

**COLORADO  
ENERGY  
ASSISTANCE  
FOUNDATION**

**Keeping Coloradans Warm**

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April 25, 1995

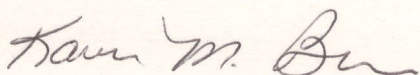
Mr. Roger Colton  
Fisher Sheehan & Colton  
34 Warwick Road  
Belmont, MA 02178

Dear Roger:

Please find enclosed the final report of the Colorado Arrearage Management Project.

Should you have any questions regarding the results of this project, please feel free to contact me. Thank you.

Sincerely,



Karen M. Brown,  
Executive Director

encl.



**COLORADO ARREARAGE MANAGEMENT PROJECT**

**FINAL REPORT**

**March 27, 1995**

**Prepared By**

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**Colorado Arrearage Management  
Project Final Report  
Executive Summary**

**Overview**

The two year Colorado Arrearage Management Project (CAMP) evaluation was designed to answer a number of questions about the effects of arrearage management, weatherization and consumer credit counseling on customer payment performances. It also looked at impacts on the energy vendors' revenue stream. Customers who paid their current monthly bills had one twenty-fourth of their arrearages forgiven for each payment made on time. Payment amounts were averaged across 12 months in average monthly billing plans, based on energy bill histories. Customers in the weatherization group received free weatherization services. Consumer counseling was offered by Consumer Credit Counseling to customers in the counseling sample. Eligibility criteria for customer participation in CAMP required an arrearage of at least \$180 per household and the customer's participation in the Low-income Energy Assistance Program (LEAP) during the 1991-1992 energy assistance season.

**Sample Design**

The eligible population, based on the eligibility criteria, totaled 4,737 households. Random sampling was done to allow evaluation of the three types of service as incentives for regular customer bill payments. Of 2,150 customers sampled, 976 signed contracts and participated in the project. An additional 196 customers were randomly sampled into a control group.

**Evaluation Objectives**

The evaluation was designed to 1) determine the impact of arrearage forgiveness only, weatherization/arrearage forgiveness, and credit counseling/arrearage forgiveness on individuals paying their energy bills; 2) determine the impact of weatherization on energy consumption; 3) determine the payment habits of participants in the test groups compared to those of the control group; 4) statistically compare participants in the arrearage forgiveness, weatherization/arrearage forgiveness, and consumer credit counseling/arrearage forgiveness groups with those in the control group; and 5) determine the financial impact on the participating energy vendor.



## **Measure of Success**

The measure of success or failure was whether or not a shut-off delinquency notice was issued for an account. PSCo's normal decision rules governing the issuance of delinquency notices remained in place for all customers in the project, including those in the control group.

## **Service Group Descriptions**

The average CAMP participant reported a monthly income of \$590, 3.5 family members, a poverty level of 59%, an arrearage at the beginning of the project of \$527 and a PSCo account balance (defined as their arrearage plus current energy usage amount) in the first project month of \$654. The original project intent was to have all the homes in the weatherization sample weatherized and all the customers in the counseling sample counseled. As a result of the small number of weatherized homes and counseled customers, there was limited statistically valid information gained about these two services. This limitation for both samples stemmed from the concern about the differences between those customers who availed themselves of the weatherization or counseling services and those who did not.

## **Evaluation of the Sampling Process**

The sampling process successfully created four comparable groups to test CAMP's arrearage forgiveness factor. No differences were found between the three service groups and the control group for size of household, poverty level, monthly income, race, LEAP participation or social service program participation.

## **Customer Mobility**

CAMP customers were very mobile. Only a small percentage did not move. The majority moved once. All but one of the customers living in weatherized homes moved.

## **Delinquency Notice And Shut-off Delinquency Rates**

Most of the shut-off notices in the control group occurred in the first six months of the project. By the sixth month, half the service group customers had received shut-off notices, and two-thirds failed by the end of the first year. After 24 months, almost all of the control group received at least one shut-off notice compared to about three-quarters of the service group customers. Control group members also received delinquency notices sooner than did the services group customers. With regards to service shut-offs, there were no differences between the service groups and the control group in terms of the percentage of shut-offs after two years. CAMP had little effect on the likelihood of being shut-off, despite the fact that it did



reduce the number of delinquent payment notices for service group customers.

#### **CAMP Participant Payment Performances Prior To The First Shut-off Notice**

The three service groups made higher payments on average, prior to a first shut-off notice being sent, than did the customers in the control group. Customers were not eliminated from the project data collection effort after receiving the first delinquency notice in order to track their payment performances. Service group customers did not receive arrearage forgiveness after the first shut-off notice.

#### **Unpaid Balances At 12 and 24 Months**

At the end of twelve months, the service group customers had higher average arrearages than the control group customers. By the end of the second year, the service groups still did not have a smaller arrearage averages than the control group. The control group matched the arrearage decrease shown by the service customers after 24 months of the project. The control group members should have had higher average arrearage balances than the service group customers, if arrearage forgiveness was to be credited with having a positive impact on payment behaviors.

The control group showed a slightly higher percentage of customers with zero balances than the service group at the end of 24 months. The control group had a higher percentage of customers with arrearages ranging between \$21 and \$180, and it had a smaller percentage with arrearages above \$180.

The service group customers did not do well in availing themselves of the opportunity to eliminate their arrearages through CAMP. The control group did about as well as the service groups in this regard.

#### **CAMP Participant's Performance During The Twenty-Four Month Project**

The payment, write-off, electrical and gas billing averages show no statistical differences between the service groups and the control group with one exception. The average total gas billing for the arrearage only group was statistically different from the control group. Control group customers were found to be as likely to pay their bills as the service group customers on average. From an economic standpoint, the write-offs gained the company no additional revenue from the service group customers by the end of the project.



## **Twenty-Four Month Delinquent Account Performance Evaluation**

In twenty-four months, one-fourth of the service group customers had no shut-off notices which was much greater than for the control group. In addition, the average number of shut-off notices for the control group was significantly higher than that for each of the three service groups. None of the differences between the service group shut-off averages and the control group's was statistically significant, however.

## **Analysis of Successful and Delinquent Account Customers**

None of the variables collected from PSCo and LEAP data bases, showing customer payment histories or energy assistance for the two year period prior to selection into CAMP, explained customer bill payment delinquency during CAMP participation. Customers who had no delinquencies, on the other hand, had lower beginning arrearage balance averages than the customers who received delinquency notices while in CAMP.

## **Cost Avoidance Analysis**

A total of 2,262 shut-off notices were avoided by the service group customers over 24 months. These 2,262 notices constitute a substantial part of the avoided collection activities attributable to CAMP. In addition, 88 service group shut-offs were avoided. Based on these collections activities, the avoided costs totaled \$79,232. The write-off for the service group customers totaled \$225,389.

## **Conclusions**

It cannot be said that arrearage forgiveness proved to be very successful in reducing unpaid balances. If anything, it must be said that the approach to arrearage forgiveness as structured and defined in this pilot project had no effect on arrearage reduction. From the customers' standpoint, the anticipated benefit of having lower utility bills, as a result of forgiven arrearages, was not realized.

Not only were there about 181 people who did not fail once during the program, there were approximately 2,300 fewer shut-off notices generated and 88 fewer shut-offs. This represents a large number of times where customers were current in their bill payments and where they were not the focus of the company's collection process. From the standpoint of delaying and reducing the number of payment failures, the project was somewhat effective.

From a cost standpoint, the write-off costs to the company were not off-set by the avoided collections costs, making the project unsuccessful financially.



## Colorado Arrearage Management Project Final Report

### Introduction

The Colorado Arrearage Management Project (CAMP) evaluation was designed to answer a number of questions about the impacts of arrearage management, weatherization and consumer credit counseling on customer payment performances. It also looked at impacts on the energy vendors' revenue stream. The two year project was modeled after several pilot projects from around the country in which a portion of each customer's outstanding arrearage was forgiven (written-off) when bills were paid each month<sup>1</sup>. In CAMP, customers paying their bills were to have one twenty-fourth of their arrearages forgiven for each payment. Payment amounts were averaged across 12 months in an average monthly bill program, based on energy bill histories. Customer payments could be made by the Low-income Energy Assistance Program (LEAP) or other heating assistance programs. Customers in the weatherization/arrearage group were offered free weatherization services with the idea that their energy costs would decrease, making it more likely that they could pay their

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<sup>1)</sup> Energy Assurance Program Pilot of the Philadelphia Gas Works and Low Income Weatherization Program of the Wisconsin Gas Company



energy bills. Weatherization services included tightness testing, heat loss mitigation, heating system testing and repair, and energy conservation training. CAMP's Weatherization component was predicated on the notion that low-income households often get behind in paying their energy bills and that by reducing these bills some positive impacts would occur. For example, customers would have lower, more affordable energy bills, fewer unpaid bills and lower arrearages. The energy company, on the other hand, would have potentially lower amounts to write-off and lower collection costs<sup>2</sup>. Consumer counseling, on the other hand, was offered by the Consumer Credit Counseling organization. Customers in the counseling/arrearage group were invited to attend three free counseling sessions and to develop budgets with the assistance of the credit counseling staff. The hypothesis was that counseled customers for whom budgets were created would be more successful in managing their money and would be more likely to pay their energy bills.

The initial expectation was that both the Greeley Gas Company and the Public Service Company would participate in CAMP. Eligibility criteria for customer participation required that an arrearage of at least \$180 per household exist and that the customer had been a Low-income Energy Assistance recipient during

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<sup>2)</sup> Quaid, M. and Pigg, S. "Measuring The Effects Of Low-Income Energy Services On Utility Customer Payments", National Consumer Law Center, Inc., Boston, Mass., Undated, Pg. 1.



the 1991-1992 energy assistance season. It also was decided that, for PSCo customers, only those living in its five metropolitan divisions would be eligible for selection into the pilot program. Upon evaluation of the Greeley Gas Company customer base, it was determined that there were insufficient numbers of customers who met the eligibility criteria to warrant its participation in the study.

### **Sample Design**

The universe of eligible PSCo customers was identified from the PSCo's customer information system. The eligible population totaled 4,737 households. A sampling design was developed in conjunction with the CAMP Committee to allow evaluation of arrearage management, weatherization/arrearage management and consumer credit counseling/arrearage management as incentives for regular customer bill payments. A control group was selected to allow statistical comparisons with the three service groups. Participants were randomly selected into each group. Public Service Company's legal department required that the selected service group customers sign written agreements with PSCo to participate in CAMP. The agreements were required in order to clearly establish that CAMP was a test program and that there were payment requirements to be met by participating customers in return for which arrearage forgiveness occurred. A contract, therefore, was created between the household and the company, stipulating the conditions under which the arrearages were forgiven.



Response to the contract by many customers was negative. Many refused to sign, resulting in the need for repeated sampling to achieve the desired service group sample sizes. During the initial sampling phases, service group customers were interviewed to determine their ability to pay the monthly bills set by the average billing process. Those who were not financially able to make the payments were rejected from the CAMP service groups. This rejection process, along with customer refusals to sign contracts, became a concern for the sampling process because a population universe larger than the 4,737 customers would have been needed to achieve the desired sample sizes. As a result, the decision was made to drop the ability to pay requirement and to select the customers directly into each group. All service group customers still were required to sign the participation contracts with PSCo. Dropping the ability to pay criterion resulted in a much smaller attrition rate and service groups large enough for analytical purposes. In all, 2,150 customers were drawn in 15 random sampling procedures from the 4,737 customer universe to fill the three service groups. Of the 2,150 people sampled, 976 signed contracts and participated in the project. An additional 196 customers were randomly sampled into the control group.

### **Evaluation Objectives**

The areas mandated in the evaluation design are as follows:

- Determine the impact of arrearage management, weatherization/arrearage forgiveness, and credit



counseling/arrearage forgiveness on individuals paying their energy bills.

- Determine the impact of weatherization on energy consumption.
- Determine the payment habits of participants in the test groups compared to those of the control group.
- Statistically compare participants in the arrearage management, weatherization/arrearage management, and consumer credit counseling/arrearage management groups with those in the control group.
- Determine the financial impact on the participating energy vendors due to arrearage management, weatherization or consumer credit counseling.

#### **Measure of Success**

The measure of success or failure, as determined by the CAMP Committee, was whether or not a shut-off delinquency notice was issued for an account. PSCo's normal decision rules governing the issuance of delinquency notices remained in place for all customers in the project, including those in the control group. All CAMP project participants benefited from several types of holds such as LEAP and medical holds. The LEAP hold is a 60 day hold on shut-offs placed on customer accounts when they qualify for and are given LEAP assistance. Medical holds, on the other hand, are holds customers can avail themselves of when termination of energy services could negatively affect a medical condition. Customers failing to make delinquent payments were subject to the normal collection processes and shut-off notices were issued.



### **CAMP Data Collection**

The CAMP project began on September 1, 1992 and ran until August 31, 1994. During the two year period, information was collected from the PSCo Customer Information System by PSCo staff. These data were reported to the evaluator on a monthly basis in four different data bases. Information about payments, write-offs, arrearage amounts, energy consumption, shut-off notices, shut-offs, address changes and pertinent dates was collected each month for each of the four groups.

Information was collected for a 24 month period on each customer. Monthly information and the corresponding dates allowed summarization of customer performances over time. Using this information, comparisons among the groups were developed addressing 1) total and average payments; 2) total and average write-offs; 3) the number of shut-off notices; and 4) cost analyses. Because receipt of the first shut-off delinquency notice designated a failure, some payment information is presented for the period between the project start up and the first notice.

### **Service Group Descriptions**

A total of 1,172 customers participated in CAMP in the four groups. Table 1 indicates the sample sizes for the four groups, the numbers of homes weatherized and the number of customers receiving consumer credit counseling. The original project



**Table 1**  
**Sample Sizes, Weatherized, And Counseled Customers**  
**For The Total CAMP Project**

Sample	Number	Weatherized	Counseled
Arrearage	348	-	-
Weatherization	310	104	-
Counseling	318	-	78
Control	196	-	-
Total	1172	104	78

intent was to have all the homes in the weatherization sample weatherized and all the customers in the counseling sample counseled. Neither of these two objectives was accomplished. Of the 310 households in the weatherization sample, 104 (33.6%) were weatherized. This was accomplished during the first project year. The decision by the CAMP Committee was made not to weatherize homes after the first year to allow the weatherization effects to be assessed over at least a one year period. Difficulty in weatherizing homes came from landlords and property owners who refused to allow the testing and modifications. Refusals were attributed to a number of reasons such as landlord fear of additional costs when ordered to bring properties into code compliance. Also, occupants were aware of the fact that they were not going to live at the address for very long and would not permit the weatherization to be done.

The proportion of customers counseled was smaller with 24.5% (78)



availing themselves of the free consumer credit counseling sessions. Each customer in this sample was supposed to attend three counseling sessions to learn how to budget his/her available dollars and to have budgets established by the Consumer Credit Counseling staff. Of the 78 customers attending the counseling sessions, only 6 (7.7%) attended all three sessions; 18 (23.1%) attended two sessions and 54 (69.2%) attended one session. Repeated attempts were made to encourage customers sampled into the counseling group to attend at least one counseling session, with little success.

As a result of the small number of weatherized homes and counseled customers, there is limited evaluation information that can be gained about these two services. The reason for this limitation is that there is concern about the differences between those customers whose homes were weatherized or those customers who availed themselves of the counseling services and those who did not. In other words, the question is what biases might exist in the information because there are real differences between those customers who took advantage of the services and those who did not. Consequently, weatherization and counseling cannot be evaluated as factors in changing bill payment or energy consumption behavior. Despite the limitations just expressed, some information can be shown comparing the two groups within the weatherization and counseling samples. This information is presented in Appendix 1.



## **Evaluation of the Sampling Process**

The first order of business is to determine whether the sampling process produced comparable groups in terms of some of the key variables. The billing history information presented below was developed from the Public Service Company Customer Information System and shows information about CAMP participants' payment histories, arrearages and consumption histories in the two years preceding selection into the project. This information was drawn from PSCo's data system in April, 1992. As shown in Table 2, with only one exception, no statistically significant differences existed between the three service groups and the control group with regard to arrearages, account balances, credit histories, and energy consumption. Account balances are the total arrearage balances plus current energy consumption amounts. Energy consumption, in Table 2, is the average total gas or electricity used during the two years preceding selection into the project. Credit history scores were calculated by adding the monthly numeric payment codes to create composite scores. In PSCo's system of payment codes, customers are assigned higher values in their credit histories when some type of delinquency arises. With regard to the credit histories, there were no statistically significant differences between either the arrearage only or the weatherization groups and the control group. The counseling and control groups were found to be different, however. The counseling group, compared to the control group, did not have as many customers each month with as many shut-off delinquency



Table 2

**Public Service Company Account History Performances  
During The Two Year Period Prior To Project Start-up  
For CAMP Participants**

	Arrear- age Only	Weatheri- zation	Counsel- ing	Control Group	Signifi- cance <sup>1</sup>
Sample Size	348	306	308	195	-
Average Arrears	\$517	\$536	\$528	\$471	None
Average Account Balance	\$644	\$664	\$655	\$597	None
Credit History <sup>2</sup>	29	28	27	29	3,4 (P<.05)
Average Electric billed	\$1,041	\$993	\$1,000	\$1,031	None
Monthly Average Electric Billed	\$43	\$41	\$42	\$43	None
Average Gas Billed	\$985	\$905	\$934	\$934	None
Monthly Average Gas Billed	\$41	\$38	\$39	\$39	None

- 1) Significance refers to the statistical significance of differences between the control group and any of the three service groups. As seen in Table 2, the only statistically significant difference found was between the counseling and the control groups for credit histories.
- 2) Credit History was computed using the PSCo payment codes assigned each month to each customer based on the payment performance. The higher the monthly code, the more negative the rating. Each customers' monthly codes were added and the averages compared, using t-tests.



notices or shut-offs. Looking at the average scores for the counseling and the control groups, the difference was not great, but it was statistically significant. As stated above, one eligibility criterion was that each client have at least \$180 in arrearages. The average arrearage in each group was much larger than \$180, ranging between \$471 for the control group and \$536 for the weatherization group. By the time the sampling process had been completed, about 13% (155) of the total project participants had reduced their arrearage balances to less than \$180. These customers were not eliminated from the project because their arrears were \$180 or greater when the sampling process began. The remaining customers had arrearages that ranged between \$180 and \$4,570.

Information showing customer LEAP assistance for the prior heating season also was collected for the project participants. This information was limited, because a relatively large number of sampled project customers were not found in the LEAP information. Approximately 40% of the CAMP participants were not identifiable in the LEAP information. Customer mobility during the warmer months resulted in new PSCo account numbers, explaining the inability to locate customers in both the PSCo and LEAP data bases. Under the Customer Information System in place during CAMP, new numbers were assigned to customers each time their addresses changed. Also, the LEAP approved applicant identified in the LEAP files frequently was not the person PSCo



held responsible for the energy bills, eliminating the possibility of visual linking of LEAP and PSCo records. The available LEAP information will be shown, because there were no apparent systematic reasons why customers were not found in the LEAP files. Further, it appeared that the same factors accounting for the missing information were at work in each sample.

**Table 3**

**LEAP Household Information Averages  
For CAMP Participants**

	Arrear- age	Weatheri- zation	Counsel- ing	Control Group	Signifi- cance <sup>1</sup>
Number	212	190	186	125	-
Family Members	3.6	3.5	3.6	3.4	None
Poverty Level	58%	61%	58%	63%	None
Monthly Income	\$590	\$610	\$570	\$616	None

- <sup>1)</sup> Significance refers to the statistical significance of differences between the control group and any of the three service groups.

No differences were found between the service groups and the control group for the size of the households, monthly income (defined as total cash received from all sources before taxes) or average poverty level (defined as the Department of Agriculture's economy food plan for various family sizes multiplied by three)



(Table 3). Although the information is not shown here, no differences were found for race, LEAP participation in the previous year, or for the type of social service program assistance the project participants received.

In summary, the available information indicates that the sampling process was successful in creating four comparable groups to test CAMP's arrearage forgiveness factor. As indicated before, only one difference between the counseling and the control group for credit history was statistically meaningful.

#### **Customer Mobility**

Previous energy assistance program evaluations have reported high mobility within low-income populations. Customer mobility in CAMP was an important factor as well. The mobility issue is being addressed if only because the weatherization component, by definition, needed customers to remain in their weatherized homes. Low-income customers move more often for a number of reasons, such as an inability to pay utility bills (forced mobility) or the need for more affordable shelter<sup>3</sup>.

CAMP customers were fairly mobile. Less than 10% did not move at least once (Table 4). The majority (57.3%) moved once. The

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<sup>3</sup>) Ibid., p. 6.



Table 4

## CAMP Customer Mobility During The 24 Month Project Period

Number of Moves	Arrearage	weatheri- zation	Counsel- ing	Control	Total
None	20 ( 5.8%)	18 ( 5.8%)	24 ( 7.5%)	25 (12.8%)	87 ( 7.4%)
One	208 (59.8%)	171 (55.2%)	175 (55.0%)	118 (60.2%)	672 (57.3%)
Two	94 (27.0%)	98 (31.6%)	102 (32.1%)	45 (23.0%)	339 (28.9%)
Three or More	26 ( 7.5%)	23 ( 7.4%)	17 ( 5.3%)	8 ( 4.1%)	74 ( 6.3%)
Total	348	310	318	196	1172

range in the number of moves was between one and five times. Of the customers who did not move, control and counseling group customers were more likely to remain in the same home. Weatherization group customers were least likely to remain in the same home.

The small number of weatherized homes and the potential of systematic biases between customers in weatherized and non-weatherized homes in the weatherization sample eliminated any possibility for statistical (parametric) analyses of weatherization as a factor in CAMP. Very high mobility among customers who initially lived in weatherized homes eliminated the presentation of even descriptive information for weatherized customers. All but one of the 104 customers living in weatherized homes moved. The mobility among customers in the



weatherization sample whose homes were weatherized (99%) was somewhat higher than was found for the customers in non-weatherized homes (91.7%).

#### **CAMP Project Participant Delinquent Account Performances**

The first objective for this evaluation was to determine the impact of arrearage management, weatherization, and credit counseling on energy bill payments, especially when compared with customers in the control group. After having signed a contract to become service group participants, equal monthly billing plans were established for each customer, based on their average monthly energy bills for the previous year. Customers in all groups were considered successful as long as they paid their monthly bills. Service group customers who failed to pay their bills were turned over to collections and worked through the normal delinquent account process. When the delinquency notice was sent, the account was defined as having failed.

The first phase of the collection process is the generation of a shut-off notice which is mailed to the customer, indicating a delinquent account. Public Utilities Commission rules define the number and types of actions, such as calls and field visits, the company must apply to allow the customers the opportunity to pay the outstanding bill amounts. The most severe company response to non-payment is disconnection of services. After the first shut-off notice was sent, CAMP continued to collect payment,



energy consumption, shut-off delinquency notice, shut-off and other information for the customer until the project's termination.

Table 5 summarizes the success and failure performances of the customers in each group. It is immediately evident that the control group did not do as well as the three service groups. After 24 months about 94% of the control group received at least one notice. Service group customers were approximately 3.5 times as successful as control group customers in paying their monthly bills regularly, albeit only about 25% did not fail in each service group. The differences between the control group and each service group were statistically significant ( $P < .01$ ), which is to say, the differences were not likely to be due to

**Table 5**  
**Total Shut-off Delinquency Notices (Failures)**  
**Over The 24 Month Period By Sample**

	<b>Arrear- age</b>	<b>Weatheri- zation</b>	<b>Counsel- ing</b>	<b>Control Group</b>	<b>Total</b>
Sample Size	348	310	318	196	1172
No Shut-off Notices	93 (26.7%)	72 (23.2%)	75 (23.6%)	12 (6.1%)	252 (21.5%)
At Least One Shut-off Notice	255 (73.3%)	238 (76.8%)	243 (76.4%)	184 (93.9%)	920 (78.5%)



chance. Consequently, it can be said that arrearage forgiveness had some success in helping customers avoid account delinquencies, at least over a 24 month period.

Figure 1 shows the cumulative percentage of shut-off notices generated each month by group. The three service groups have very similar shut-off notice distributions over the 24 month period. This point also is shown in Table 6. More control group members received delinquency notices sooner than did the services group customers. To show this fact more clearly, the cumulative percentage distributions for the control group and combined service group customers are presented in Figure 2. In this Figure, the magnitude of the differences clearly can be seen. The control group has a faster and higher rate of increase in delinquent accounts over time than do the combined service groups. CAMP's success is seen in the difference between the two curves in Figure 2. At no time in the 24 month period does the service group catch up with the control group. During each month, a higher proportion of service group customers continued to pay their bills without company resources being used in an attempt to collect delinquent accounts. In summary, the CAMP project had some positive effect on service group customers' payment behaviors and on delaying account delinquency. Because information beyond 24 months is not available, it is not known whether the service group customers will catch up to the control group in the proportion of failures to pay bills on time. The



# Shut-off Notices Over 24 Months by Sample Group

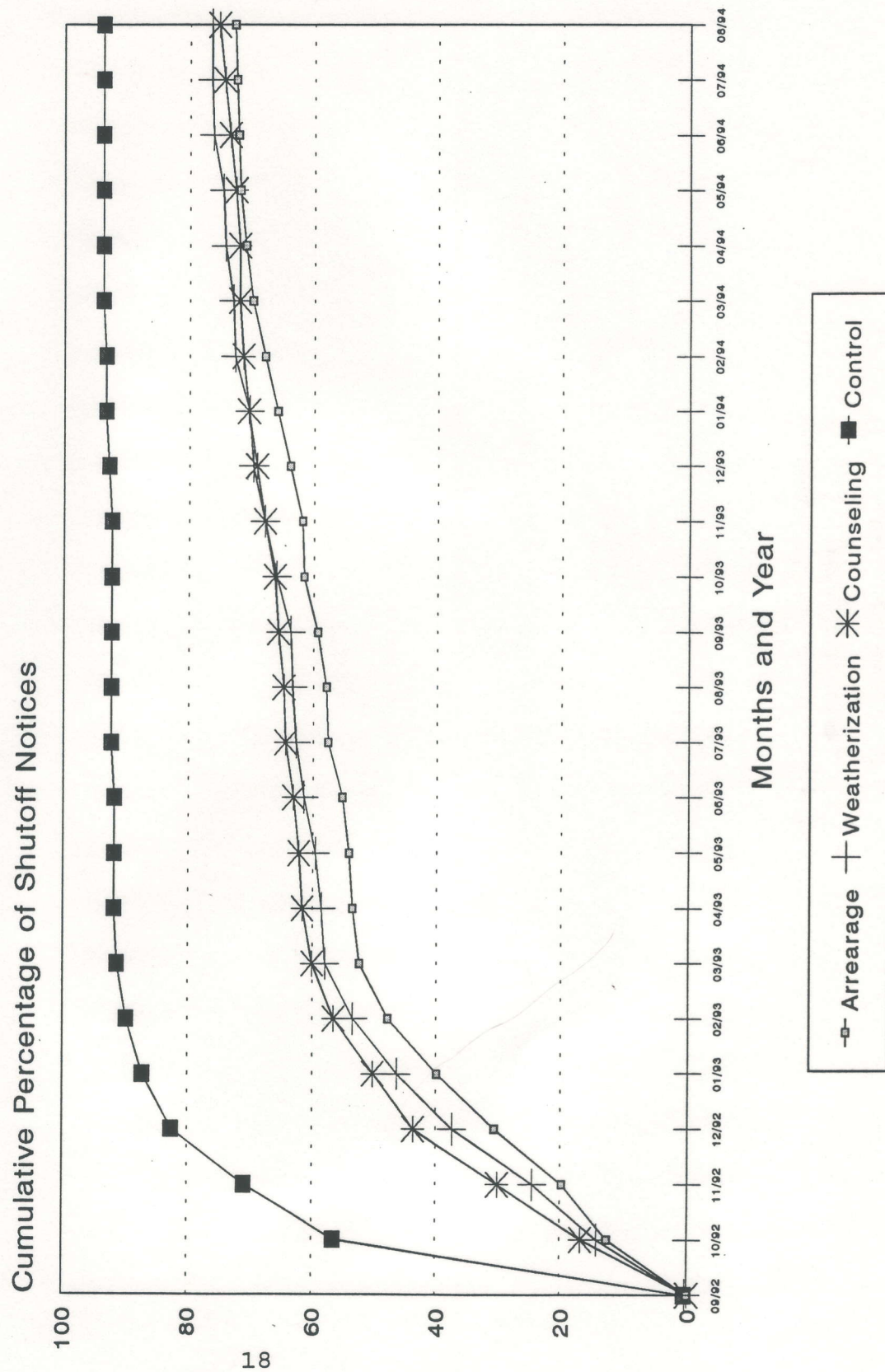




Table 6

**Monthly Shut-off Delinquency Notices (Failures)  
By Month By Group**

Month	Arrear- age	Weatheri- zation	Counsel- ing	Control Group	Total
09/92	0 ( 0.0)	1 ( 0.3)	0 ( 0.0)	1 ( 0.5)	2 ( 0.2)
10/92	44 (12.6)	43 (13.9)	53 (16.7)	110 (56.1)	250 (21.3)
11/92	25 ( 7.2)	32 (10.3)	43 (13.5)	28 (14.3)	128 (10.9)
12/92	38 (10.9)	40 (12.9)	43 (13.5)	23 (11.7)	144 (12.3)
01/93	32 ( 9.2)	28 ( 9.0)	21 ( 6.6)	9 ( 4.6)	90 ( 7.7)
02/93	28 ( 8.0)	22 ( 7.1)	20 ( 6.3)	5 ( 2.6)	75 ( 6.4)
03/93	16 ( 4.6)	14 ( 4.5)	11 ( 3.5)	3 ( 1.5)	44 ( 3.8)
04/93	4 ( 1.1)	2 ( 0.6)	5 ( 1.6)	1 ( 0.5)	12 ( 1.0)
05/93	2 ( 0.6)	3 ( 1.0)	2 ( 0.6)	0 ( 0.0)	7 ( 0.6)
06/93	4 ( 1.1)	6 ( 1.9)	3 ( 0.9)	0 ( 0.0)	13 ( 1.1)
07/93	8 ( 2.3)	4 ( 1.3)	4 ( 1.3)	1 ( 0.5)	17 ( 1.5)
08/93	1 ( 0.3)	2 ( 0.6)	4 ( 1.3)	0 ( 0.0)	7 ( 0.6)
09/93	5 ( 1.4)	1 ( 0.3)	3 ( 0.9)	0 ( 0.0)	9 ( 0.8)
10/93	8 ( 2.3)	7 ( 2.3)	2 ( 0.6)	0 ( 0.0)	17 ( 1.5)
11/93	1 ( 0.3)	6 ( 1.9)	5 ( 1.6)	0 ( 0.0)	12 ( 1.0)
12/93	7 ( 2.0)	6 ( 1.9)	4 ( 1.3)	1 ( 0.5)	18 ( 1.5)
01/94	7 ( 2.0)	2 ( 0.6)	4 ( 1.3)	1 ( 0.5)	14 ( 1.2)
02/94	7 ( 2.0)	7 ( 2.3)	3 ( 0.9)	0 ( 0.0)	17 ( 1.5)
03/94	7 ( 2.0)	1 ( 0.3)	2 ( 0.6)	1 ( 0.5)	11 ( 0.9)
04/94	4 ( 1.1)	4 ( 1.3)	0 ( 0.0)	0 ( 0.0)	8 ( 0.7)
05/94	3 ( 0.9)	1 ( 0.3)	2 ( 0.6)	0 ( 0.0)	6 ( 0.5)
06/94	1 ( 0.3)	5 ( 1.6)	3 ( 0.9)	0 ( 0.0)	9 ( 0.8)
07/94	1 ( 0.3)	1 ( 0.3)	3 ( 0.9)	0 ( 0.0)	5 ( 0.4)
08/94	1 ( 0.3)	0 ( 0.0)	3 ( 0.9)	0 ( 0.0)	4 ( 0.3)
<hr/>					
Total	255 (73.3)	238 (76.8)	243 (76.4)	184 (93.9)	920 (78.5)

positive (increasing) slope of the service group curve, seen in Figure 2, implies that this will occur, however.

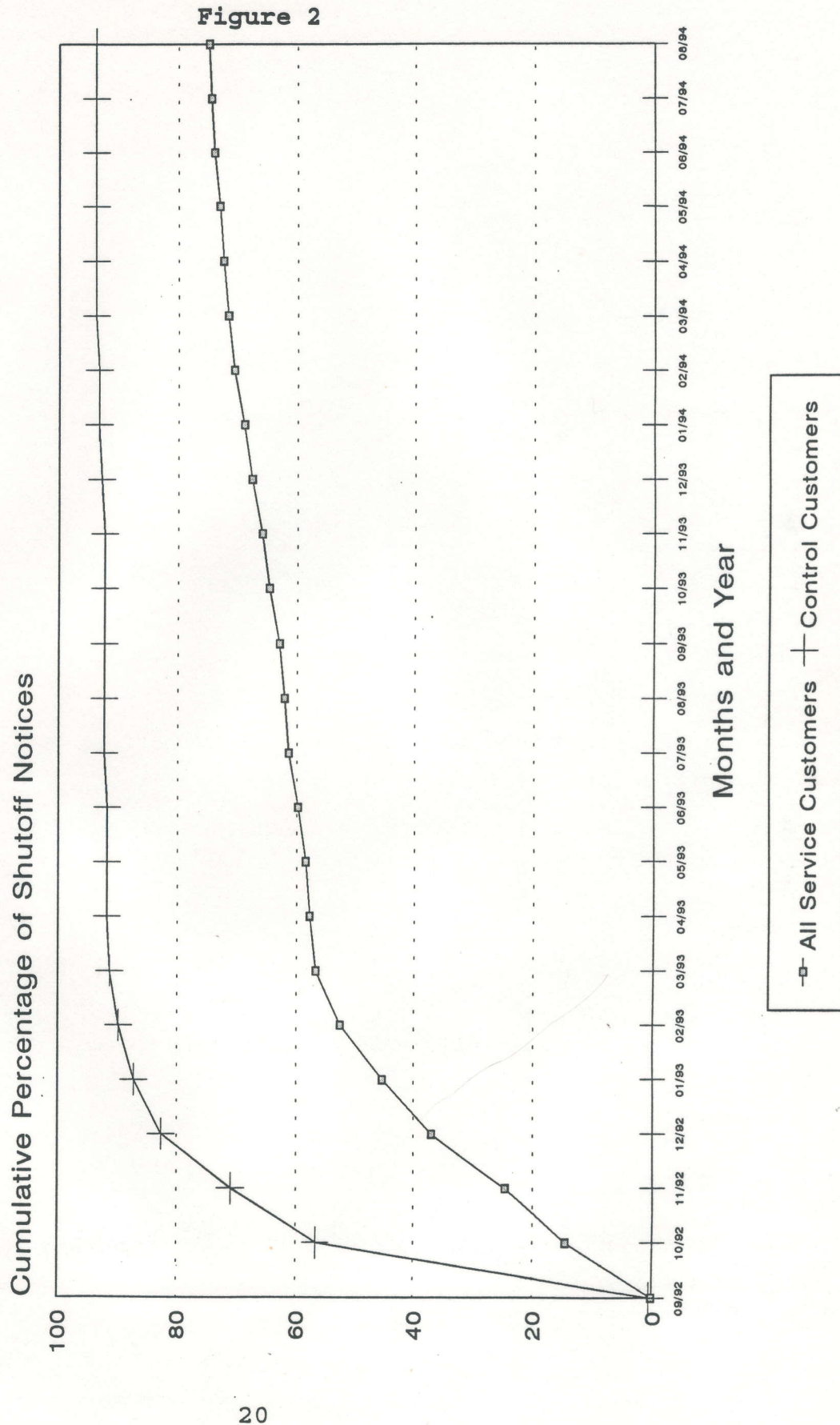
**Control Group Monthly Delinquency Notice Rates As Expectancy Rates**

The control group's monthly shut-off delinquency notice rates can be used as a baseline for assessing the service group customers' rate of failure. The baseline provides a set of expected failure rates over time. Information in Table 7 shows the cumulative



# Shut-off Notices Over 24 Months

by Total Service and Control Group Customers





shut-off delinquency notice distributions over time for the combined service groups and for the control group. It also shows the differences between the two distributions.

A number of observations can be made from the information in Table 7. First, the large majority of failures (90%) in the control group occurred in the first six months of the project with only about half of the service group failures occurring during this time period. Second, it took the service groups seven months to reach the same cumulative percentage of delinquency notices shown by the control group after two months. Third, it took the service groups 18 months to reach the same percentage of failures shown by the control group in three months. Fourth, the service groups never reached the percentage of failures shown for the control groups after 24 months. Fifth, it was not until after the third month of the project that the service groups began to close the gap between the two groups' rates of delinquency notices.

Almost 90% of the control group received at least one shut-off notice by the sixth project month. Based on this information, the value of the arrearage forgiveness program appears to be in delaying the delinquency for those receiving the forgiveness incentive. The downside of the service group performance is that, by the sixth month, half the service group customers had not paid their bills, and two-thirds had failed by the end of the



Table 7

**Cumulative Shut-off Delinquency Notices (Failures)  
By Month For Service And Control Groups**

Month	Service Groups	Control Group	Differences
09/92	0.1	0.5	0.4
10/92	14.4	56.6	42.2
11/92	24.6	70.9	46.3
12/92	37.0	82.6	45.6
01/93	45.3	87.2	41.9
02/93	52.5	89.8	37.3
03/93	56.7	91.3	34.6
04/93	57.8	91.8	34.0
05/93	58.5	91.8	33.3
06/93	59.8	91.8	32.0
07/93	61.4	92.3	30.9
08/93	62.1	92.3	30.2
09/93	63.0	92.3	29.3
10/93	64.7	92.3	27.6
11/93	65.9	92.3	26.4
12/93	67.6	92.8	25.2
01/94	68.9	93.3	24.4
02/94	70.6	93.3	22.7
03/94	71.6	93.8	22.2
04/94	72.4	93.8	21.4
05/94	73.0	93.8	20.8
06/94	73.9	93.8	19.9
07/94	74.4	93.8	19.4
08/94	74.8	93.8	19.0



first year. Thus, while the service groups show relative success compared to the control group, the majority had failed by the end of the first year.

#### **CAMP Participant Shut-Off Delinquencies**

A second measure of customer payment performance is provided by the number of shut-offs reported for the CAMP project customers. The percentage of shut-off delinquencies for the three service groups ranged between 22.1% and 26.1% as is shown in Table 8.

**Table 8**  
**CAMP Project Customer Shut-Off Performance**  
**By Group**

	<b>Arrear- age</b>	<b>Weatheri- zation</b>	<b>Counsel- ing</b>	<b>Control Group</b>	<b>Total</b>
Sample Size	348	310	318	196	1172
No Shut- offs	271 (77.9%)	241 (77.7%)	235 (73.9%)	142 (72.4%)	889 (75.9%)
Customer Shut-off	77 (22.1%)	69 (22.3%)	83 (26.1%)	54 (27.6%)	283 (24.1%)

On average, the service group customers showed a 24% rate while the control group's rate was 27.6%. The difference was not statistically significant, however. It is evident from this information that the CAMP project had little effect on the combined service group customers' likelihood of being shut-off, despite the fact that the project did have a positive effect on



their shut-off notice rate. By comparison to the general PSCo annual residential shut-off rate, between 2.4% and 3.0% of all shut-off notices result in a shut-off<sup>4</sup>. The shut-off rate for the CAMP project customers is approximately nine times higher. This is not surprising because the project focused on customers who had arrearages of at least \$180, who were low income and who were more likely to have difficulty paying energy bills consistently.

#### **CAMP Participant Account Performances Prior To The First Shut-off Notice**

Payment and consumption billing for each group are shown in Table 9, for the period between the project start up and the receipt of a shut-off notice or the end of the project, whichever came first. The 24 month period information will be shown later. In total, all customers made \$918,161 in payments, either personally, through LEAP assistance or through some other assistance agency, during this period. Service group customers accounted for \$841,721 or 91.7% of the total payments made prior to the first shut-off notice. Arrearage group customers paid the largest amounts, but this is to be expected, because there were more customers in the group. Average payment amounts, shown in Table 10, will allow for comparisons among groups. Billings for electrical and gas consumption totaled

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<sup>4</sup>) "Cost of Credit and Collections for 1992", Public Service Company of Colorado, Denver, Co., March, 1993; "The Collections Activity Review", Public Service Company of Colorado, Denver, Co., 1992, 1993, August 1994.



Table 9

Participant Payment and Use Performance Prior To The First  
Shut-off Notice For CAMP Participants

	Arrear- age	Weatheri- zation	Counsel- ing	Control Group	Total
Sample Size	348	310	318	196	1172
Total Payments	\$339,417	\$251,562	\$250,742	\$76,440	\$918,161
Total Electric Billing	\$222,962	\$169,704	\$165,991	\$47,159	\$605,816
Total Gas Billing	\$182,811	\$129,968	\$132,856	\$30,421	\$476,056

\$1,081,872. Of this amount, \$605,816 (56.0%) was for electrical use, and \$476,056 (44.0%) was for gas use. The electrical consumption billings reported for each service group ranged between 54.9% and 56.6% of the total energy bills. Their electrical billings proportionally were lower than that reported for the control group which comprised 60.8% of the total control consumption billings prior to the first shut-off notice. The difference in the average payment amounts and the utility billings seen in Table 10 for service group customers is due to the average billing process which resulted in lower payments during the winter months when most of the delinquent accounts occurred.

While the information shown in Table 9 is informative, it cannot



Table 10

**Average Total Participant Performance Prior To The First  
Shut-off Notice For CAMP Participants**

	Arrear- age	Weatheri- zation	Counsel- ing	Control Group	Signifi- cance <sup>1</sup>
Sample Size	348	310	318	196	-
Average Total Payments	\$975	\$812	\$789	\$390	All (P<.01)
Average Total Electric Billed	\$641	\$547	\$522	\$241	All (P<.01)
Average Total Electric Use	8,448	7,165	6,823	3,140	All (P<.01)
Average Total Gas Billed	\$525	\$419	\$418	\$155	All (P<.01)
Average Total Gas Use	1,345	1,046	1,041	348	All (P<.01)

<sup>1)</sup> Significance refers to the statistical significance of differences between the control group and any of the three service groups.

be used for comparative purposes due to the differences in sample sizes. Consequently, averages were calculated for payments, energy consumption billing, and energy consumption. These averages are shown in Table 10. These per customer averages are heavily influenced by the success and failure of the four groups as measured by the percentage of shut-off notices and the months in which the delinquencies occurred. The control group customers



became delinquent with their bill payment sooner than the service group customers. This is to say, the period over which payment and energy usage was collected for the control group was shorter than for the service group customers, explaining the marked difference in the payment averages and the energy usages.

One performance measure of importance, from an evaluation standpoint, is the average payment made by each customer in each group. The three service groups paid much more on average, prior to a first shut-off notice being sent, than did the customers in the control group. The three service groups ranged in average payment between \$812 and \$975 compared to \$390 shown for the control group. The differences were statistically significant ( $P < .01$ ). The service group and control group differences would be larger if the write-offs were factored in for the service groups. The fact that the control group customers became delinquent with their bill payment sooner than the service group customers explains the marked difference in the payment averages. This finding indicates the success of arrearage forgiveness in delaying shut-off notices while avoiding collection costs associated with delinquent accounts. As indicated previously, the service groups did have a lower failure rate than the control group during the project's 24 month history.

#### **Unpaid Balances At 12 and 24 Months**

An indication of the payment behavior of the service group and



control group customers is provided by the average arrearages at the beginning of the project compared to the arrearages at the end of 12 months and 24 months. The average beginning arrearages, shown in Table 11, reflect the unpaid balances reported in the first project month, not the arrearages when the customers were sampled into the project. The first and second year averages were computed using the payment, write-off and energy billing information reported monthly for each customer. Specifically, the 12 and 24 month averages were calculated by adding customers' monthly energy billing information to their beginning arrearage amounts and subtracting the monthly payment and write-off amounts for the control group and for the combined service groups. The magnitude of the control group decrease is understandable given that they were required to pay larger proportions of their unpaid balances than the service group customers who had one twenty-fourth of their arrearages forgiven if their bills were paid on time.

The important difference is seen at the end of the second year. Here, the arrearage average for the control group showed no further decrease over the first year. The service group customers, however, continued to decrease their unpaid balances. A decrease of 6.5% in the average arrearage was seen between the first and second year for the service group. This is due to the accumulation of arrearage forgiveness over time for those customers remaining eligible for the write-offs in the service



Table 11

## Beginning, One Year And Two Year Arrearage Averages

Period	Service Group	Control Group	Significance
Average Beginning Arrears	\$552	\$451	P<.05
Average Total First Year Electric Bill	\$560	\$537	None
Average Total First Year Gas Bill	\$474	\$440	None
Average Total First Year Payments	\$908	\$1010	P<.05
Average Total First Year Write-off	\$167	\$0	n/a
Average First Year Arrearages	\$511	\$418	P<.05
Average Total Second Year Electric Bill	\$457	\$450	None
Average Total Second Year Gas Bill	\$380	\$377	None
Average Total Second Year Payments	\$806	\$828	None
Average Total Second year Write-off	\$64	\$0	n/a
Average Second Year Arrearages	\$478	\$418	None



groups. The difference between the arrearage averages for the two groups of customers at 24 months was not statistically significant. By the twenty-fourth month, the service group still had not matched the percentage decrease found in the control group, but the two averages were not statistically different at this point. The expected outcome was that the service group arrearages would be significantly lower than the control group's by the project's end.

The information in Table 11 does not lend support to the notion that customers gained directly in reducing unpaid balances from the regular payment of bills among the service group customers. At the end of the first year, a significant difference still existed between the service and control customer average arrearages which were high. The difference between the two groups only decreased slightly after the first 12 months of the project. This was expected, because arrearage forgiveness accumulated at a lower rate for the service group than the arrearage pay-off of control group customers on average monthly billing plans.

The difference between the arrearages for the two groups found at the end of the first year further decreased by the end of the second year, but the service group still did not have a smaller average arrearage than the control group. In other words, the control group generally matched the arrearage decrease shown by



the service customers after 24 months of the project. By the 24th month, the control group members should have had higher average arrearage balances than the service group customers if arrearage forgiveness was to be credited with having a positive impact on payment behaviors of customers in this population.

Given that one objective of the arrearage management program was to help customers eliminate their unpaid account balances, the size of customer balances was determined (Table 12) to see how

**Table 12**

**Arrearages At 12 Months And 24 Months For Service  
And Control Group Customers**

Arrearage	Arrearage Range	Service Group	Control Group
Arrearage at 12 Months	\$0 to \$20	6.6%	12.8%
	\$21 to \$180	14.9%	23.9%
	More Than \$180	78.5%	63.3%
Arrearage at 24 Months	\$0 to \$20	15.7%	17.9%
	\$21 to \$180	16.7%	19.9%
	More Than \$180	67.6%	62.2%

well the program did in terms of this objective. Because arrearages vary from month to month, a decision was made to allow some latitude in the arrearage amounts by defining customers with arrearages of up to \$20.00 as having achieved a "zero balance". At the end of one year, a small percentage of the service customers (6.6%) had zero arrearage balances, as is shown in Table 12, but the control group had about twice that percentage



(12.8%). By the end of the second year, a little more than twice the percentage of service customers had zero arrearage balances as compared to the first year. The control group still showed a slightly higher percentage than the service group at the end of 24 months, however. The control group had a higher percentage of customers with arrearages ranging between \$21 and \$180, and it had a smaller percentage with arrearages above \$180.

Two observations can be made from the information in Table 12. First, the service customers did not do well in availing themselves of the opportunity to eliminate their arrearages through CAMP. Second, the control group did about as well as the service group in this regard. In summary, it has been shown that the large majority (84.3%) of the service group customers did not meet the objective of eliminating their unpaid balances with PSCo. In fact, the control group had a higher proportion of customers with zero balances than the service group.

A number of factors account for why the arrearages remained high. One is the mobility already shown among CAMP customers. Each time service was disconnected and reconnected after moves, deposit and service charges were assessed to the accounts. In addition, some customers were allowed to apply appliance repair costs to their accounts. Given that this population had difficulty meeting their energy consumption bills, the additional service, appliance and deposit costs further added to their



unpaid balances. PSCo has changed its policy on appliance repair payments by reviewing credit ratings before allowing such costs to be added to accounts.

**CAMP Participant's Performance During The Twenty-Four Month Project**

Based on the shut-off delinquency notice information already presented, there is some support for the effectiveness of arrearage forgiveness in assisting customers with arrearages to pay their monthly energy bills. As shown in Table 13, customer payments totalled \$2,032,705. This is considerably higher than

**Table 13**

**Total Participant Performance During The 24 Month Project Period For CAMP Participants**

	<b>Arrear- age</b>	<b>Weatheri- zation</b>	<b>Counsel- ing</b>	<b>Control Group</b>	<b>Total</b>
Sample Size	348	310	318	196	1172
Total Payments	\$613,182	\$520,106	\$539,266	\$360,151	\$2,032,705
Total Write-off	\$79,777	\$73,492	\$72,120	\$0	\$225,389
Total Electric Billing	\$364,962	\$317,111	\$310,593	\$193,503	\$1,186,169
Total Gas Billing	\$317,354	\$251,140	\$265,009	\$160,227	\$993,730



the \$918,161 reported for all the project participants during the period prior to the first shut-off notice being sent. The \$918,161 constituted 45.2% of the total payments received by the company. The comparisons between the percentages of payment amounts made prior to the first delinquency notice and the total 24 month project period revealed differences in the three service groups. For example, 55.4% of the arrearage only group's total payments to PSCo were made during the period prior to the first delinquency notice compared to 48.4% and 46.5% of the weatherization and counseling groups, respectively. The higher proportion of payments by the arrearage only group was due to the slightly lower number of these customers receiving shut-off notices and to a higher number remaining in good standing for a slightly longer period.

The control group's average payments were lower than the combined payment and write-offs made by the three service groups (Table 14). The combined average payments and write-offs for the arrearage only, weatherization and counseling groups were \$1,991, \$1,915 and \$1,923, respectively. None of these combined averages was statistically different from the control group (\$1,838). The payment and write-off averages were combined because the control group was required to pay for both energy used each month and for a portion of the unpaid balances in their arrearages. Looking only at the payments made by each group and excluding the



Table 14

**Average Participant Performance During The 24 Month Project  
Period For CAMP Participants**

	Arrear- age	Weatheri- zation	Counsel- ing	Control Group	Signifi- cance
Sample Size	348	310	318	196	1172
Average Total Payments	\$1,762	\$1,678	\$1,696	\$1,838	None
Average Total Write- off	\$229	\$237	\$227	\$0	n/a
Average Total Electric Billing	\$1,049	\$1,023	\$977	\$987	None
Average Total Gas Billing	\$912	\$810	\$833	\$818	1,4 (P<.05)

company's write-off, the service group customers made average payments of between \$1,678 and \$1,762.

In general, the service groups consumed more energy, as measured by their gas and electric billings, than the control group. The gas billing for the arrearage group was statistically different from the control group. Only the average electrical billing for the counseling group and the average gas billing for the weatherization group were lower than the corresponding control group averages.



The payment, write-off, electrical billing and gas billing averages show only one statistical difference between the arrearage only group and the control group for average total gas billing (Table 14). The statistical differences seen between the service groups and the control group for payments to the company at the time of the first shut-off notice (Table 10) disappeared by the end of the project. It appears that the advantage in average payments of the service groups over the control group existed only before the first delinquency. Customers in the service groups, on average, did no better in paying their bills than control group customers at the end of two years. Control group customers were no less likely to pay their bills than the service group. From a cost standpoint, the write-offs gained the company no additional revenue from the service group customers by the end of the project.

Looking at energy consumption over the 24 month period, the arrearage group paid about 90% of their usage compared to 91.5% and 93.7% for the weatherization and counseling groups. These percentages were below the control group's which paid 100% of their energy consumption on average. It must be noted, however, that the control group was billed to pay a higher portion of its arrearage balance and its energy consumption. This is to say, by covering only its utility service costs, the control group failed to pay its entire obligation to PSCo by not covering the unpaid balances portion in its bills. The differences between the



payment averages and the energy consumption amounts for the service group customers resulted in additional arrearages after they had received their first shut-off notices and are a function of customers in the service group having become delinquent.

#### **Twenty-Four Month Delinquent Account Performance Evaluation**

The total number of shut-off notices and shut-offs experienced by each group over the two year project period provides a different assessment of CAMP's impact on the project customers. It was implicit in the project's logic that, if customers eliminated their arrearage obligations, they had a higher probability of staying current on their monthly bill payments. Customers staying current in paying their arranged bill amounts would be less likely to become delinquent, relieving the company of collection costs. The total number of shut-off notices for each sample group over the two year period, then, is a measure of the project's success in achieving more regular payment practices.

It has been established that, of the 976 customers in the three service groups, 240 (24.6%) had no shut-off delinquency notices, compared to 12 (6.1%) for the control group. In addition, 98 (10%) customers in the service group had only one delinquency notice during the two year project, compared to 3 (1.5%) in the control group. The range in shut-off delinquent notices for the



Table 15

Average Number Of Shut-Off Delinquency Notices (Failures)  
For The Twenty-Four Month Period  
By Sample

	Arrear- age	Weatheri- zation	Counsel- ing	Control Group	Signifi- Cance
Sample Size	348	310	318	196	-
No Shut-off Notices	93 (26.7%)	72 (23.2%)	75 (23.6%)	12 (6.1%)	n/a
Average Number of Shut-off Notices	3.3	3.5	3.4	5.5	All

remaining customers was from two to 16. As is shown in Table 15, the average for the control group was significantly higher than that for each of the three service groups. Consequently, if there are any cost savings to the company, it is in the form of decreased collection costs for the service group customers. Customers experienced multiple shut-off delinquencies in a limited number of cases. While 76.5% of the combined service group customers and 72.6% of the control group were never shut-off delinquent during the project, 15.7% (153) of the service group customers had one shut-off compared to 15.3% (30) of the control customers. Multiple shut-offs were reported for 7.8% (76) of the service customers and 12.2% (24) for the control customers. The average number of shut-offs for each group is



Table 16

Average CAMP Project Customer Shut-Off Performance  
During The Two Year Project Period  
By Group

	Arrear- age	Weatheri- zation	Counsel- ing	Control Group	Signifi- cance
Sample Size	348	310	318	196	-
No Shut- offs	271 (77.9%)	241 (77.7%)	235 (73.9%)	142 (72.6%)	n/a
Average Number of Shut- offs	.31	.34	.37	.45	None

shown in Table 16. None of the differences between the service group shut-off averages and the control group's was statistically significant. The shut-off notice information will be incorporated into the cost analyses which follow.

**Analysis of Successful and Delinquent Account Customers**

Despite the fact that only 240 customers, which represent 24.5% of the three service groups, did not receive shut-off notices, there are sufficient numbers to determine who was more likely to succeed in the program. To accomplish this, factors considered to have some potential for explaining the success or failure were analyzed. Four variables were loaded into a stepwise regression model to determine their relative importance in explaining customer delinquency notices. The regression model allows



multiple variables to be added to the analysis in the process of trying to determine what variables are related to the bad debt behavior. The four variables were beginning arrearages, poverty level, income and family size. There is some interaction between poverty, income, and family size variables because they all contribute to the overall economic description of each household. This interaction was seen in the correlation information produced in the regression analyses. None of the four variables alone nor in any combination provided much explanation for customer shut-off behavior, however. Based on the regression analyses, the conclusion must be drawn that factors other than the customers' previous economic statuses accounted for the failure to pay behaviors. Other factors, such as current employment statuses and poverty levels for which there were no available data in this study, may have been more useful in accounting for the shut-off notices.

Looking at those customers who were successful, as defined by not having any shut-off notices, a series of t-tests were run to determine if they were different from those who were not successful. The four factors use in the regression analysis were used in the difference of means tests (t-tests). No differences between successful and unsuccessful customers were found for income, number of family members or poverty level. A statistical difference was found for beginning arrearage amounts. Successful customers had a much lower average beginning arrearage average



(\$474) than the customers who had at least one shut-off notice (\$608). The difference was significant at the .01 level.

This finding was contrary to an underlying assumption for the CAMP project. The assumption was that customers who owed PSCo more money in unpaid balances at the beginning of the project would be more likely to remain in good standing because they had more to gain from arrearage forgiveness. As stated previously, there was no personal history or employment information available for any customer during the project participation period. Consequently, it is not possible to determine other differences between successful and unsuccessful customers which could account for the difference in the beginning arrearages.

#### **CAMP Project Cost Analyses**

Determining the costs and benefits derived from the CAMP Project necessitates looking at these factors from two standpoints - the customers' and the company's. All the service group customers had arrearages before being selected into the project. Timely payment of monthly energy bills should have resulted in decreases in their outstanding arrearage balances and avoidance of the calls and visits from company collections staff. Elimination of their arrearage balances was expected to produce new starts with the company. From the company's perspective, regular payments meant revenue, potentially smaller arrearage balances and avoidance of collections costs. There is also a potential



Table 17

**Monthly Revenue To PSCo From Service Group Customers  
Who Did Not Receive Shut-Off Notices At Expected Rates**

Month	Difference	Number	Average Payments	Monthly Revenue
09/92	0.4	4	\$88	\$352
10/92	42.4	414	\$78	\$32,292
11/92	46.3	453	\$74	\$33,522
12/92	45.6	445	\$66	\$29,370
01/93	41.9	409	\$64	\$26,176
02/93	37.3	364	\$75	\$27,300
03/93	34.6	338	\$101	\$34,138
04/93	34.0	332	\$110	\$36,520
05/93	33.3	325	\$68	\$22,100
06/93	32.0	312	\$74	\$23,088
07/93	30.9	302	\$69	\$20,838
08/93	30.2	295	\$57	\$16,815
09/93	29.3	286	\$64	\$18,304
10/93	27.6	269	\$67	\$18,023
11/93	26.4	257	\$59	\$15,163
12/93	25.2	246	\$51	\$12,546
01/94	24.4	238	\$60	\$14,280
02/94	22.7	222	\$68	\$15,096
03/94	22.2	217	\$81	\$17,577
04/94	21.4	209	\$89	\$18,601
05/94	20.8	203	\$70	\$14,210
06/94	19.9	194	\$70	\$13,580
07/94	19.4	198	\$70	\$13,860
08/94	19.0	185	\$62	\$11,470
Total	-	6,717	\$72	\$485,221



non-revenue benefit to the company derived from a more positive corporate image, as the company endeavors to work with customers who, but for their arrearages, could maintain regular bill payments. This factor is very difficult to quantify, because it may be offset by potentially negative evaluations of stockholders.

Previously, the argument had been made that the monthly shut-off notice rates shown by the control group can be used as expectancy rates for the service groups. Table 17 builds upon the information shown in Table 7 by taking the differences between the service group shut-off percentages and those of the control group by month and using them to show the number of service customers who did not receive the "expected" shut-off notices. The average monthly payments for all project customers were determined and used to calculate the monthly revenue to the company, unencumbered by shut-off delinquency costs. Over the course of the project, \$485,221 was paid to the company by service group customers who did not become delinquent at the rate they were expected to as defined by the control group's rates. It is not implied that all these dollars would have become unpaid arrearages, but they were paid without the need for PSCo to apply any collection activity.

### **Cost Avoidance Analysis**

The analysis of the total payments made by service group and



control group clients showed that, by the end of the project, there were no differences between the groups (Table 14). CAMP service group customers did not demonstrate a payment advantage or the elimination of arrearages as expected by the project's design. Analyses were presented showing that there were differences in the average number of shut-off delinquency notices between service and control group customers, however. One benefit to PSCo derived from the CAMP program resulted from cost avoidances in not having to use the collection process to collect unpaid bills.

The cost analyses which follow are based on four data sources: 1) a study completed by the Public Service Company on collection costs; 2) Public Service Company Collection Activity Reviews; 3) on time studies of collectors both in the office and in the field; and 4) the monthly CAMP information. These sources provided standard data elements necessary for determining credit and collections expenses<sup>5</sup>. The PSCo collections study, entitled, "Cost of Credit and Collections for 1992," was completed in March, 1993<sup>6</sup>. The study took into account personnel costs for office, field and supervisory personnel; legal costs of collections; operations and maintenance costs; carrying costs for

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<sup>5</sup>) Colton, R. "Identifying Savings Arising From Low-Income Programs", National Consumer Law Center, Inc., Boston, Mass., 1993, Pg. 2.

<sup>6</sup>) Public Service Company, Op. Cit.



receivables; losses from interest on deposits held; late payment charges; reconnect fees; and energy revenues. The study was adjusted for inflation to 1993, using a 4% inflation factor developed by the company. The adjusted collection costs were calculated to be \$16,385,499 for 1993. The adjustment was made for one year rather than two, because the majority of shut-off notice activity occurred by the end of 1993.

The Collections Activity Reports were used to determine the number of notices mailed to customers, the number of phone attempts by company collectors to encourage payments (typically, first-calls), the number of field contacts (typically, second calls), and the number of shut-offs (third calls). Three separate reports from 1992, 1993 and 1994 were used to calculate monthly averages for the company collections activity<sup>7</sup>. Multiple reports were used because of the variability in the collections activity seen from month to month. Twenty-seven months of collections activity were used to improve the chances that the averages were representative of the collectors' actual workloads.

The numbers shown in Table 18 for the 27 months of workload are for all divisions in the company, not just for the Denver metropolitan region. Total company workload was used in order to conform to the "Credit and Collections Report" which reflected

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<sup>7)</sup> Public Service Company, Op. Cit.



PSCo's collections activity for all divisions. This workload information will be used to develop ratios between the first, second and third calls as part of the cost avoidance estimates. The number of project customers for whom second calls and re-checks on disconnected services were made is unknown, but the number of customers shut-off was reported by the PSCo staff. The ratios developed from the information in Table 18 will be used to estimate the number of second calls and re-checks for the CAMP service group customers.

**Table 18**  
**Collections Activity Workload Totals And Average**  
**For The Public Service Company**

<b>Workload Tasks</b>	<b>Twenty Seven Month Totals</b>	<b>Monthly Average</b>
Notices mailed	2,933,694	108,655
First Calls	389,579	14,429
Second Calls	268,243	9,935
Third Calls	77,953	2,887
Return Checks	11,958	443
Phone Calls	725,537	26,872

Time studies of collectors' activities were conducted to determine how much time was required by the various tasks, such as phoning customers (phone power), reviewing customer printouts, reviewing customer records on the Customer Information System



(tube time), contacting customers in the field, removing meters, or re-checking disconnected services. Each task was timed and recorded with annotations indicating the type of task and the outcome. For example, if the collector made phone calls to customers, the time taken on the call was noted as were comments about whether the collector did or did not speak to someone. The time taken to enter comments onto customer computer records also was noted. Three different sessions with collectors were necessary to collect sufficient numbers of observations on which to base the calculation of average times for each task. These calculations are taken as general approximations even though the three sessions were held with three different collectors. This is because the collection activity only covered the Denver region. Consequently, no representation can be made that the estimates reflect the collection activity for all company collectors. Despite this limitation, the estimates are useful, because they allow the determination of weighting factors needed to distribute collection dollars across the various tasks and activities making up the collections process. This is a significant point because the time study conducted for the CAMP study only can be generalized to the Denver region and does not necessarily correspond to cost analyses developed by PSCo for other purposes.

The evaluations in the field and the time spent in the office with collectors revealed that the phone calls and checking of



accounts on the company data system averaged 2.4 minutes, while field visits to customers averaged 5.5 minutes and third calls and re-checks averaged 15 minutes including driving time. Using these time factors and the collection activity information from Table 23, an algorithm was developed to determine a cost factor for collections services:

First Calls	=	2.4c(389,579)	=	934,990c
Second Calls	=	5.5c(268,243)	=	1,475,337c
Third Calls	=	15.0c(77,953)	=	1,169,295c
Fourth Calls	=	15.0c(11,958)	=	<u>179,370c</u>
				3,758,992c = \$16,385,498
				c = \$4.36

Where c = the cost per minute of collection service

As shown in Table 15, the three service groups were comparable in terms of the percentage of customers not receiving shut-off notices during the two year project. Consequently, the three groups again will be combined into one service group when calculating the collections costs. As stated previously, the combined service group had 240 (24.6%) customers who did not receive shut-off notices. This compares to 12 (6.1%) for the control group. It is the difference in these two percentages that represents the cost savings (avoidances) to the company.



Table 19

**Shut-Off Delinquency Notices For Service  
And Control Group Customers Over  
The Twenty-Four Month Project**

Number of Shut-off Notices	Service Group	Control Group	Difference	Number of Notices Avoided <sup>1</sup>
None	240 (24.6%)	12 ( 6.1%)	18.5%	181
1	98 (10.0%)	3 ( 1.5%)	( 8.5%)	(83)
2	109 (11.2%)	14 ( 7.1%)	( 4.1%)	(80)
3	123 (12.6%)	26 (13.3%)	0.7%	21
4	103 (10.6%)	23 (11.7%)	1.1%	44
5	68 ( 7.0%)	23 (11.7%)	4.7%	230
6	64 ( 6.6%)	25 (12.8%)	6.2%	366
7	60 ( 6.1%)	27 (13.8%)	7.7%	525
8	36 ( 3.7%)	12 ( 6.1%)	2.4%	184
9	34 ( 3.5%)	10 ( 5.1%)	1.6%	144
10	14 ( 1.4%)	6 ( 3.1%)	1.7%	170
11	11 ( 1.1%)	8 ( 4.1%)	3.0%	319
12	8 ( 0.8%)	3 ( 1.0%)	0.2%	24
13	4 ( 0.3%)	2 ( 1.0%)	0.7%	91
14	3 ( 0.1%)	0 ( 0.0%)	(0.1%)	14
15	1 ( 0.1%)	1 ( 0.5%)	0.4%	60
16	0 ( 0.0%)	1 ( 0.5%)	0.5%	80
Total	976	196	36.7%	2,262

<sup>1</sup> Shut-off notice avoidance was calculated by multiplying the total number of service group customers by the percentages in the difference column and multiplying the resulting product by the number of shut-off notices



Using this difference, collections costs for 181 customers were avoided over the course of the project. In addition, there were costs avoided for the smaller number of total shut-off notices among the service customers.

The total number of avoided shut-off notices are shown in Table 19 where the control group's notices again are used as a benchmark of those expected for service group customers. Where the control group had higher percentages of shut-off notices, the differences were taken and shown as positive numbers. The only exception to this was in the case where the number of customers without notices was calculated. Here, the higher percentage of service group customers was taken as a positive. Negative numbers were shown where the service group had higher percentages of shut-off notices. The resulting total of 2,262 is the expected number of shut-off notices the service group customers would have had if they failed at the same rate as the control group customers. These 2,262 notices are the avoided collection activities attributable to CAMP. The 2,262 avoided shut-off notices provides a monthly average of 94 avoided notices and a 2.3 average per service group customer.

The second set of avoided costs accrues from the lower number of shut-offs experienced by the service group customers. Applying the same logic used in the calculation of the cost avoided through lower numbers of shut-off notices, 88 service group shut-



offs, predicted by the control group rates, were avoided. As shown in Table 20, the number of shut-offs for all customers ranged between one and five. The control group's average was .45 shut-offs compared to .34 for the service group, clearly indicating how infrequently shut-offs occur. The average avoided shut-offs per month was 3.6.

**Table 20**

**Shut-Off Delinquencies For Service  
And Control Group Customers Over  
The Twenty-Four Month Project**

Number of Shut-offs	Service Group	Control Group	Difference	Number of Shut-offs Avoided <sup>1</sup>
None	747 (76.5%)	142 (72.4%)	4.1%	40
1	153 (15.7%)	30 (15.3%)	(0.4%)	( 4)
2	57 ( 5.8%)	16 ( 8.2%)	2.4%	23
3	13 ( 1.3%)	7 ( 3.6%)	2.3%	22
4	4 ( 0.4%)	0 ( 0.0%)	(0.4%)	4
5	2 ( 0.2%)	1 ( 0.5%)	0.3%	3
Total	976	196	6.8%	88

<sup>1</sup> Shut-off avoidance was calculated by multiplying the total number of service group customers by the percentages in the difference column and multiplying the resulting product by the number of shut-offs.



Because information was not available for the CAMP participants, showing all types of collection activities expended on each delinquent customer in the project by collectors, the ratios between first and second calls and between third calls and re-checks were applied to the shut-off notice and shut-off delinquent information shown in Tables 19 and 20. The ratio information (Table 21) was derived from the Collection Report

**Table 21**

**Proportion Of Second Calls, Third Calls And Returns  
As Functions Of The Number Of First Calls**

Relationship (Ratio)	Percent
First Call to Notices Mailed	13%
Second Calls to First Calls	69%
Third Calls to Second Calls	29%
Return Checks to Third Calls	15%
Phone Calls to Mailed Notices	25%

information, as presented previously. The calculated number of expected shut-offs (88) is used rather than projecting a number based on the ratio from the collection activity reports. This does not skew the cost analyses, because the ratio of shut-offs to shut-off notices for CAMP (4.0%) is very close to that calculated using the Collection Activity Report information



(3.0%)<sup>8</sup>.

Having developed the cost per minute of collections services, the necessary ratios for collections activities and the number of avoided notices and shut-offs, the total avoided costs for the 24

**Table 22**

**Cost Avoidance Analysis For Service Customers  
For Shut-Off Notice And Shut-Off  
Collections Activity**

Collection Activity	Weighting Factor	Number of Customers	Cost per Activity	Total Costs
First Calls	n/a	2,262	\$10.46	\$23,661
Second Calls	69%	1,561	\$28.98	\$45,238
Third Calls	n/a	88	\$65.40	\$5,755
Re-checks	15%	70	\$65.40	\$4,578
Total	-	-	-	\$79,232

month project for the service group customers was calculated to total \$79,232. The calculations supporting this total are shown in Table 22. The analysis in Table 22 is based on two assumptions:

1. All the customers who received shut-off notices received first calls from collectors. This assumption was predicated on the fact that all CAMP participants had arrearages of at least \$180 when starting the project.

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<sup>8)</sup> Public Service Company, Op. Cit.



2. The ratio of second calls to first calls (69%) and of re-checks to third calls (15%) found in the Collection Reports held true for the CAMP customers.

Without making the first assumption, the avoided costs would have been lower. For example, the ratio of first calls to notices mailed, shown in Table 21, is 13%. It is not unreasonable to make assumption #1 given the large arrearages held by CAMP participants which generally remained high for these customers. In summary, the write-off for the service group customers totaled \$225,389. This cost to the company was offset by the avoided collections costs of \$79,232. The avoided costs needed to be much higher for PSCo to argue CAMP's economic viability to the Public Utilities Commission, legislature, or the public.



## Conclusions

The CAMP evaluation has been totally statistical in nature to this point because that is the way evaluations generally are done. However, the conclusions drawn from these data cannot be in terms of only the average payments customers made or the statistical significance in differences found in shut-off delinquency notices. The conclusions must take into account the customers who participated in the project and PSCo which agreed to do the test project.

When CAMP began, there were high expectations that customers in the service groups would successfully reduce their arrearages to the point they could pay their utility bills without again becoming delinquent or having to face shut-offs. The assumption was that the additional unpaid balances were burdens on these customers who, but for the arrearages, would pay their bills regularly. The zero balance objective was not achieved to the degree it was hoped. There was a percentage (15.7%) of the customers who did have zero balances when the project ended, but the control group had a slightly higher percentage (17.9%). As a result, it cannot be said that arrearage forgiveness proved very successful in reducing unpaid balances. If anything, it must be said that the arrearage forgiveness had no effect on arrearage reduction. From the customers' standpoint, the anticipated benefit of having lower utility bills which were affordable was not realized. Factors were at play, such as service charges and



deposits associated with moving from one address to another which were not accounted for in the project's design. Average payments were based on billing histories which only partially accounted for the costs generated by the customers. A similar statement can be made for failing to take into account other charges to customer accounts, such as appliance repairs. This was an inadvertent omission in the project's design.

The difficulty in making the observation that other costs should have been taken into account is that the solutions to the problem may not be viable. For example, customers' average bills could have taken the additional costs into account. The difficulty with this is that the customers probably could not afford to make the higher payments that would have resulted. LEAP assistance, for example, is based on energy costs, meaning a deficit, created by these other costs, would have existed. A second alternative would have been for PSCo to forgo required deposits or applying service charges. This may not be legal, given the prohibition of passing such costs on to rate payers in Colorado. It is clear that CAMP, as it was structured, was ineffective in helping customers eliminate their substantial arrearages or in reducing them significantly in comparison to those customers who did not receive the same financial considerations as the service group customers. The service group customers remained as burdened as the control group customers with unpaid balances at the end of the project.



A second conclusion, relevant to the service group customers, was that a significantly large number did not fail in the program by getting shut-off notices. Approximately 18% of the service group customers did not receive a shut-off notice as expected. This is a meaningful difference compared to the control group. Not only were there about 181 people who did not fail once during the program as the control group's baseline rate predicted they would, there were approximately 2,300 fewer shut-off notices generated and 88 fewer shut-off than were expected. This represents a large number of times where customers were current in their bill payments and they were not the focus of the company's collection process. This is positive for both the service group customers and PSCo. From the standpoint of delaying and reducing the number of payment failures, the project was somewhat effective. Where the project failed was in its ability to sustain these positive effects over time. The downside to this is that the large majority of the customers in the service group failed (about 74% after two years) and about two-thirds failed after one year. For the customer in the service groups, the majority experienced no net effect from CAMP in avoiding completely the company's collection efforts because a payment delinquency occurred.

An objective evaluation of the reductions in failures is difficult at this point because there was no benchmark established by which to gauge the finding. It would have been



more precise to have established an expectancy objective for avoided shut-off notices or shut-offs. This is the evaluator's error, because ample opportunity was given prior to the project's start to develop such an objective. What is left is a much less precise judgement, and one which can be the subject of much discussion, that if at least half the service group customers had had no failures, the project's performance with regards to the bill payments could have been judged successful more easily. Clearly, the control group was much less successful, but given the service group's very high failure rate, it is difficult to attribute the project's success to about a 20% marginal success rate.

These previous conclusions were primarily focused on the limited benefit for the service customers. PSCo did experience a substantial dollar loss in the project because there were insufficient off-sets to the arrearage write-offs (\$225,389). The avoided costs (\$79,232) were considerably less than the bad debt created by the forgiveness. Had the avoided costs approached those written-off, a defensible argument could be made that CAMP was financially justifiable. In that the economic costs and benefits needed to approach zero, it is not possible to attribute success to CAMP from a financial standpoint.



## Appendix

### Weatherization And Counseling Group Account Performances

Analysis of the address changes reported in the PSCo customer information data base revealed that mobility was frequent in the weatherization sample, as it was for the other samples. All but one customer living in the weatherized homes moved. The weatherized customers moved more frequently (99.0%) than the customers in homes not weatherized (91.7%). Because the mobility was so high, no effects of the weatherization program can be determined. Some descriptive information is presented, but no evaluation of weatherization as a factor in CAMP is possible.

Counseling group customers did not participate in the counseling session to any great degree either. Customers who attended counseling sessions also may have been different from those who did not, limiting the type of information that can be presented for the counseling group. Counseled customers made higher average payments and used more energy than the customers who were not counseled in the counseling sample. The expectation was not that counseled customers would be more energy efficient, but that they would manage their money more effectively and pay their energy bills. As shown in Table A-1, this expectation was borne out. The counseled customers were less likely to have shut-off notices. Of the 78 counseled customers, 32.1% did not receive



Table A-1

**Weatherization and Counseling Sample  
Shut-Off Notices**

	Not Weatherized	Weatherized	Not Counseled	Counseled
Number	206	104	240	78
No Shut-off Notices	37 (18.0%)	35 (33.7%)	50 (20.8%)	25 (32.1%)
At Least One Shut-off Notice	169 (82.0%)	69 (66.7%)	190 (79.2%)	53 (68.9%)

shut-off notices compared to 20.8% of the customers who were not counseled.

A more detailed analysis of the customers receiving two and three counseling sessions showed that they received fewer shut-off notices proportionally than those who received only one session (Table A-2). While 29.6% of the customers receiving one session had no shut-off notices, 33.3% and 50.0% of those receiving two and three sessions, respectively, had no notices. It was not the intent of the project to test whether the number of counseling sessions was related to customer success in paying their monthly bills. This became possible when customers refused to attend all three sessions. It must be remembered that no assumption can be made about the causality between the number of counseling



Table A-2

**Consumer Counseling Sessions And Customer  
Shut-Off Notices By Number Of Counseling Sessions**

	Not Counseled	One Session	Two Sessions	Three Sessions
Number	240	54	18	6
No Shut-off Notices	50 (20.8%)	16 (29.6%)	6 (33.3%)	3 (50.0%)
At Least One Shut-off Notice	190 (79.2%)	38 (70.4%)	12 (66.7%)	3 (50.0%)

sessions and the decrease in shut-off notices. Perhaps those people attending the three counseling sessions had different attitudes or abilities to pay their bills, accounting for the differences in the percentage of notices. What can be said is that the relationship between the increased number of counseling sessions and the smaller number of shut-off notices is in the right direction. A similar relationship was found for the number of shut-offs reported for the three counseled groups. Seventy (29.2%) of the customers not attending counseling were shut-off, compared to 12 (22.2%), 1 (5.6%), and 0 of the customers having one, two, and three sessions respectively.

The weatherized households tended not to have as many shut-off delinquency notices as those not weatherized. About one-third of the weatherized households did not receive shut-off notices



compared to 18.0% of the households not weatherized (Table A-1). This relationship held for shut-offs as well with about 84% of the weatherized households not being shut-off compared to 75% of those who were not weatherized. This observation in the differences between the weatherized and the non-weatherized households supports the concern that the two groups were otherwise different, because weatherization as a factor was eliminated when all but one customer in the weatherized homes moved.