

Docket No. 05-057-T01  
DPU Exhibit No. 1.0R (AP-A)  
Dr. Artie Powell  
August 8, 2007

-BEFORE THE PUBLIC SERVICE COMMISSION OF UTAH-

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IN THE MATTER OF THE JOINT	)	
APPLICATION OF QUESTAR GAS	)	
COMPANY, THE DIVISION OF PUBLIC	)	
UTILITIES, AND UTAH CLEAN ENERGY	)	
FOR THE APPROVAL OF THE	)	DOCKET No. 05-057-T01
CONSERVATION ENABLING TARIFF	)	
ADJUSTMENT OPTION AND ACCOUNTING	)	
ORDERS	)	

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REBUTTAL TESTIMONY OF

ARTIE POWELL

FOR THE

DIVISION OF PUBLIC UTILITIES

DEPARTMENT OF COMMERCE

STATE OF UTAH

August 8, 2007

1 **Q: Please state your name, employer, and position for the record.**

2 A: My name is Dr. Artie Powell, I am employed by the Division of Public Utilities as  
3 the manager of the energy section.

4 **Q: What is the purpose of your rebuttal testimony?**

5 A: In testimony filed on behalf of the Committee of Consumer Services (CCS), Dr.  
6 David E. Dismukes raises concerns with the CET pilot program and makes  
7 several recommendations including adoption of a “lost revenue adjustment  
8 (“LRA”) mechanism to make the company whole for changes in usage resulting  
9 from DSM programs.”<sup>1</sup> My rebuttal testimony attempts to refute part of the basis  
10 for this recommendation and addresses a few concerns about the calculation or  
11 estimation of lost revenues.

12 Specifically, Dr. Dismukes’ recommendation of the adoption of a LRA  
13 mechanism is in part based on two arguments. First, that there is a close  
14 relationship between cost-effectiveness studies used to implement DSM programs  
15 and the calculation of avoided costs. Second, increased monitoring and  
16 verification may mitigate or eliminate difficulties with calculating lost revenues  
17 associated with DSM programs. I argue that Dr. Dismukes’ characterization of the  
18 relationship is oversimplified and that no amount of increased monitoring will  
19 eliminate some fundamental concerns or difficulties with the calculation of lost  
20 revenues.

21 **Q: Would you please summarize your conclusions and recommendations?**

22 A: Given the fact that the Committee has failed to specify any details as to how its  
23 LRA mechanism would work, I recommend that the Commission reject the  
24 Committee’s recommendations in this proceeding and continue with the CET as  
25 modified by Division testimony.

26 **Q: What recommendations does Dr. Dismukes make on behalf of the**  
27 **Committee?**

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<sup>1</sup> David E. Dismukes, Direct Testimony On Behalf of the Committee of Consumer Services, Docket 05-057-T01, June 1, 2007, p. 6.

28 A: Dr. Dismukes makes three primary recommendations which can be summarized  
29 as (1) discontinue the CET pilot, (2) adopt a LRA mechanism, and (3) direct the  
30 Company to address any additional financial concerns in a general rate case using  
31 an appropriately defined test year. Additionally, in the case where the  
32 Commission decides to move forward with the CET, Dr. Dismukes offers several  
33 alternative recommendations or modifications to the CET. Namely, (1) base  
34 decoupling “true-ups” on the test year level number of customers instead of the  
35 then current actual customer count, (2) explicitly recognize the (alleged) risk  
36 shifting nature of the CET, and (3) indicate that the risk shifting will be  
37 considered when setting the allowed rate of return in the next general rate case.<sup>2</sup>

38 **Q: Does the Division support any of these recommendations?**

39 A: The Division in part supports the third alternative recommendation; however this  
40 proceeding plays out, the Division will certainly consider that outcome in its  
41 recommendation for an allowed rate of return in the next general rate case.

42 However, I would offer two cautions. First, the Committee has failed to  
43 produce persuasive evidence that the CET or decoupling in general will shift risk  
44 between the Company and its customers. Specifically, based on the Committee’s  
45 arguments, the Division is not convinced that the CET will necessarily decrease  
46 Questar’s business risk that financial markets would acknowledge, which would  
47 justify a lower rate of return. (Division witness, Dr. Daniel G. Hansen, addresses  
48 the issues of risk shifting in both direct and rebuttal testimony). Second, risk is  
49 not a single dimensional issue and, thus, the Division’s evaluation and return  
50 recommendation will be done in the context of the Company’s overall risk profile.

51 Division witnesses also dispute the basis provided by the Committee for  
52 the other recommendations and, therefore, the Division recommends against their  
53 adoption. Specifically, Dr. Hansen addresses concerns about the Committee’s  
54 first and third primary recommendations and many related issues raised in Dr.  
55 Dismukes’ testimony as well as the alternative recommendations. Both Dr.

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<sup>2</sup> Dr. Dismukes testimony combines the second and third alternative recommendations as one; I have broken them out for convenience.

56 Hansen and I address the second primary recommendation, the adoption of a LRA  
57 mechanism. Again, my remarks deal with the implementation of a LRA  
58 mechanism; Dr. Hansen addresses some incentive issues left unresolved by the  
59 adoption of a LRA mechanism.

60 **Q: Can you summarize your concerns with the adoption of a LRA mechanism?**

61 A: My concerns have to do with the calculation or estimation of the actual lost  
62 revenues associated with the Company's DSM programs.

63 Beginning at line 910 of his testimony, Dr. Dismukes describes in general  
64 terms the use of a LRA mechanism to compensate the Company for any lost  
65 revenues due to the decline in usage associated with DSM programs. At line 916,  
66 Dr. Dismukes states, "Under this approach, a utility's ability to recover lost  
67 revenues is based upon *actual* savings which result from its DSM programs".<sup>3</sup>

68 Beginning at line 956, he defines lost revenues as, "[S]imply the product  
69 of average utility base rates and the *actual* savings attained by the DSM  
70 program".<sup>4</sup>

71 Finally, beginning at line 974, Dr. Dismukes states, "The argument that  
72 lost revenues are difficult to measure is somewhat incompatible with cost-  
73 effectiveness findings upon which DSM program approvals are usually based.  
74 The implication is that regulatory approval of proposed DSM programs cannot be  
75 based upon any accurate level of savings leaving a potentially large amount of  
76 unsupported costs to be recovered in rates".<sup>5</sup>

77 While I agree with Dr. Dismukes that lost revenues are related to cost-  
78 effectiveness, Dr. Dismukes characterization of that relationship is a gross over-  
79 simplification.

80 **Q: How would you characterize Dr. Dismukes idea of the relationship between**  
81 **lost revenues and cost-effectiveness tests or studies?**

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<sup>3</sup> Dismukes, lines 916-918, p. 41 (emphasis added).

<sup>4</sup> Dismukes, lines 956-957, p. 43 (emphasis added).

<sup>5</sup> Dismukes, lines 974-979, p. 44.

82 A: I believe Dr. Dismukes' characterization implies a near one-to-one relationship  
83 between the lost revenues associated with DSM programs and the cost-  
84 effectiveness or benefit-cost studies undertaken to approve the implementation of  
85 those programs. In other words, I believe that Dr. Dismukes' discussion tends to  
86 leave the impression that calculation of actual lost revenues is a simple extension  
87 of the benefit-cost analysis. This over-simplification is like describing a trip to  
88 the moon as just a long flight – measuring or estimating the actual lost revenues  
89 attributable to a particular DSM program will be controversial and difficult.

90 **Q: How would you characterize the relationship between lost revenues and cost-**  
91 **effectiveness studies?**

92 A: Once the benefit-cost studies are completed and the programs are approved for  
93 implementation, the task of measuring and attributing lost revenues to the  
94 program begins.

95 In this regard, it is not clear from Dr. Dismukes testimony what he means  
96 by “actual” savings. I can think of at least two ways actual savings could be  
97 determined. First, actual savings may be defined using the engineering estimates  
98 of potential savings from the benefit-cost analysis adjusted for actual participation  
99 levels. Because this approach assumes that the full potential savings or reduction  
100 in usage is achieved by each participant, the resulting lost revenue calculations  
101 would not seem very reliable. For example, a customer may install a low-flow  
102 showerhead but wind up taking longer showers, thus, achieving no real savings.

103 Second, regression analysis could isolate the effects of the DSM program  
104 on usage from other causes. These isolated effects, or the portion of the total  
105 change in usage attributable to the DSM program, would define the actual savings  
106 used in the lost revenue calculation.

107 **Q: Could you explain what you mean by “isolated” or “attributable”?**

108 A: Usage can change for a variety of reasons or variables. The effects of the DSM  
109 program on usage will have to be isolated from the effects these other variables

110 have on usage before the lost revenues can be calculated and assigned with any  
111 degree of certainty to the DSM program.

112 For example, weather can affect usage patterns. In colder than normal  
113 winters, everything else being the same, customers will tend to use more natural  
114 gas in heating their homes; in warmer than normal winters they will tend to use  
115 less. In calculating the lost revenues associated with the DSM program the effects  
116 weather have on usage will have to be first separated out or accounted for.

117 **Q: Are there ways to account for the effects that these other variables will have**  
118 **on usage?**

119 A: Yes. Again using weather as an example, there are at least two ways to separate  
120 the effects of weather from the effects of the DSM programs. The lost revenue  
121 calculation could use weather normalized usage data or a weather variable could  
122 be defined in the context of a regression model. Once the change in actual usage  
123 attributable to the DSM program is isolated from the weather effects, it can be  
124 used in the calculation of the lost revenue attributable to the DSM program.

125 **Q: Could Questar's weather normalization mechanism be used in the way you**  
126 **describe to attribute lost revenues to the DSM programs?**

127 A: Perhaps, but that would have to be determined by the Commission. Remember,  
128 Questar's weather normalization mechanism has been approved for ratemaking  
129 purposes. Whether the mechanism is appropriate for the purpose of calculating  
130 lost revenues has not been determined by the Commission. It may turn out,  
131 however, that the interaction of Questar's weather normalization mechanism and  
132 the DSM programs leads to a systematic over or under estimation in the change in  
133 usage or lost revenues. In other words, the weather normalization mechanism  
134 may lead to unreliable results in terms of calculating lost revenues.

135 Additionally, weather is only one of several variables that potentially  
136 influence usage patterns. Other potential variables include the price or tariff for  
137 natural gas, and a variety of demographic and macro-economic variables. A  
138 regression model using all such variables potentially could be used to isolate the

139 effects on usage attributable to the DSM programs. Of course, constructing such  
140 a model is more difficult than it sounds.

141 **Q: Please explain the difficulties involved in specifying such a model.**

142 A: The difficulties can be grouped into three categories: (1) specification of the  
143 model, (2) measurement of the variables, and (3) interpretation of the results.  
144 Additionally, depending on how each of the difficulties is resolved, a number of  
145 potential statistical and practical problems will require addressing.

146 First, there are at least two difficulties with specification of the model: (1)  
147 which variables are to be included in the model and (2) what form each variable  
148 should take in the model. A regression model is designed to explain the variation,  
149 or at least a considerable proportion of the variation, in a dependent variable.  
150 Ideally, the variables chosen to explain the variation, the independent variables,  
151 are chosen based on sound theory. For purposes of calculating lost revenues, we  
152 want to explain the variation in usage, so usage will be the dependent variable in  
153 the regression model. The other variables I mentioned above will form the set of  
154 independent variables.

155 Again, ideally, which variables are included in the model and how each  
156 variable is measured would be determined in advance of any data analysis.  
157 Unfortunately, there is no definitive theory to tell us which variables should be in  
158 the model. And, since each stakeholder will have different incentives and  
159 experiences, choosing a set of independent variables is likely to be the first  
160 obstacle in specifying the regression model.

161 In addition to deciding which variables are included, the form each  
162 variable takes in the model must be specified. For example, variables can enter  
163 the model in either base 10 numerology or in log form. Some form choices may  
164 not be obvious until after some preliminary data analysis or even after the first  
165 regression results are analyzed.

166 The second difficulty is determining the units of measurement for each  
167 variable. For example, macro-economic variables are measured in monthly,

168 quarterly, and annual units. If quarterly data is chosen, then do we need to  
169 include in the regression indicator variables that would account for the seasonal  
170 variation in usage or should we include variables that account for the interaction  
171 between independent variables.<sup>6</sup>

172 Third, since each stakeholder has different motivations, the interpretation  
173 of the results is almost guaranteed to be controversial. For example, a stakeholder  
174 may not like the results of the regression analysis and argue that the problem lies  
175 not with the DSM program but is in the specification of the model, the  
176 measurement of one or more of the regression variables, or the way in which one  
177 or more statistical or practical problems were addressed. Additionally,  
178 interpretation problems may arise over the presence or absence of one or more  
179 statistical problems.

180 For example, the presence of autocorrelation in the estimated error terms  
181 of the model may yield biased regression results, which from a practical point of  
182 view means the reliability of the regression results is questionable – the results  
183 cannot be used to determine the lost revenues associated with the DSM programs.  
184 Other potential statistical or practical problems include heteroskedasticity and  
185 multicollinearity.

186 **Q: Are there other problems or difficulties in the adoption of a LRA**  
187 **mechanism.**

188 A: Yes. Other issues may become apparent once the Committee formulates a  
189 specific LRA mechanism or, in response to a Commission order, stakeholders  
190 convene discussions to evaluate alternative proposals. Instead of elaborating on  
191 these issues at this point, I have attached a report prepared for PacifiCorp by  
192 Barakat & Chamberlin (September 13, 1996) evaluating one of PacifiCorp's DSM  
193 programs. While this report appears not to contain a lost revenue calculation, it  
194 does illustrate the type of analysis that would lead to the isolation of the effects of  
195 the DSM program on usage necessary for a lost revenue calculation. The report  
196 highlights several additional issues including (1) sample design and size, (2) data

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<sup>6</sup> These two examples illustrate the fact that the difficulties may be dependent on each other.



197 collection and site visits, (3) data cleaning and normalization, estimation of  
198 annual savings, and (4) extrapolation of findings to the program. (See pages 2 –  
199 20).

200 Additionally, a LRA mechanism does not fully address the incentive issues  
201 of the Company in pursuing DSM or sales, issues Dr. Hansen addresses in his  
202 testimony.

203 **Q: Does Rocky Mountain Power use a LRA mechanism to recovery lost**  
204 **revenues?**

205 A: No. Since about 2001 PacifiCorp, now Rocky Mountain Power, uses a surcharge  
206 on its Utah customers bills to collect its DSM program costs.

207 **Q: Any final comments?**

208 A: Again, based on the arguments set forth in Division testimony, the Division  
209 recommends that the CET pilot continue with the modifications laid out in Mr.  
210 Barrow's testimony.

211 **Q: Does that conclude your testimony?**

212 A: Yes it does.

Attachment  
DPU Exhibit No. 1.1R