nine~~less than ten-minute notice option and place the ~~C~~customer on the one-hour notice option rate for a minimum one-year period. The customers' credits shall be adjusted accordingly. In addition, the Customer shall pay 50% of the annual credit rate times the amount of load that the ~~C~~customer failed to remove as a penalty.

If a less than 10-~~-~~minute notice option ~~C~~customer utilizing equipment where Xcel Energy provides a signal to the customer and the customer's equipment is used to reduce load violates a capacity or contingency interruption, the customer shall pay 50% of the annual

credit rate times the amount of load that the ~~C~~customer failed to remove as a penalty and in addition the Company may remove the ~~C~~customer from the less than 10-mintue notice option and place the ~~C~~customer on the one hour notice option rate for a minimum one-year period. The ~~C~~customer's credits shall be adjusted accordingly.

PHONE LINE REQUIREMENTS

All ISOC ~~C~~customers will be required to install a dedicated analog phone line to the meter location. The customer's phone line must be installed and working before the customer may receive service under this tariff.~~Less than 10-minute notice option Customers must also provide a dedicated analog phone line with the 'distinctive ring' feature. Phone line and distinctive ring feature must be installed and working before the customer may join the rate.~~ The Company may elect to obtain the phone line for less than ten-minute notice customers with the cost charged to the customer.

Customers shall be notified by email when their phone line used to communicate interruptions to the Company's Remote Terminal Unit is not working. Customers must repair the phone line within two (2) weeks of notification. If the ~~C~~customer does not repair the phone line within 2 weeks of notification by the Company, ~~the~~less than 10-minute notice ISOC option ~~customer shall~~customer shall be moved to the one-hour notice option until the phone line is repaired and tested. The customer's credits shall be adjusted accordingly. In the event that the Company issues a capacity or contingency interruption during a time in which the ~~C~~customer's phone line is not working, all applicable penalties shall apply if the customer fails to comply with the interruption.

PHYSICAL CONTROL

For those customers who select the ~~nine~~less than ten-minute notice ISOC option there are two sub-options.

1. Customers may choose to utilize their own EMS automated intelligent equipment to reduce load down to the Contract Firm Demand level when requested by the Company. Customer will pay for the cost of a remote terminal unit (RTU) that will receive the interruption and resotre signals via phone or cellular communication. The RTU shall be designed, purchased, installed and tested by the Company or Company contractor at the ~~C~~customer's expense. The ~~C~~customer must demonstrate that their automated intelligent device/equipment will receive the Company's signal and automatically act upon that signal to remove load down to the Contract Firm Demand Level within a time period to be specified in the Interruptible Service Option Credit Agreement. A $1,000 non-refundable deposit is required to perform the engineering and design work required to determine the costs associated with purchasing and installing the RTU. ~~r~~

2. Customers may choose to utilize a Company owned and operated switch to remove their entire load during a capacity or contingency interruption. The customer must pay for the cost of the company-owned switch and RTU ~~the Company must have remote and automatic control over the customer's entire interruptible load if using the Company's switch. All customers selecting the less than 10-minute notice option for which the Company does not have remote and automatic control over their entire interruptible load, must pay for the cost of a remote terminal unit~~ that will receive the interruption and restore signals via phone ~~line~~or cellular communication, and lock the customer's load out during a capacity or contingency interruption. The remote terminal unit shall be

designed, purchased, installed and tested by the Company at the ~~C~~customer's expense. A $1000 non-refundable deposit is required to perform the engineering and design work need to determine the costs associated with providing the Company physical control over the ~~C~~customer's load. A minimum of 6 months is required to design, order, install and test the required equipment to give the Company ~~complete and physical~~ control over the customer's load. During a capacity or contingency interruption, the Company shall lock out the customer's load to prevent the customer from terminating the interruption before release.— Sub-Option 2 is not available to customers receiveing secondary service from the Company.

All ~~C~~customers who select the ~~nine~~less than ten-minute notice option shall submit to equipment testing at least once per year at the Company's discretion and provided no other capacity or contingency events occurred in the past 12 months that could be used to verify the correct operation of the disconnect equipment and RTU. Equipment testing may last less than the four~~4~~-hour duration and may not count toward the customer's Annual Interruptible Hours. Before joining the rate the customer must complete a verification test to prove their load will drop off in ~~nine~~less than ten-minutes notice and must also demonstrate that their load is physically locked out by the Company's remote terminal unit to prevent their interruptible load from restoring before restore signal is received.

LIMITATION OF LIABILITY

In addition to limitations of liability contained elsewhere in the Company's tariff, ~~C~~customers who elect to take service under the ISOC program shall agree to indemnify and save harmless the Company from all claims or losses of any sort due to death or injury to person or property resulting from interruption of electric service under the ISOC program or from the operation of the interruption signal and switching equipment.

PUBLIC SERVICE COMPANY OF COLORADO

P.O. Box 840
Denver, CO 80201-0840

Second Revised Sheet No. 90

Sub. First Revised Cancels Sheet No. 90

ELECTRIC RATES

RATE

INTERRUPTIBLE SERVICE OPTION CREDIT

C

SCHEDULE ISOC

APPLICABILITY

Applicable as an interruptible service option to customers who receive electric service under the Company's General Service rate Schedules SG, PG or TG, including customers that elect optional Net Metering Service under Schedule NM that have agreed to pay for necessary metering to measure the interruptible load. Not applicable to customers who receive electric service under the Company's Standby Service rate Schedules SST, PST, or TST.

AVAILABILITY

Optional service under this rate schedule is available to customers that have entered into a written, signed and dated Interruptible Service Option Agreement that specifies the Contract Firm Demand, as well as the customer specific data necessary for the Company to calculate the customer's Monthly Credit as set forth below.

To qualify under this schedule, a customer must have a Contract Interruptible Load of 300 kilowatts or greater, as defined below. Also, customer must achieve an Interruptible Demand of at least 300 kW during each of the four, summer peak season months of June, July, August and September of the prior year, or, if the customer is a new customer or did not take service from the Company during the prior year at the premises which the customer desires to include on the ISOC program, customer must demonstrate, to the Company's satisfaction, that it is likely to achieve an Interruptible Demand of at least 300 kW during each of the summer peak season months of the current year.

Customers receiving service under the less than ten-minute notice provision of this schedule must provide the Company with physical control of their interruptible load. Physical control for purposes of this schedule shall include control through Company switches and control through the customer's Energy Management System (EMS). EMS is defined broadly to be any automatic customer-owned or leased system capable of controlling the customer's interruptible load by means of an electronic or digital signal initiated by the Company. Before the Company will accept physical control through the customer's EMS, the customer must provide an independent engineering assessment, acceptable to the Company, demonstrating that the customer's EMS will reliably respond to Company's interruption signal. Customer must update this assessment annually on the ISOC Contract anniversary date.

(Continued on Sheet No. 90A)

ADVICE LETTER NUMBER 1495

ISSUE DATE November 1, 2007

DECISION NUMBER

VICE PRESIDENT, Policy Development

EFFECTIVE DATE January 1, 2008

PUBLIC SERVICE COMPANY OF COLORADO

P.O. Box 840
Denver, CO 80201-0840

First Revised Sheet No. 90A

Sub. Original Cancels Sheet No. 90A

ELECTRIC RATES

RATE

INTERRUPTIBLE SERVICE OPTION CREDIT

C

SCHEDULE ISOC

AVAILABILITY - Cont'd

In the event customer's EMS fails to control load to a level at or below the customer's firm demand, penalties will apply as set forth below.

Customers receiving service under this schedule shall be billed on a calendar month basis, such that the first day of each month shall be the beginning and the last day of each month shall be the end of the monthly billing period.

Customer may elect to limit interruptions to four hours (4 hrs.) in a twenty four-hour (24-hr.) period, to waive the four-hour minimum interruption and to control interruptions through customer's EMS. These options shall be available only after the Company has developed systems to manage these programs and has tested and approved their use on a customer-by-customer basis.

CUSTOMER CHARGE

Each ISOC Customer will pay a monthly customer charge that will recover the direct costs associated with ISOC program implementation and administration, including both operations and maintenance expense and the ongoing ownership costs associated with any capital investments made to implement the program.

CONTRACT INTERRUPTIBLE LOAD

The Contract Interruptible Load for each calendar year shall be equal to the median of the customer's maximum daily 1-hour integrated kW demands occurring between the hours of 12:00 noon and 8:00 p.m. Monday through Friday, excluding federal holidays, during the period June 1 through September 30 of the prior year. The Company shall calculate the Contract Interruptible Load before January 1st of each year. If the Company determines that the Contract Interruptible Load is less than three hundred kilowatts (300 kW), then the Interruptible Service Option Agreement shall terminate at the end of the then current contact term. Customers in their second through nth year on this schedule may have certain daily peak demands described above, which occur on interruption days, imputed for determining the Contract Interruptible Load for the following year.

(Continued on Sheet No. 90B)

ADVICE LETTER NUMBER 1495

ISSUE DATE November 1, 2007

DECISION NUMBER

VICE PRESIDENT, Policy Development

EFFECTIVE DATE January 1, 2008

PUBLIC SERVICE COMPANY OF COLORADO

P.O. Box 840
Denver, CO 80201-0840

First Revised Sheet No. 90B

Sub. Original Cancels Sheet No. 90B

ELECTRIC RATES

RATE

INTERRUPTIBLE SERVICE OPTION CREDIT

C

SCHEDULE ISOC

CONTRACT INTERRUPTIBLE LOAD - Cont'd

If a customer has no history or a customer anticipates that its Contract Interruptible Load during the current calendar year will exceed the prior calendar year's CIL by one hundred kilowatts (100 kW) or more, the customer may request that the Company determine its Contract Interruptible Load based on its maximum daily 1-hour integrated kW demands occurring between the hours of 12:00 noon and 8:00 p.m. Monday through Friday, excluding federal holidays, during the period June 1 through September 30 of the current year. For customers who request the Company to determine their CIL based on the current year's demand history, any increase in the credits owing, or the case of a customer with no history, any credit owing under this tariff, will be paid retroactively, in November, after the Contract Interruptible Load calculation is completed. Customers with no history will receive no credit until this time.

CONTRACT FIRM DEMAND

The Contract Firm Demand is that portion of the customer's total load that is not subject to interruptions by Company, as specified in the Interruptible Service Option Agreement.

INTERRUPTIBLE DEMAND

The Interruptible Demand, determined by meter measurement, shall be the maximum 1-hour integrated kilowatt demand used during the month, less the Contract Firm Demand, if any, but not less than zero. Interruptible Demand is measured between the hours of 12:00 noon to 8:00 p.m. Monday through Friday, excluding federal holidays.

DEFINITIONS

Number of Interruptible Hours (Ha). The number of hours in the year that each customer elects as interruptible as set forth in the Interruptible Service Option Agreement. The options for Ha are 40 hours, 80 hours, and 160 hours.

Capacity Availability (Ca). A percentage based on the Number of Interruptible Hours (Ha) set forth in the Interruptible Service Option Agreement. The Ca applicable to each Ha option is as follows:

(Continued on Sheet No. 90C)

ADVICE LETTER NUMBER 1495

ISSUE DATE November 1, 2007

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VICE PRESIDENT, Policy Development

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PUBLIC SERVICE COMPANY OF COLORADO

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Denver, CO 80201-0840

Third Revised Sheet No. 90C

Second Revised Cancels Sheet No. 90C

ELECTRIC RATES

RATE

INTERRUPTIBLE SERVICE OPTION CREDIT

C

SCHEDULE ISOC

DEFINITIONS - Cont'd

Interruption Hours

Ha	Ca Unconstrained* 4-hour Minimum	Ca Unconstrained* No 4-hour Minimum
40 hours	77%	76%
80 hours	88%	88%
160 hours	95%	95%

Ha	Ca 4-hr/24-hr 4-hour Minimum	Ca 4-hr/24/hr No 4-hour Minimum
40 hours	70%	69%
80 hours	77%	76%
160 hours	80%	79%

- Unconstrained for purposes of this tariff means that interruptions may be of any duration, subject only to the applicable minimum, and, for purposes of Capacity and Contingency Interruptions may be called multiple times within any 24-hour period.

Notice Factor (Nf). A percentage based on the amount of advance notice that each customer elects to receive prior to interruption, as set forth in the Interruptible Service Option Agreement. The Nf is as follows:

Advance Notice	Nf
<10 minutes	202%
One hour	100%

System Loss Factors (Slf). The System Loss Factors are as follows:

Delivery Level	Slf
Secondary Distribution Voltage	1.0500
Primary Distribution Voltage	1.0235
Transmission Voltage	1.0000

Avoided Energy Cost (Av). The Avoided Energy Cost shall be updated annually on January 1 at the time the Company updates its Electric Commodity Adjustment ("ECA") to reflect gas prices in the ECA.

(Continued on Sheet No. 90D)

PUBLIC SERVICE COMPANY OF COLORADO

P.O. Box 840
Denver, CO 80201-0840

First Revised Sheet No. 90D

Sub. Original Cancels Sheet No. 90D

ELECTRIC RATES

RATE

INTERRUPTIBLE SERVICE OPTION CREDIT

C

SCHEDULE ISOC

MONTHLY CREDIT

The Monthly Credit shall be calculated by multiplying the Monthly Credit Rate (MCR) by the lesser of the customer's Contract Interruptible Load or the actual Interruptible Demand during the billing month.

The MCR shall be revised effective January 1 each year, and shall remain in effect for the calendar year. The MCR shall vary by season. The summer season shall be June 1 through September 30, and the winter season shall be October 1 through May 31. The MCR shall be calculated separately for each customer using the following equation:

Summer Monthly Credit, per kW-month:

MCR = [($6.10 * Ca * Nf * Md) + ($0.00142 * Ha)] * Slf * 115%

Winter Monthly Credit, per kW-month:

MCR = [($6.10 * Ca * Nf * Md) + ($0.00142 * Ha)] * Slf * 90%

SERVICE PERIOD

Customers may sign up to join this program for the next calendar year at any time and also may elect to join the program for the current calendar year in January through May. Customers that choose the option to join for the current calendar year will have their Number of Interruptible Hours reduced to the average remaining hours for the class with the same annual hours and notice provisions. The annual hours will not be reduced if there are no other members in the class. Company reserves the right to eliminate certain classes and options on an annual basis based on participation. Customer shall be permitted to amend or to terminate the Interruptible Service Option Credit Agreement without penalty if the Company changes its tariff to eliminate those ISOC service options that have been elected by the customer.

Contracts for service under this schedule shall be for an initial two-year term, with automatic one-year renewal terms. Customers that join the program for the current calendar year will have an initial contract period of two calendar years plus the remainder of the current calendar year. Only the first current calendar year will be considered under the Trial Period Provisions of this tariff.

A customer must provide the Company written six months notice to cancel service under this schedule.

(Continued on Sheet No. 90E)

PUBLIC SERVICE COMPANY OF COLORADO

P.O. Box 840
Denver, CO 80201-0840

First Revised Sheet No. 90E

Original Cancels Sheet No. 90E

ELECTRIC RATES

RATE

INTERRUPTIBLE SERVICE OPTION CREDIT

C

SCHEDULE ISOC

Trial Period Provision

Any time during the first year of service under this schedule a customer may opt to cancel its contract by returning all monthly credits paid by the Company up until the date of cancellation. No additional payment will be assessed. Economic buy-through and Economic buy-through penalty charges shall not be refunded. Capacity Interruption penalties shall be refunded.

EARLY TERMINATION PENALTY

Any customer who cancels service without complying with the Service Period requirements under this schedule shall be required to pay to the Company, as a penalty, an amount equal to the product of one hundred ten percent (110%) times the customer's Contract Interruptible Load times the customer's MCR for each of the remaining months of the unexpired contract term.

In addition, the customer shall reimburse the Company for the direct cost incurred by the Company for equipment (including its installation cost, less salvage value) to measure the customer's Interruptible Demand and to interrupt the customer. The Company will waive early termination penalties if a customer has filed for bankruptcy protection or cannot be found with reasonable effort because they have left the Company's service territory.

OBLIGATION TO INTERRUPT

When the Company directs the customer to interrupt its available Interruptible Load for capacity and/or contingency interruptions, the customer must reduce its load to the level of customer's Contract Firm Demand, or the appropriate penalties will be enforced.

(Continued on Sheet No. 90F)

ADVICE LETTER NUMBER 1495

ISSUE DATE November 1, 2007

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VICE PRESIDENT, Policy Development

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PUBLIC SERVICE COMPANY OF COLORADO

P.O. Box 840
Denver, CO 80201-0840

First Revised Sheet No. 90F

Original Cancels Sheet No. 90F

ELECTRIC RATES

RATE

INTERRUPTIBLE SERVICE OPTION CREDIT

C

SCHEDULE ISOC

ECONOMIC INTERRUPTIONS

The Company reserves the right to call an Economic Interruption for one or more customers once per day when the Company believes, in its sole discretion, that calling an interruption will lower its overall system costs compared to what the overall system cost would be in the absence of the interruption. The duration of any Economic Interruption shall not be less than four hours, unless a customer has opted to waive the four-hour minimum. In addition, the Company may call a single interruption equal to the customer's remaining hours available for interruption, for any customer who has less than four hours of interruption available. Customers under the less than ten-minute and 1-hour notice provisions will have at least 1-hour notice of an Economic Interruption.

BUY THROUGH - ECONOMIC INTERRUPTIONS

The Company will notify customers of an Economic Interruption via the contact methods identified on the Contact Information Sheet as part of the Interruptible Service Option Credit Agreement. Customers must notify the Company forty-five (45)-minutes prior to the start of an Economic Interruption if they elect to buy-through all or a portion of their available interruptible load by logging into the ISOC Web Site at the address provided on the Interruptible Service Option Credit Agreement and indicate their buy-through request for each hour of the Economic Interruption period. The ISOC Web Site shall advise customers of the Company's best estimate of the buy-through price for each hour of the Economic Interruption period. The buy-through price shall be the actual cost of buy-through energy incurred by the Company. The actual cost shall be calculated by taking the weighted average cost, as determined by the Company's Cost Calculator or its successor, plus three (3) mils per kWh, for the block of electricity used to serve the customer(s) who elected to buy-through.

For purposes of this calculation, the Company shall assume that the block of electricity used is the highest cost block of electricity consumed in each buy-through hour. Customers who elect to buy-through the Economic Interruption must continue to buy-through all hours of the interruption period unless the Company notifies customers of an updated buy-through price for any hour of the interruption that exceeds the original estimated buy-through price for the hour in question, whereupon any customer that elected initially to

(Continued on Sheet No. 90G)

ADVICE LETTER NUMBER 1495

ISSUE DATE November 1, 2007

DECISION NUMBER

VICE PRESIDENT, Policy Development

EFFECTIVE DATE January 1, 2008

PUBLIC SERVICE COMPANY OF COLORADO

P.O. Box 840
Denver, CO 80201-0840

Original Sheet No. 90G

Cancels Sheet No. _____

ELECTRIC RATES

RATE

INTERRUPTIBLE SERVICE OPTION CREDIT

C

SCHEDULE ISOC

BUY THROUGH - ECONOMIC INTERRUPTIONS - Cont'd

buy-through the Economic Interruption will have 15 minutes after being notified of the updated estimated price to advise the Company that such customer desires to be interrupted at the start of the next hour. Once a customer chooses to interrupt, the customer will be interrupted for the remainder of the interruption period as determined by the Company. The minimum duration of any Economic Interruption under this Paragraph shall be four hours from the time that the Company designated when it first called for the Economic Interruption.

If the Company chooses to extend an Economic Interruption from the original notification, all ISOC customers affected by Economic Interruption will be notified and given the opportunity to buy-through or interrupt for the duration of the Economic Interruption extension period. Economic Interruption extensions may be less than four (4) hours in duration.

Customers may provide advance election to buy-though up through a specified price. Such election shall be made no later than the last business day prior to the first day of the month to which the election will apply and shall be delivered to the customer's Xcel Energy Service Representative by electronic mail. Any customer with a standing buy-though order shall have the option, up to forty-five (45)-minutes before the start of an event to advise the Company that it desires to be interrupted. Further, in the event that the buy-though price exceeds the customer-specified price, the customer may nevertheless elect to buy-though the interruption by providing the Company with the required notice up to forty-five (45) minutes before the start of an event.

FAILURE TO INTERRUPT - ECONOMIC INTERRUPTIONS

In the event that any customer fails to interrupt during an Economic Interruption, the customer will be deemed by the Company to have failed to interrupt for all demand that the customer was obligated to interrupt but did not interrupt.

The failure-to-interrupt charge shall be equal to the highest incremental price for power during the Economic Interruption plus 3 mils, as determined by the Company after the fact, including market costs, unit start-up cost, spinning reserve costs and reserve penalty cost, if any. The charge will only apply to the portion of the load the customer fails to interrupt.

(Continued on Sheet No. 90H)

PUBLIC SERVICE COMPANY OF COLORADO

P.O. Box 840
Denver, CO 80201-0840

Original Sheet No. 90H

Cancels Sheet No. ____

ELECTRIC RATES

RATE

INTERRUPTIBLE SERVICE OPTION CREDIT

C

SCHEDULE ISOC

CAPACITY INTERRUPTIONS

The Company reserves the right to call a Capacity Interruption for one or more customers at any time when the Company believes, in its sole discretion, that generation or transmission capacity is not sufficiently available to serve its firm load obligations other than obligations to make intra-day energy sales. The duration of any Capacity Interruption shall not be less than four hours, unless a customer has opted to waive the four-hour minimum duration. In addition, a single interruption of less than four-hours is permitted if a customer has less than four hours of interruption available to use the remaining hours.

CONTINGENCY INTERRUPTION

The Company reserves the right to call a Contingency Interruption for one or more customers receiving service under the less than ten-minute notice provision at any time when the Company believes, in its sole discretion, that interruption is necessary for the Company to be able to meet its disturbance control standard (DCS) criteria. The duration of any Contingency Interruption shall not be less than four hours, unless a customer has opted to waive the four-hour minimum duration. In addition, a single interruption of less than four-hours is permitted if a customer has less than four-hours of interruption available to use the remaining hours.

NO MINIMUM DURATION OPTION

Any interruptible customer may waive the four (4) hour minimum duration for all of their Interruptible Load by notifying the Company in writing of such choice prior to January 1 of each year. The customer's choice shall be effective for twelve calendar months commencing January 1 following the Company's receipt of written notice of the waiver.

The Company retains sole discretion to determine the duration of the interruption that it requires from such customers that have waived the four (4) hour minimum duration.

(Continued on Sheet No. 90I)

ADVICE LETTER NUMBER 1495

ISSUE DATE November 1, 2007

DECISION NUMBER ____

VICE PRESIDENT, Policy Development

EFFECTIVE DATE January 1, 2008

PUBLIC SERVICE COMPANY OF COLORADO

P.O. Box 840
Denver, CO 80201-0840

Original Sheet No. 90I

Cancels Sheet No. _____

ELECTRIC RATES

RATE

INTERRUPTIBLE SERVICE OPTION CREDIT

C

SCHEDULE ISOC

FAILURE TO INTERRUPT - CAPACITY & CONTINGENCY INTERRUPTIONS

In the event a customer who is directed to interrupt fails to interrupt during a capacity or contingency interruption, the customer shall pay the Company fifty percent (50%) percent of the customer's expected annual credit for all demand that the customer was obligated to interrupt but did not interrupt. The penalty will apply only to the portion of the load that the customer fails to interrupt. After the customer fails to interrupt twice, the Company shall have the option to cancel the Interruptible Service Option Agreement. If the contract is cancelled, the customer shall not be eligible for service under this rate schedule for a minimum of one year, and the customer will not be liable for the Early Termination Penalty.

For determining compliance after capacity and contingency interruptions, the first and last fifteen-minute interval of each event shall not be considered. If a customer's violation for a capacity or contingency interruption is less than 60 minutes in duration not including the first and last control period intervals, then the customer's penalty shall be reduced by 75% if the violation is 15 minutes or shorter, shall be reduced by 50% if the violation is 16 to 30 minutes in duration and shall be reduced by 25% if the violation is 31 to 59 minutes. This provision does not apply to Economic Interruptions.

If a less than ten-minute notice option customer utilizing equipment where Xcel Energy physically controls the customer's load through the operation of a Company installed, operated and owned disconnect switch, violates a capacity or contingency interruption the customer shall not be penalized unless evidence of tampering or bypassing the direct load control of the company is in evidence. If tampering or bypassing the direct load control of the Company is evident, the Company may remove the customer from the less than ten - minute notice option and place the customer on the one-hour notice option rate for a minimum one-year period. The customers' credits shall be adjusted accordingly. In addition, the customer shall pay 50% of the annual credit rate times the amount of load that the customer failed to remove as a penalty.

(Continued on Sheet No. 90J)

ADVICE LETTER NUMBER 1495

ISSUE DATE November 1, 2007

DECISION NUMBER _____

VICE PRESIDENT, Policy Development

EFFECTIVE DATE January 1, 2008

PUBLIC SERVICE COMPANY OF COLORADO

P.O. Box 840
Denver, CO 80201-0840

Original Sheet No. 90J

Cancels Sheet No. _____

ELECTRIC RATES

RATE

INTERRUPTIBLE SERVICE OPTION CREDIT

C

SCHEDULE ISOC

FAILURE TO INTERRUPT - CAPACITY & CONTINGENCY INTERRUPTIONS - Cont'd

If a less than ten-minute notice option customer utilizing equipment where Xcel Energy provides a signal to the customer and the customer's equipment is used to reduce load violates a capacity or contingency interruption, the customer shall pay 50% of the annual credit rate times the amount of load that the customer failed to remove as a penalty and in addition the Company may remove the customer from the less than ten-minute notice option and place the customer on the one hour notice option rate for a minimum one-year period. The customer's credits shall be adjusted accordingly.

PHONE LINE REQUIREMENTS

All ISOC customers will be required to install a dedicated analog phone line to the meter location. The customer's phone line must be installed and working before the customer may receive service under this tariff. The Company may elect to obtain the phone line for less than ten-minute notice customers with the cost charged to the customer.

Customers shall be notified by email when their phone line used to communicate interruptions to the Company's Remote Terminal Unit is not working. Customers must repair the phone line within two (2) weeks of notification. If the customer does not repair the phone line within two (2) weeks of notification by the Company, less than ten-minute notice ISOC option customer shall be moved to the one-hour notice option until the phone line is repaired and tested. The customer's credits shall be adjusted accordingly. In the event that the Company issues a capacity or contingency interruption during a time in which the customer's phone line is not working, all applicable penalties shall apply if the customer fails to comply with the interruption.

PHYSICAL CONTROL

For those customers who select the less than ten-minute notice ISOC option there are two sub-options.

(Continued on Sheet No. 90K)

ADVICE LETTER NUMBER 1495

ISSUE DATE November 1, 2007

DECISION NUMBER _____

VICE PRESIDENT, Policy Development

EFFECTIVE DATE January 1, 2008

PUBLIC SERVICE COMPANY OF COLORADO

P.O. Box 840
Denver, CO 80201-0840

Original Sheet No. 90K

Cancels Sheet No. _____

ELECTRIC RATES

RATE

INTERRUPTIBLE SERVICE OPTION CREDIT

C

SCHEDULE ISOC

PHYSICAL CONTROL - Cont'd

1. Customers may choose to utilize their own EMS automated intelligent equipment to reduce load down to the Contract Firm Demand level when requested by the Company. Customer will pay for the cost of a remote terminal unit (RTU) that will receive the interruption and restore signals via phone or cellular communication. The RTU shall be designed, purchased, installed and tested by the Company or Company contractor at the customer's expense. The customer must demonstrate that their automated intelligent device/equipment will receive the Company's signal and automatically act upon that signal to remove load down to the Contract Firm Demand Level within a time period to be specified in the Interruptible Service Option Credit Agreement. A $1,000 non-refundable deposit is required to perform the engineering and design work required to determine the costs associated with purchasing and installing the RTU.

2. Customers may choose to utilize a Company owned and operated switch to remove their entire load during a capacity or contingency interruption. The customer must pay for the cost of the company-owned switch and RTU that will receive the interruption and restore signals via phone or cellular communication, and lock the customer's load out during a capacity or contingency interruption. The remote terminal unit shall be designed, purchased, installed and tested by the Company at the customer's expense. A $1000 non-refundable deposit is required to perform the engineering and design work need to determine the costs associated with providing the Company physical control over the customer's load. A minimum of 6 months is required to design, order, install and test the required equipment to give the Company control over the customer's load. During a capacity or contingency interruption, the Company shall lock out the customer's load to prevent the customer from terminating the interruption before release. Sub-Option 2 is not available to customers receiving secondary service from the Company.

ADVICE LETTER NUMBER 1495

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DECISION NUMBER _____

VICE PRESIDENT, Policy Development

EFFECTIVE DATE January 1, 2008

PUBLIC SERVICE COMPANY OF COLORADO

P.O. Box 840
Denver, CO 80201-0840

Original Sheet No. 90L

Cancels Sheet No. _____

ELECTRIC RATES

RATE

INTERRUPTIBLE SERVICE OPTION CREDIT

C

SCHEDULE ISOC

PHYSICAL CONTROL - Cont'd

All customers who select the less than ten-minute notice option shall submit to equipment testing at least once per year at the Company's discretion and provided no other capacity or contingency events occurred in the past 12 months that could be used to verify the correct operation of the disconnect equipment and RTU. Equipment testing may last less than the four-hour duration and may not count toward the customer's Annual Interruptible Hours. Before joining the rate the customer must complete a verification test to prove their load will drop off in less than ten-minutes notice and must also demonstrate that their load is physically locked out by the Company's remote terminal unit to prevent their interruptible load from restoring before restore signal is received.

LIMITATION OF LIABILITY

In addition to limitations of liability contained elsewhere in the Company's tariff, customers who elect to take service under the ISOC program shall agree to indemnify and save harmless the Company from all claims or losses of any sort due to death or injury to person or property resulting from interruption of electric service under the ISOC program or from the operation of the interruption signal and switching equipment.

ADVICE LETTER NUMBER 1495

ISSUE DATE November 1, 2007

DECISION NUMBER _____

VICE PRESIDENT, Policy Development

EFFECTIVE DATE January 1, 2008

Public Service Company of Colorado
Electric Department
Interruptible Service Option Credit
12 Months Ended December 31, 2007

Derivation of Monthly Credit Rate

Line No.

1 **Monthly Credit Rate Equation:**
2
3 MCR = Monthly Credit Rate
4
5 MCR = [{(C + A + R) * (Tlf) * (Rm) * (Caf) * (Ca) * (Nf) } + {Av * Ha)] * (Slf)
6
7 MCR = [{(C + A + R) * (Tlf) * (Rm) * (Caf) * (Ca) * (Nf) } + {{{{H * G * Tlf) + (VOM * Tlf) - Heca) / 24) * (Caf) * (Ha)}] * (Slf)
8
9 MCR = [{(6.91-0.25-0.25) * (1.0256) * (1.16) * (80%) * (Ca) * (Nf) } +
10 {(0.01045 * 6.69 * 1.0256 + 0.00352 * 1.0256 - 0.03285) / 24 * 80% * Ha}] * (Slf)
11
12 $6.10 = (6.91-0.25-0.25) * (1.0256) * (1.16) * (80%)
13 $0.00145 = (0.01045 * 6.69 * 1.0256 + 0.00352 * 1.0256 - 0.03285) / 24 * 80%
14
15 MCR = [($6.10 * Ca * Nf) + ($0.00142 * Ha)] * (Slf)
16
17 **Summer**
18 **MCR = [($6.10 * Ca * Nf) + ($0.00142 * Ha)] * (Slf) * 115%**
19
20 **Winter**
21 **MCR = [($6.10 * Ca * Nf) + ($0.00142 * Ha)] * (Slf) * 90%**
22
23 **Index Values Common to All Customers - Definitions and 2007 Values**
24
25 Common Index Values

Value		Description	2007 Value Amount
27 MCR	=	Monthly Credit Rate	
28 C	=	Generic Capacity Payment	$6.91 / kW-Mo
29 A	=	AGC Adjustment	($0.25) / kW-Mo
30 R	=	Reactive Power Adjustment	($0.25) / kW-Mo
31 Tlf	=	Transmission Loss Factor, based on losses	1.0256
32 Rm	=	Reserve Margin	1.1600
33 Caf	=	Credit Adjustment Factor	80%
34 H	=	Generic Heat Rate	0.010450 MMBtu / kWh
35 G	=	Generic Delivered Gas Price	$6.690 / MMBtu
36 VOM	=	Variable Operating and Maintenance	$0.00352 / kWh
37 Heca	=	Energy charge at transmission voltage level, $/kWh	
38 Heca	=	Base Energy * (1 + GRSA) + ECA + RESA	
39 Heca	=	0.00276*(1 + 0.1270) +0.02954+0.00020	$0.03285 / kWh
40 Av	=	Avoided Energy Cost converted to $/kWh	
41 Av	=	[(H * G * Tlf) + (VOM * Tlf) - Heca] / 24 * Caf	$0.00142 / kWh

42
43 Generic Delivered Gas Price:
44 [Generic Delivered gas price is based on: Derivation of Public Service Company's "Electric
45 Commodity Adjustment" (ECA), December 2006]

Public Service Company of Colorado
Electric Department
Interruptible Service Option Credit
12 Months Ended December 31, 2007

Customer and Class Specific Indices

Capacity Availability Index (Ca) [Based on number of hours of interruption per year]

Number of Interruptible Hours	Unconstrained no 4-hr min	Unconstrained 4-hour min	4-hr in 24 hr no 4-hr min	4-hr in 24 hr 4-hour min
40 Hours per Year	77%	76%	70%	69%
80 Hours per Year	88%	88%	77%	76%
160 Hours per Year	95%	95%	80%	79%

System Loss Factor Index (Slf)

Service Voltage Level	Slf
Secondary	1.0500
Primary	1.0235
Transmission	1.0000

Number of Hours Available (Ha)

Number of interruptible Hours	Ha
40 Hours per Year	40
80 Hours per Year	80
160 Hours per Year	160

Notice Factor Index (Nf) [Based on amount of notice of interruption provided]

Advance Notice	Nf
< 10 minutes	202%
< 1 hour	100%