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SOUTHERN CALIFORNIA GAS COMPANY

ADVANCED METERING INFRASTRUCTURE

REBUTTAL TESTIMONY

CHAPTER 2

SUMMARY OF AMI BUSINESS CASE

Prepared Rebuttal Testimony

of

Edward Fong

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

May 7, 2009

TABLE OF CONTENTS

I. BACKGROUND 2
II. INTRODUCTION 2
III. ECONOMIC ASSUMPTIONS AND METHODOLOGY 3
A. General Discussion of DRA's Testimony 3
B. General Discussion of TURN Testimony 4
C. Impact on SoCalGas Residential Rates 5
1. SoCalGas' AMI proposal will reduce average residential customer bills earlier than any of the CPUC's previously approved AMI projects 5
D. Cost of Capital and Discount Rate 5
1. SoCalGas' authorized cost of capital (COC) is the correct discount rate to be used in calculating the present value of costs and benefits 5
2. The COC may itself be too high for this class of long-term investment 7
E. Residual or Terminal Value 9
1. A terminal value or value of remaining assets has been explicitly or implicitly included the AMI business cases approved by the Commission 9
2. Including conservation as benefits accruing to the terminal value is consistent with the inclusion of operational benefits 12
IV. PROJECT CONTINGENCY AND SHARING MECHANISM 13
A. Project Contingency 13
1. The SoCalGas AMI project contingency of 10% is reasonable in light of the scale and long duration for the deployment of 6 million gas communications modules and 2 million gas meters over a large geographically dispersed territory. SoCalGas AMI deployment is not comparable to PG&E's or SCE's 13
B. Sharing Mechanism 14
1. The sharing mechanism proposed by SoCalGas (SoCalGas Errata to Prepared Direct Testimony, Chapter II, p. II-19) provides incentive for SoCalGas to manage and control overall project costs and return such benefits to ratepayers. SoCalGas is not putting customers at greater risk for operating benefits. Rather the risks for SoCalGas customers are significantly less than that of customers for SCE, SDG&E and PG&E 14
C. Post-deployment Sharing Mechanism 17
1. Post-deployment costs and benefits are estimated by SoCalGas for the total business case analysis and should be included in SoCalGas' post-deployment general rate cases 17
D. Conservation Impact and Benefits Impact on Sharing Mechanism 18
1. DRA and TURN's assertion that SoCalGas conservation benefits are more uncertain (higher at risk benefits) than that of SCE, PG&E and SDG&E is unproven, incorrect and contradicts DRA's own testimony in the SCE and SDG&E AMI cases 18
V. DIFFERENCES BETWEEN ELECTRIC AND GAS UTILITIES 21
A. Demand Response 21
1. SoCalGas has made no claims of, nor has it proposed demand response benefits despite the implications by UWUA and DRA that SoCalGas is putting forth an AMI business case that is based on such benefits or policies supporting demand response 21
B. Utility Operations 21
1. DRA, TURN and UWUA arguments that electric utilities and combined electric and gas utilities are different from gas utilities are specious and irrelevant 21
VI. OPERATIONAL BENEFITS 23
A. Remote Automated Meter Reading 23
1. Remote Automated Meter Reading (RAMR) is not a viable alternative to system wide AMI deployment 23
2. Funds authorized for SoCalGas Remote Automated Meter Reading (RAMR) in GRC TY2008 are included in SoCalGas' AMI deployment plan for the SDG&E overlap service territory. SoCalGas does not need to reduce base rates by recorded capital costs of its RAMR project 23
3. RAMR is not a cost effective solution for SoCalGas system-wide deployment nor is it comparable to the functionality provided by AMI 24
B. Customer Services Field (CSF) 25

1. DRA is selective and inconsistent in asserting that SoCalGas could capture AMI operating benefits associated with customer services field activities by adopting practices or standards established by PG&E and SDG&E and therefore are not dependent upon AMI....25
2. DRA is inconsistent in its approach in advocating that SoCalGas adopt PG&E and SDG&E CSF practices or policies and yet at the same time vehemently asserting that SoCalGas is not similar to PG&E, SDG&E or SCE with regards to its meter reading workforce....25

VII. TIMING OF AMI 26

A. DRA's recommendation that SoCalGas file an application for AMI no sooner than 2012 demonstrates the unrealistic perspective of DRA....26

VIII. CONCLUSION 27

I. BACKGROUND

The purpose of this testimony is to respond to the prepared direct testimony submitted by several intervening parties to the Southern California Gas Company's (SoCalGas) Advanced Metering Infrastructure (AMI) proceeding, Application (A.) 08-09-023. SoCalGas's AMI's application and supporting testimony[1] proposes to deploy AMI for approximately 6 million gas meters at an estimated deployment cost of approximately $1.08 billion over 7 year period (2009-2015).[2] My testimony will address several recommendations, assertions and analyses contained in the prepared testimonies of California Public Utilities Commission's (CPUC or Commission) Division of Ratepayer Advocates (DRA), The Utility Reform Network (TURN) and the Utility Workers Union of America (UWUA) filed on April 23, 2009.

Specifically, this testimony will address issues raised by the above intervening parties to my Chapter II, Summary of AMI Business Case, Errata to Prepared Direct Testimony and Errata to Prepared Direct Supplemental Testimony. SoCalGas was directed by Assigned Commissioner Grueneich and Administrative Law Judge (ALJ) Hecht to file supplemental testimony regarding the "appropriateness of the SoCalGas choices of communications infrastructure and battery operation" in a scoping memo and ruling issued on January 6, 2009.

II. INTRODUCTION

DRA, TURN and UWUA have made several claims or assertions that are not factually based and are contrary to the evidence SoCalGas has presented in Errata, prepared direct testimony, supplemental testimony or herein as rebuttal testimony. DRA, TURN and UWUA are incorrect or draw flawed conclusions in several instances of their prepared testimony.

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[1] SoCalGas filed Prepared Direct Testimony supporting A.08-09-023 on September 29, 2008, Supplemental Testimony on February 11, 2009 and Errata Testimony on March 6, 2009. The Errata Testimony supersedes Prepared Direct Testimony of September 29, 2008 and Supplemental Testimony of February 11, 2009.

[2] The California Public Utilities Commission denied SoCalGas request for 2009 pre-deployment funding of $12.4 million. Since a final decision will not be rendered until the late 4th quarter of 2009, the 7 year deployment period will shift to 2010-2016.

SoCalGas has presented a business case with AMI deployment cost estimates totaling approximately $1.08 billion during the seven-year deployment period. Moreover, the undiscounted total life cycle project costs are estimated to be approximately $1.843 billion and total life cycle operating benefits are estimated to be approximately $2.905 billion. SoCalGas ratepayers will benefit by approximately $19 million on a present value of revenue requirements (PVRR) basis over the life of the project. Societal benefits are approximately $27 million on a PVRR basis.[3] Even more important, operating benefits cover 85% of the total AMI project life costs, higher than any other utility AMI project that has been proposed and approved by the Commission.[4]

III. ECONOMIC ASSUMPTIONS AND METHODOLOGY

A. General Discussion of DRA's Testimony

DRA's testimony is contradictory and illogical. On the one hand, DRA argues that the contingency factor should be reduced for SoCalGas because deployment cost risks are less than other utilities. DRA then argues that the discount rate should be higher than SoCalGas' authorized cost of capital (COC) because the AMI project benefits are riskier than other utilities. DRA cannot have it both ways.

The operating benefits from SoCalGas' AMI project are greater in proportion to AMI life cycle costs than any of the other utilities, and yet DRA claims that actually realizing these benefits is "risky". DRA vigorously opposed the level of demand response benefits in the PG&E, SCE and SDG&E AMI cases. DRA's opposition to demand response benefits were offset by DRA's own advocacy for electric conservation benefits.

Further, DRA has done a complete about-face and criticizes the very expert on information feedback that DRA cited in its supporting testimony for conservation benefits (DRA

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[3] See Chapter II, Summary of Business Case, Errata to Prepared Direct Testimony of Edward Fong, p. 11-4, Table II-3.

[4] CPUC has approved AMI deployment for Pacific Gas & Electric (PG&E), San Diego Gas & Electric (SDG&E) and Southern California Edison (SCE). The operating benefit to project cost ratio range from approximately 59-70% (including cost from PG&E's AMI enhancement). See presentation by Aloke Gupta, CPUC Energy Analyst, September 4, 2008, "An Overview of California Smart Meter Policy & Deployment".

witness Mr. Geilen) in the SDG&E AMI case.[5] In other words, recognition of conservation benefits which were fundamental to DRA's final position in settlement with SCE and SDG&E have now become a 'risky' benefit in SoCalGas' AMI application.

DRA, TURN and UWUA assert that SoCalGas conservation benefits are overstated but their arguments are not based on any study, report or evidence. Moreover, none deny that SoCalGas' estimates of conservation amount to only approximately 1% of residential gas usage. SoCalGas has not included any conservation impact for core non-residential customers.

B. General Discussion of TURN Testimony

TURN essentially did not understand SoCalGas' AMI proposal. TURN has the fundamentals wrong. TURN would have the Commission believe that the tail (conservation) is wagging the dog (operational benefits), by claiming that SoCalGas' AMI proposal is a conservation program. (TURN, Nahigian, pp. 5-6) Quite the contrary. SoCalGas' proposed AMI deployment will result in approximately 85% of the total AMI life cycle costs to be covered by operational benefits. In my errata to prepared direct testimony, Chapter II, p. II-4, Table II-3 clearly shows that operating benefits on an undiscounted basis exceed undiscounted costs by over $1 billion over the project analysis planning period. Even under TURN's analysis, operating benefits are 78% of project life cycle costs (TURN, Nahigian, p. 1). TURN further argues that SoCalGas' estimated conservation benefit of 1% is overstated and that the present value of conservation benefits should be reduced from $148 million to $49 million (TURN, Schilberg, p. 4). Essentially, DRA and TURN propose residential conservation from information feedback to be approximately 0.33% or 1/3 of SoCal Gas' estimated conservation impact. SoCalGas witnesses Ms. Darby and Mr. Martin address the DRA, TURN and UWUA testimonies regarding conservation benefits in their rebuttal testimony.

[5] A.05-03-15, SDG&E AMI Application, DRA Testimony, Chapter 10, Ted Geilen, Information Feedback Systems

C. Impact on SoCalGas Residential Rates

1. SoCalGas' AMI proposal will reduce average residential customer bills earlier than any of the CPUC's previously approved AMI projects

DRA's assertion that SoCalGas' AMI proposal would raise rates for SoCalGas customers over the 25-year analysis period is false. As shown in my Errata to Prepared Direct Testimony, Chapter II, Figure II-1 clearly shows that the average residential customer bill (monthly bills based on 46 therms of usage) by 2017 will be at or below the 2008 average bill level.

No other California investor-owned utility (IOU) AMI case shows the early decrease in utility distribution rates as SoCalGas' application. SoCalGas had shown that 85% of the AMI life cycle costs will be covered by operating benefits, significantly greater than any of the other utilities (SCE and SDG&E at approximately 60% and PG&E at approximately 72%). Even if one were to accept all of DRA's proposed changes to SoCalGas' AMI costs and benefits, over 77% of the life cycle costs are covered by operating benefits, still greater than those of PG&E, SCE and SDG&E (at DRA, Chapter 3, p. 3-16, line 12). In a similar vein, TURN's recommendations result in 78% of the life cycle costs recovered by operating benefits (at TURN, Nahigian, p. 1). These operating benefits are savings that will be reflected in distribution rates (e.g. elimination of meter readers, field technicians, etc.). My errata prepared direct testimony, Chapter II, p. II-11 shows the rapid rate at which these benefits are accruing to ratepayers in Figure II-1. Approximately 2 years after deployment (2017), assuming all other costs remain constant, the average SoCalGas residential customer will have a monthly bill less than their 2008 bill (even without conservation benefits). No other utility implementing AMI reflects such a rapid accrual of operating benefits to its residential customers.

D. Cost of Capital and Discount Rate

1. SoCalGas' authorized cost of capital (COC) is the correct discount rate to be used in calculating the present value of costs and benefits

DRA's reasoning and logic is flawed regarding the use of a discount rate that is different than the authorized COC. DRA states the following (DRA, Chapter 3, p. 3-10, lines 15-19):

> "One source of ratepayer risk in SoCalGas's AMI cost-benefit analysis is the possibility of future increases to SoCalGas' cost of capital (COC). <u>SoCalGas'current authorized COC, 8.68% is the lowest level it has been during the past 20 years.</u> Thus, while it may go lower, it may be more likely to go higher. It was 9.49% as recently as 2002; it has been as high as 11.51% (in 1986)."

First DRA willingly admits that SoCalGas' COC could go lower. DRA's fatal flaw in reasoning is its failure to recognize that the COC is driven by the anticipated inflation rate. In other words, the expected COC is, in large part, driven by the expected long-term inflation rate. The COC or prevailing long-term interest rates are highly correlated with expected inflation. The COC does not rise or decrease independently over a sustained period (in this case until 2034) without underlying inflation (i.e., cost escalation) increasing. Therefore, DRA's sensitivity analysis of increasing the discount rate to 10% and not changing the underlying escalation factor (inflation factor) is incorrect. If the Commission were to accept the higher discount rate based on the logic that the future COC for SoCalGas would be 10% or 1.32% greater than the current authorized 8.68%, then the Commission must, for consistency with economic principles, add 1.32% to the escalation factor used on all future costs and benefits in the SoCalGas AMI case.

The Commission's long standing policy has been to use the authorized COC to value utility investments. Using a discount rate that is different from the utility's authorized COC would be contrary to the Commission's past practice for the valuation of major utility capital investment projects. The authorized COC represents the best estimate reflecting input from all parties and the decision from the CPUC of the expected cost of long-term funds for the utility and is exactly what ratepayers are paying for those cost of funds (equity and debt). The authorized COC is used to compute the utility authorized return. Even more important, the authorized COC is used for the valuation of the complete portfolio of the utility's capital projects. Although any single or individual project may not represent the same risk of the total portfolio, the Commission has explicitly rejected the use of a separate and distinct COC from the utility's authorized COC on an individual project.[6]

DRA's arguments that the COC sensitivity or "robustness" test which was applied to the SCE case is justified for SoCalGas' AMI program are invalid. First, SCE has one of the lowest operating benefits in proportion to AMI life cycle costs. This COC "robustness" test was not applied to SDG&E which had a similar proportion of operating benefits. Even DRA admits to this inconsistency within its testimony (at DRA, Chapter 3, p. 3-11, lines 1-5). SoCalGas' AMI has a significantly larger proportion of operating benefits than SCE (85% to 60%) and thus there is no need to apply this "robustness" test.

2. The COC may itself be too high for this class of long-term investment

Society should value benefits to future generations much more than the current generation so as not to underinvest in projects that benefit future generations. In other words, society should use a lower interest rate to reduce the selfish near-term consumption of the current generation and invest in projects that provide long-term benefits to future generations. The social discount rate is often applied to the building of dams, bridges, highways, etc. Therefore, a more logical argument would be that a lower discount rate should be used for the valuation of the SoCalGas AMI project. A project such as SoCalGas's proposed AMI project can be assumed to provide benefit to a wide cross-section of society within its service territory. The rate payers who benefit from this project are representative of the society within the service territory, and therefore it is appropriate to use a social discount rate when valuing the investment in AMI. As shown in my Errata to Prepared Direct Testimony, Table II-3, SoCalGas AMI will generate reduced emissions (environmental benefits) over the analysis period of the project. These benefits are societal benefits by their very nature.

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[6] D.07-12-049, pp. 37-39

While there is debate as to exactly how to determine a social discount rate, especially when concerned with an intergenerational investment, it is common to equate the social discount rate to prevailing interest rates or the market risk free rate.

> "Given a desirable distribution of assets between generations and ignoring potential uncertainties and distortions in capital markets, the market interest rate constitutes an appropriate indicator of the social discount rate…"[7]

> "Thus, by classical theory, there should be little variation in individual discount rates except those due to credit limitations on an individual's ability to borrow to the full extent desired, or market imperfections limiting an individual's ability to save or invest. Thus, in the presence of perfect capital markets, the appropriate aggregate social discount rate would be simply the market risk-free rate."[8]

Thus, the discount rate of 8.68% used to value rate payer's costs and benefits in this case is rather high when considering the social discount rate, and itself represents a robustness test of the value of the project. Relative to prevailing market interest rates or the market risk-free rate, a rate of 8.68% is conservative, and would account for any risk associated with the long-term nature of this investment.

Finally, DRA makes a secondary recommendation to discount terminal benefits at a higher, 10% rate. As shown above, there is no basis for using a 10% rate when valuing this project, and that 8.68% represents a sufficiently high and conservative rate compared to prevailing interest rates or risk free rates. Further, there is evidence to suggest that benefits conferred to future generations should be discounted at an even lower rate.

> "Marglin (1963) provided the best recognized argument that investments may yield social returns that are not captured by private investors and hence are not reflected by the market rate of interest. If each member of the present generation is broadly concerned about the welfare of future generations, not just her own offspring, she will benefit from the actions of others to benefit future persons whether or not she takes such actions herself. Alternatively, investments made by selfish individuals may yield spillover benefits to others that are not reflected by the prevailing interest rate (Sen, 1982). In either case, future welfare takes on the

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[7] Howarth, Richard B. Noorgard, Richard B. 1993. "Intergenerational Transfer and the Social Discount Rate". *Environmental and Resource Economics* 3 337-358.

[8] Reinschmidt, Kenneth F. 2002. "Aggregate Social Discount Rate Derived from Individual Discount Rates". *Management Science* 48(2) 307-312

characteristics of a public good, and private individuals under invest in productive assets. This argument has been used to support the position that the appropriate social discount rate should be lower than the market interest rate."[9]

"(E)ven if the individual discount rates are constant over time, the aggregate social discount rate decreases over time, in a manner consistent with the use of the traditional exponential discount function."[10]

Thus, the proper valuation of an infrastructure project that provides inter-generational benefits must include the proper social discount rate. DRA argues that the discount rate should be 10% or higher than the authorized SoCalGas COC. The above discussion demonstrates that the appropriate discount rate should be at or lower than the market interest rate.

DRA is arbitrarily manipulating the COC in its so-called "robustness" test to justify its pre-disposed position that opposes the AMI project. However, DRA's argument for a higher discount rate is flawed and should be denied.

E. Residual or Terminal Value

1. A terminal value or value of remaining assets has been explicitly or implicitly included the AMI business cases approved by the Commission

DRA disputes the inclusion of an estimated value for the remaining assets after the last planning horizon year of 2034. DRA states the following in Chapter 3 of witness Mr. Levin's prepared testimony (at DRA, p. 3-14, lines 17-19).

"An analogous benefit was not adopted in PG&E's or SCE's AMI proceedings. DRA recommends that this "benefit" be excluded from SoCalGas' AMI business case as well."

TURN further cites the Commission's SDG&E AMI decision, D.07-04-043 (at TURN, Nahigian, pp. 18-19).

[9] Howarth, Richard B. Noorgard, Richard B. 1993. "Intergenerational Transfer and the Social Discount Rate". *Environmental and Resource Economics* 3 337-358.
[10] Reinschmidt, Kenneth F. 2002. Aggregate Social Discount Rate Derived from Individual Discount Rates. *Management Science* 48(2) 307-312

> "SDG&E has been the only other utility that has manufactured terminal value benefits and proposed that the Commission accept these "benefits" in its own AMI proceeding (A.05-03-015). The Commission rejected SDG&E's creation of terminal value benefits for projects. It found that terminal value benefits may be applicable to companies but are inapplicable to projects."

The last year in SoCalGas' AMI business case is 2034 since this year represents the end of the 20 year life of AMI modules installed in 2015, which is the last year of SoCalGas' AMI deployment period (2009-2015). However, SoCalGas will continue to install gas modules during the post-deployment period of its AMI business case (2016-2034) because of gas module failures and new meter growth that will occur during the post-deployment period. For this reason, approximately 2.032 million gas communications modules installed in SoCalGas' AMI business case will have remaining useful life beyond the last year of its business case analysis, 2034. In other words, approximately 1/3 of over 6 million gas communication modules will have remaining useful life. For example, in year 2033, gas modules installed as replacement modules (replacement for module failures) or for new meter growth will have some 18 years of remaining life by 2035. These gas modules will, in theory, continue to generate benefits even after the last year of the business case analysis, 2034.

TURN's analysis of this issue is flawed. TURN's implied, unstated and illogical assumption is that the remaining assets (post-2034) will be rendered immediately useless at that time. In other words, the remaining gas modules will not be generating any future stream of benefits. Specifically, as SoCalGas approaches the end of the useful life of the AMI system, SoCalGas will have an upgrade/replacement strategy in place. In reality, the AMI system that is initially deployed (2009-2015) will be gradually replaced prior to 2034. Of course, no one knows the exact nature of the replacement technology that will be available in 2034. More practically, as the initial gas module installation will require approximately 5 years, most likely a replacement plan will also take a similar amount of time. Therefore, installation of new gas modules for normal failure replacement and customer growth beginning some time in the late 2020 decade must satisfy an upward compatible strategy to the next generation of AMI systems.

All of the gas modules cannot be replaced instantaneously and so new gas modules at some point during the latter part of the 20-year analysis period must be compatible with the next AMI system. In other words, purchase of new gas modules during the latter years of the planning horizon will not necessarily be identical to the current gas modules. These gas modules will continue to be useful during the next generation AMI system.

Therefore, the terminal value represents the discounted **net** benefits (O&M benefits net costs) of these remaining assets during the post-2034 period. PG&E and SCE included implicit terminal value calculations in their business case analysis which were adopted by the Commission in its decisions approving those AMI programs. PG&E included a tax benefit for the undepreciated expenses associated with remaining AMI electric meters and gas modules. SCE included the remaining book value of the remaining AMI assets in the terminal year. The Commission has accepted the concept of an implicit terminal value in PG&E's and SCE's AMI cases. (See Attachment II-1, Response to SoCalGas verbal data request.) SoCalGas provides greater transparency in its explicit identification of the methodology and the calculation for a terminal value estimate.

Finally, TURN's argument that the Commission rejected the concept of terminal value in SDG&E's case is misleading. Specifically, the Commission did not accept SDG&E's "replacement life cycle" (aka double life cycle) <u>methodology, as opposed to the concept of</u> terminal value where SDG&E was attempting to explicitly model the cost and benefits of replacing the entire AMI system at the end of the initial life cycle. SoCalGas was attempting to address the very issues pointed out by TURN regarding "…life depends on the system as a whole operating correctly and reliably". (at TURN, Nahigian, p.19)

If the terminal value benefit is to be excluded, then SoCalGas's analysis would require significant change in assumptions. The change in assumptions would not correctly reflect the reality of expenses that would be incurred from AMI deployment. Specifically, all replacement expenses related to gas module failures that occur during the post-deployment period (2016-2034) would need to be eliminated. In addition, all new meter growth requiring additional gas communication modules during the post-deployment period would also need to be excluded from the business case analysis. Obviously, this radical change in assumption seems absurd, as is TURN's and DRA's assertion that there be no terminal value benefits. Therefore, DRA or TURN cannot arbitrarily remove the terminal benefit without removing all of the post-deployment costs and benefits associated with the assets (gas modules) that have remaining life after the final year of the analysis horizon.

2. Including conservation as benefits accruing to the terminal value is consistent with the inclusion of operational benefits

TURN further states that (TURN, Nahigian, p. 19)

> "If the Commission does not reject SoCalGas' terminal value benefit it must adjust it downward to exclude conservation benefits that SoCalGas does not intend to provide ratepayers."

TURN's argument and extensive discussion is illogical. First, conservation benefits are provided to the customers who voluntarily change their behavior to conserve gas consumption. These customers benefit with a lower gas bill than otherwise would have occurred without conservation. From a customer perspective, all customers will benefit from a reduction in operating expenses because utility distribution costs are reduced for all customers. In some cases, customers that are large users of gas will accrue larger benefits (cents per therm for distribution costs) than low usage customers. Nevertheless, all SoCalGas customers will benefit from lower operating costs resulting from AMI. Conservation benefits, however, only accrue to those customers who conserve gas usage resulting from AMI information feedback. If the operating benefits are to be included in the terminal value calculation, then conservation benefits should be treated similarly.

Therefore, TURN is incorrect in stating that SoCalGas does not intend to provide conservation benefits to ratepayers. The amount of conservation benefits is, in fact, ratepayer specific and driven by ratepayer behavior.

IV. PROJECT CONTINGENCY AND SHARING MECHANISM

A. Project Contingency

1. The SoCalGas AMI project contingency of 10% is reasonable in light of the scale and long duration for the deployment of 6 million gas communications modules and 2 million gas meters over a large geographically dispersed territory. SoCalGas AMI deployment is not comparable to PG&E's or SCE's

DRA states the following:

> "DRA challenges SoCalGas's requested contingency allowance on two broad criteria. First, there are past AMI precedents of the Commission granting SDG&E and PG&E each 8.0% contingency allowances. SCE was granted a very similar contingency allowances in D.08-09-038." Footnotes omitted. (DRA, Chapter 4, p.4-11, lines 12-15)

SoCalGas proposes to deploy AMI over 6 million gas meters that spans a service territory covering approximately 20,000 square miles and 500 communities over a 7-year period. Uncertainties that cannot be anticipated or planned are inherent in a project of this scale and geographical diversity. Conditions will certainly change by 2015 from those we know today. A 10% contingency on total estimated project cost, especially for a project of this scope and scale, is reasonable. No other utility is planning to install on the scale of 6 million gas modules and replace 2 million gas meters as a consequence of AMI deployment.

Specifically, electric AMI installations are a relatively simple process of removing the electric meter from the electric socket on the panel and installing the new AMI electric meter. Gas AMI installations involve unscrewing the dial register and installing the retrofit gas communications module. The gas module installation process for SoCalGas would be similar to that of PG&E and SDG&E. In addition to the 4 million gas module retrofits on existing gas meters, SoCalGas will be replacing over 2 million gas meters during the AMI installation period of 5 years. SDG&E plans to retrofit only 900,000 gas meters[11]. PG&E is planning to retrofit 4.2 million gas meters[12]. Because of the scale of SoCalGas gas meter installations, the workforce

[11] D.07-04-043, p. 2.
[12] D.09-03-026, p. 3.

and material logistic complexities are an enormous challenge on an order of magnitude greater than SDG&E's and PG&E's deployment challenges.

Even DRA witness Mr.Blunt acknowledges that all of the current AMI deployments in California are delayed for a variety of technical reasons. (DRA, Chapter 6, p.6-6 to 6-9). Specifically, DRA states (DRA, Chapter, p. 6-6):

"SoCalGas' estimated date of full deployment is probably over optimistic."

The 10% contingency will cover unanticipated adverse conditions (weather, natural disasters, neighborhood streets and road construction, etc.) that will slow or delay installation in certain areas. Shifting and redeploying resources from one area to another because of unanticipated obstacles could increase project cost. Business process changes cannot be fully anticipated at this time, but will most likely occur during the installation period. These business process changes will impact AMI project requirements, schedule and scope of work that cannot be fully anticipated. Even DRA witness Mr. Blunt's testimony identifies the possibility of AMI project delays (at DRA, Chapter 6, pp. 6-6 to 6-9). The 10% contingency covers these unanticipated delays.

B. Sharing Mechanism

1. The sharing mechanism proposed by SoCalGas (SoCalGas Errata to Prepared Direct Testimony, Chapter II, p. II-19) provides incentive for SoCalGas to manage and control overall project costs and return such benefits to ratepayers. SoCalGas is not putting customers at greater risk for operating benefits. Rather the risks for SoCalGas customers are significantly less than that of customers for SCE, SDG&E and PG&E

DRA proposes the following asymmetrical risk sharing mechanism (at DRA, Chapter 4, p.4-13 to 4-14):

> "…DRA proposes an asymmetrical risk sharing band where shareholders bear a greater portion of the cost overruns (50%). For cost under runs, DRA recommends that the ratepayer/ shareholder split remain at 90%/10%. Furthermore, DRA recommends that the size of the risk sharing band be plus or minus $60 million, rather than $100 million."

DRA further argues (DRA, Chapter 4, p.4-14, lines 8-10):

> "That is, SoCalGas should be wiser for going fourth amongst major California IOUs and yet, it is also putting ratepayers at greater risk for rate increases. A smaller band would provide ratepayers greater protection."

DRA adds (DRA, Chapter 4, p.4-13, lines 16-19):

> "…(T)he proposal has a thin margin of surplus benefits….Therefore, there is greater chance for costs to exceed benefits in this AMI than in previous AMI proceedings."

As DRA acknowledged, all of the California IOUs with Commission approved AMI deployments have a 90%/10% ratepayer/shareholder sharing mechanism for cost overruns. DRA, Chapter 4, p. 4-13, lines 1-5). DRA is completely inconsistent or selective in its approach to contingency and the sharing mechanism. In one case, DRA argues that SoCalGas' contingency percentage should be comparable to the contingency approved for the other IOUs and therefore the 10% contingency proposed by SoCalGas should be reduced to 8%. DRA then argues that the sharing band for SoCalGas should be more stringent than the other IOUs. However, for the cost overrun sharing mechanism, DRA proposes a 50%/50% sharing for cost overruns which is different than that adopted for the other CPUC approved AMI projects. DRA argues that SoCalGas should be treated similarly for contingency funding, but not for other elements that also represent risks and risks mitigation (sharing percentages and sharing band).

First DRA is just plain wrong about SoCalGas, "putting ratepayers at greater risk for rate increases." SoCalGas is committing to operating benefits as estimated during the deployment (formula tied to gas module installations). Second, no other IOU AMI case shows the early decrease in utility distribution rates as SoCalGas. SoCalGas had shown that 85% of the AMI life cycle costs will be covered by operating benefits, significantly greater than any of the other utilities (SCE and SDG&E at approximately 60% and PG&E at approximately 65-70%). Even if one were to accept all of DRA's proposed changes to SoCalGas AMI costs and benefits, over 77% of the life cycle costs are covered by operating benefits, still greater than PG&E, SCE and SDG&E. These operating benefits are savings that will be reflected in distribution rates (e.g. elimination of meter readers, field technicians, etc.). My Errata Prepared Direct Testimony, Chapter II, p. II-11 shows the rapid benefits that are accruing to ratepayers in Figure II-1. Approximately, two years after deployment (2017), the average SoCalGas residential customer will have a monthly bill less than their 2008 bill (even without conservation benefits). No other utility implementing AMI shows such a rapid reflection of benefits that will accrue to residential customers. Therefore, SoCalGas is not putting customers at greater risk for operating benefits. Rather the risks for SoCalGas customers are significantly less than that of customers for SCE, SDG&E and PG&E.

Finally, the argument of "thin" margin of benefits claimed by DRA as justification for their sharing mechanism proposal is completely contrary to Commission decisions in similar AMI proceedings. In the SDG&E AMI case, A.05-03-015, DRA asserted that the SDG&E proposal was $115 million in the negative with an estimated cost of $607 million or almost 19% in the red (PVRR).[13] DRA similarly asserted in the SCE AMI case that SCE's AMI was $184 million in the negative with estimated cost at $1,981 million or approximately 9% in the red (PVRR).[14] Clearly, a 19% and 9% negative PVRR proposed by DRA in the SDG&E and SCE AMI cases, respectively did not any way prevent DRA from agreeing to 90/10 sharing mechanism for cost overruns. In addition, the Commission approved a symmetrical 90/10 sharing mechanism for SDG&E. In other words, even though DRA asserts the "thin" margin for SoCalGas's AMI proposal, the SDG&E AMI project appears to be just as "thin" and received a 90% ratepayer and 10% shareholder sharing for cost overruns as well as cost underruns.

The interests of ratepayers are best served by providing an incentive to SoCalGas to manage and control AMI deployment costs to the lowest possible levels. The symmetric sharing mechanism provides that incentive. Symmetric sharing mechanisms (incentive for cost underruns) have benefited ratepayers as demonstrated through the Gas Cost Incentive Mechanism (GCIM).

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[13] SDG&E AMI, A.05-03-015, DRA's Testimony: Chapter 1 (ERRATA) - Introduction and Policy (Witness Ted Geilen), page 1-1 E 9/12/06

[14] SCE AMI, A.07-07-026, DRA's Testimony: Chapter 1 (ERRATA) - Overall Policy and Energy Conservation Benefits (Witness Ted Geilen), page 1-1

C. Post-deployment Sharing Mechanism

1. Post-deployment costs and benefits are estimated by SoCalGas for the total business case analysis and should be included in SoCalGas' post-deployment general rate cases

The Commission should note that no other IOU with a Commission-approved AMI has a post-deployment sharing mechanism, even when the operating benefits for PG&E, SCE and SDG&E are less in proportion to AMI life cycle costs than for SoCalGas.

DRA proposes that (DRA, Chapter 4, pp 4-14 to 4-15, begin line 16):

> "…a post-deployment period risk-sharing mechanism be established to protect ratepayers from post-deployment cost overruns related to module battery failures and other AMI-related maintenance cost overruns."

First, DRA has provided no substantive evidence of module battery failures that would exceed what is forecasted in SoCalGas' testimony, workpapers and supporting rebuttal evidence. Witness Mr. Serrano has presented evidence in his rebuttal testimony (at SoCalGas Prepared Rebuttal Testimony, witness Mr. Serrano, Section V.A to V.E, pp. 14-18) that the potential SoCalGas AMI technology vendors have experienced module failure rates less than the 0.5% assumed in the SoCalGas AMI proposal. Second, DRA has not presented any other areas of significant post-deployment "maintenance" cost overruns. To the contrary, DRA's IT witness, Mr. Jennings (Chapter 5) claims that SoCalGas has overestimated IT costs in several technologies and therefore should have lower post-deployment maintenance costs. Finally, DRA is clearly proposing yet another asymmetric sharing mechanism.

To be more succinct, the post-deployment period risk sharing band proposal is a moot point since future costs and benefits would be addressed in future years' general rate case (GRC) applications. To litigate estimated post deployment versus actual over/under runs in costs and benefits every year during the post-deployment period is absurd and unproductive. One would need to measure precise costs incurred some 20 years from now that are due exclusively to AMI and what benefits could have occurred without AMI. The GRC is the right regulatory forum to determine treatment of post-deployment costs. If post-deployment operating costs and benefits are to be determined outside the normal GRC proceedings, then the very nature of GRC establishing test year costs and benefits will change. Once again, DRA attempts to deviate from the treatment of post-deployment benefits already established by the Commission for other IOU AMI projects by proposing a unique post-deployment sharing mechanism for SoCalGas. SoCalGas' proposed stand alone AMI system is similar to PG&E's stand alone gas AMI technology. The operating benefits are higher than PG&E's (in proportion to total life cycle costs) and yet DRA proposes a special post-deployment sharing mechanism for SoCalGas.

DRA's proposal for a post-deployment sharing mechanism has no logical foundation nor has DRA proposed a practical and tractable mechanism.

D. Conservation Impact and Benefits Impact on Sharing Mechanism

1. DRA and TURN's assertion that SoCalGas conservation benefits are more uncertain (higher at risk benefits) than that of SCE, PG&E and SDG&E is unproven, incorrect and contradicts DRA's own testimony in the SCE and SDG&E AMI cases

Again, DRA and TURN are wrong. SoCalGas has proposed conservation benefits that constitute 1% of residential usage. To be conservative SoCalGas has not included any conservation benefits for the higher volume core commercial and industrial customers. In fact, DRA witness Mr. Geilen in the SDG&E AMI proceeding proposed gas conservation benefits that resulted in larger customer participation rates than assumed by SoCal Gas. DRA witness Mr. Geilen stated the following:

> "Individual residential ratepayers which will avail themselves of the web display can, on average, reduce their electric bill by $7 and their natural gas bill by $10. Four Percent (4%) of all SDG&E customers are expected to access their energy use data online in 2009, increasing to 28% of customers by 2024." [15](footnotes excluded)

SoCalGas witness Mr. Martin has assumed 6.5% participation rate for SoCal Gas customers and only growing at a 1% per year or roughly 0.065% per year. In other words, by

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[15] SDG&E AMI, A.05-03-015, DRA's Testimony: Chapter 10 (ERRATA) – Information Feedback Systems (Witness Ted Geilen), pp. 10-1 to 10-2

2024, SoCal Gas's web participation rate is roughly 7.5%, far less than DRA's participation rate of 28% used in the SDG&E case for gas.

DRA and TURN argue that conservation benefits should be reduced to 0.032% of residential gas usage. This reduction will result in a reduction of approximately $100 million in conservation benefits. DRA and TURN have concentrated on the uncertainly of conservation benefits and therefore the downside of such benefits. SoCalGas' 1% conservation is calculated by estimating the participation rate. The participation rate is a function of the customer response rate, customer interest in conservation and level of computer literacy. (See DRA, Chapter 7, p. 7-3, line 8)

As much as DRA and TURN are arguing for the downside of conservation and adjusting the participation rate by changing the level of "customer interest" a stronger argument can be made for the upside to conservation. Specifically, the interest in environmental consciousness would probably raise the percent of customers wanting to understand their carbon footprint and gas usage patterns and thereby increasing their "customer interest."

Clearly, computer literacy is increasing at a rapid rate. Recent information shows that 68% of SoCalGas customers have home computers, 65% have access to the internet and 60% have internet access at home. In addition, 30% of customers pay bills on-line and 48% have made a purchase on-line.[16] In other words, key indicators show that computer literacy is rising (not surprising). The response rate, percent of customers expressing interest and computer literacy were assumed to be at current (2008) levels (SoCalGas, Chapter V, Ms. Darby, p. V-12). By 2016, all of these underlying assumptions used for calculating the participation rate are more likely to be higher rather than lower than the assumed 2008 levels. Moreover, as more energy usage information becomes available through AMI deployment at PG&E, SCE and SDG&E, more innovative methods, channels and technologies will be utilized to deliver and present such information to customers. Simply put, if conservation were to increase from 1% to 2%, then

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[16] Arbitron Information Services, Arbitron Inc., Scarborough Residential Data: Bakersfield, Release 2, 2008, Oct07-Sep08; Fresno, Release 2 2008 Aug07-Jul08; Los Angeles, Release 2 2008, Aug07-Jul08.

SoCalGas will show an additional $148 million in present value benefits for customers. The 2% conservation scenario is more plausible than a 0.33% conservation scenario proposed by both DRA and TURN.

For example, a change in the assumption of the computer literate population from the current 41% to 82% would double the conservation benefit. An increase in the response rate would increase the conservation even more. To be clear, for all of DRA and TURN's posturing of risky conservation benefits (arguing for lower conservation benefits), every key variable used to calculate the participation rate appears to have more upside than downside. An increase of the conservation impact from 1% to 2% will provide conservation benefits that will make the SoCalGas AMI proposal one of the most cost effective in the State. In addition, SoCalGas' high percentage of operating benefits is providing SoCalGas customers a floor for benefits that will accrue regardless of the realization of conservation benefits.

Therefore, DRA and TURN have not demonstrated that the risks of SoCalGas benefits are higher. SoCalGas' sharing mechanism for over runs should be no different than what has been approved for SDG&E, PG&E and SCE.

A sharing mechanism of 90%/10% for cost under runs provides ratepayers with the overwhelming majority of the project savings (expenses less than authorized benchmark level). For example, if SoCalGas were to spend $10 million less than the authorized level, ratepayers would be returned $9 million. Therefore, SoCalGas has an incentive to control and manage costs below the authorized benchmark level. A symmetrical sharing mechanism is fair for SoCalGas and ratepayers.

Finally, given the discussion in Section IV A-D, SoCalGas sees no reason why the sharing band should be reduced. The sharing band should be consistent with the final contingency amount as proposed by SoCalGas.

V. DIFFERENCES BETWEEN ELECTRIC AND GAS UTILITIES

A. Demand Response

1. SoCalGas has made no claims of, nor has it proposed demand response benefits despite the implications by UWUA and DRA that SoCalGas is putting forth an AMI business case that is based on such benefits or policies supporting demand response

SoCalGas proposes that customer specific AMI gas usage data be provided on a daily basis in hourly intervals. This gas usage information would not be available without AMI. SoCalGas is not proposing changes to gas pricing or any form of dynamic pricing for gas. SoCalGas has not claimed nor estimated demand response benefits associated with SoCalGas AMI.

B. Utility Operations

1. DRA, TURN and UWUA arguments that electric utilities and combined electric and gas utilities are different from gas utilities are specious and irrelevant

UWUA (UWUA, p.3, lines 3-18), DRA (DRA, Chapter 2) and TURN (TURN, Nahigian, pp. 4-5) dedicate a portion of their prepared testimony arguing the difference between an electric and gas utility. SoCalGas had not claimed similarities with electric rates or electric operations. DRA and TURN argue gas AMI was necessary in the combined gas and electric utilities for PG&E and SDG&E. Specifically, TURN states the following:

> "The reason that combined electric and gas utilities implemented AMI technology is to capture the full benefits operational benefits and take advantage of the economies of scale for meter installations. If a combined utility failed to deploy an advanced gas metering system with its electric metering infrastructure then the operational meter reading savings would be lost or substantially diluted because the utility would still to send out meter readers to the same customer premise to read the gas meter (while reading the electric meter remotely)."

DRA makes similar arguments (at DRA, Chapter 2, p.2-10, lines 15-18)

> "In sharp contrast to PG&E and SDG&E, SoCalGas is a gas-only utility, and so, has no demand response benefits to offer. As stated above, none of the State's electric AMI policies support gas AMI. Therefore, it does not make sense for

SoCalGas to rely on PG&E and SDG&E examples to support gas AMI for SoCalGas."

Several premises or assertions by TURN are incorrect. The logic put forth by TURN is flawed. The combined electric and gas utilities, PG&E and SDG&E, provide proportionately less operating benefits than SoCalGas' gas-only utility case. Under TURN's reasoning, PG&E's operational benefits should be as large (if not larger) than SoCalGas'. In fact, SoCalGas will cover 85% of the AMI life cycle costs with operating benefits. Even TURN states that only 72% of PG&E's AMI system will be covered by operational benefits (TURN, Nahigian, p. 4). Therefore, the synergies from eliminating combined electric and gas meter reading operations do not provide proportionally more operating benefits than the 85% of AMI costs covered by operating benefits in SoCalGas' AMI proposal.

TURN's argument is further flawed. PG&E is essentially deploying a stand alone gas AMI system that is independent of its electric AMI technology. Both PG&E and SDG&E gas module installations are not combined with the electric meter installations. In fact, PG&E (as of this writing) has approximately 1.7 million AMI gas modules installed, but only 0.6 million electric AMI meters installed. The "perceived" installation cost synergies of AMI on gas meters and AMI electric meters on the same meter read route are in fact non-existent. The skill set required to install electric meters is different than that required to install AMI gas modules. Even more so, the skill set required to replace gas meters is far more advanced than that required to install the AMI gas module.

DRA reasoning or statements are irrelevant to SoCalGas' AMI proposal. SoCalGas has not claimed any demand response benefits. SoCalGas has pointed out that by 2012, PG&E and SDG&E customers will have gas AMI systems. In fact, PG&E will have a separate stand alone gas AMI system, independent of its electric AMI system. Furthermore, PG&E and SDG&E have no synergies from gas and electric AMI installations. The lack of synergies in combined gas and electric utilities further illustrate that synergies between a separate gas utility (SoCalGas) and an electric utility (SCE) are even more dubious. SoCalGas has already demonstrated the increased cost of the SoCalGas/SCE hybrid AMI scenario over the gas stand alone scenario.

Therefore, neither synergies for costs nor operating benefits exist for combined utilities.

VI. OPERATIONAL BENEFITS

A. Remote Automated Meter Reading

1. Remote Automated Meter Reading (RAMR) is not a viable alternative to system wide AMI deployment

TURN and UWUA imply that RAMR would be more viable than AMI for SoCalGas gas meters (TURN, Nahigian, pp. 8-10, at UWUA, p. 16, lines 6-7). First, RAMR is not a long-term viable technology. RAMR has been applied at SoCalGas and SDG&E for the subset of high-cost-to-read meters. In the previous AMI cases for PG&E and SDG&E, neither TURN nor DRA examined the scenario as to whether PG&E or SDG&E customers would have been better off with an electric only AMI implementation and either continued reading gas meters with meter readers or using Remote Automated Meter Reading (RAMR) technology. Realistically, RAMR is not a viable technology for system wide deployment. Furthermore, RAMR will not provide gas usage on a daily basis in hourly usage intervals. Without daily meter reads of hourly usage, SoCalGas would not be able to capture basic operational benefits associated with eliminating the clock/registration check that is required for certain customer services field orders.

2. Funds authorized for SoCalGas Remote Automated Meter Reading (RAMR) in GRC TY2008 are included in SoCalGas' AMI deployment plan for the SDG&E overlap service territory. SoCalGas does not need to reduce base rates by recorded capital costs of its RAMR project

TURN states (TURN, Nahigian, p. 12)

> "If the Commission approves SoCalGas's AMI project it should reduce SoCalGas' base rates by the recorded capital costs of its RAMR project that would be stranded by AMI."

First, installed RAMR devices will not be stranded as a result of SoCalGas AMI. Even TURN acknowledges that the current installed RAMR base "has a 5 to 8 year payback". (at

TURN, Nahigian, p. 10). SoCalGas has suspended the RAMR installations for exactly those reasons that TURN cites. SoCalGas has no desire to have RAMR devices regarded as stranded assets. SoCalGas plans to replace the RAMR devices at the end of AMI deployment (most likely 2015 or 2016). At that point, the RAMR devices installed in 2006-2008 period would have provided operating benefits to ratepayers that would justify the installed RAMR assets. The only RAMR assets that may have some stranded asset risk would be those installed in early 2009 (before the RAMR suspension). This small number of RAMR devices would have almost 7 years of useful life for ratepayers by the end of 2015 or early 2016.

SoCalGas recognized that funds had been authorized in GRC TY2008 for installation of approximately 100,000 drive-by RAMR devices per year. As of March 2009, SoCalGas has approximately 180,000 RAMR devices. Funds for 2010 and 2011 are to be used for approximately 106,000 AMI gas modules/meters in the Orange County SDG&E overlap territory. These issues are covered in my Errata to Prepared Direct Testimony, p. II-15. Therefore, any remaining funds from the GRC RAMR authorization in 2010-2011 will be used in the AMI implementation, specifically for the Orange County SDG&E overlap territory.

3. RAMR is not a cost effective solution for SoCalGas system-wide deployment nor is it comparable to the functionality provided by AMI

TURN proposes that SoCalGas continue to deploy RAMR in lieu of SoCalGas' AMI proposed deployment. (TURN, Nahigian, pp. 8-10) TURN admits that SoCalGas RAMR project only addressed high-cost-to-read meters (high cost routes) and was not a solution to a system-wide deployment. TURN states the following (TURN, Nahigian, p. 10)

> "The economics of the RAMR are far superior to AMI economics in this application, even under all of SoCalGas' assumptions."

TURN implies that RAMR would be superior in a system-wide deployment. This inference is incorrect. RAMR economics work for high-cost-to-read meters, not for the whole SoCalGas system. If RAMR economics were positive for the whole SoCalGas meter reading system, then SoCalGas would have proposed deployment on the system-wide scale back in the 2008 GRC or earlier. RAMR does not provide the functionality of an AMI system. RAMR cannot provide daily meter reads or interval data. RAMR is not superior to AMI in a system-wide deployment. RAMR will not lead to Customer Services Field operational benefits nor provide conservation benefits.

B. Customer Services Field (CSF)

1. DRA is selective and inconsistent in asserting that SoCalGas could capture AMI operating benefits associated with customer services field activities by adopting practices or standards established by PG&E and SDG&E and therefore are not dependent upon AMI

DRA states the following (DRA, Chapter 6, p. 6-13):

> "A significant amount of Customer Services Field benefit comes from elimination of activities that are not currently performed for PG&E or SDG&E by field personnel. DRA questions whether these benefits are truly AMI-related. SoCalGas could simply petition the Commission to allow a less costly means of providing comparable service, or make cost-reducing changes at its own initiative if not constrained by Commission directives. To the extent these actions could be undertaken with, or without AMI, there may be benefits, but such benefits would not be properly considered benefits of AMI."

In fact, SoCalGas is constrained by Commission directive. (See SoCalGas witness Mr. Serrano Errata to Prepared Direct Testimony, Chapter III, pp. III-32 to III-33) With AMI, SoCalGas can use AMI hourly usage data to more accurately conduct a gas flow test without the service technician on the customer's premise. DRA is suggesting a fundamental change in SoCalGas field practices that no party has previously proposed, endorsed or supported.

2. DRA is inconsistent in its approach in advocating that SoCalGas adopt PG&E and SDG&E CSF practices or policies and yet at the same time vehemently asserting that SoCalGas is not similar to PG&E, SDG&E or SCE with regards to its meter reading workforce

As stated above, DRA asserts that SoCalGas should adopt some of PG&E and SDG&E's CSF policies and practices. However, DRA dismisses SoCalGas' assumption that if the Commission does not approve SoCalGas' AMI proposal, then SoCalGas could not sustain the current level of lower compensated part-time meter reading workforce. Specifically, SoCalGas is essentially adopting an assumption of a full-time meter reading workforce that PG&E, SCE and SDG&E have had historically.

DRA states the following (DRA, Chapter 6, p. 6-3):

> "Further, the current composition of the SoCalGas' meter reading labor force is overwhelmingly weighted toward part-time workers, and could plausibly remain so. DRA finds SoCalGas's explanation that labor union negotiations would lead to a reversion to a 100 percent full-time labor force unconvincing."

But full-time meter readers are essentially the composition of the PG&E, SDG&E and SCE meter reading workforce and therefore appear to be the common practice of utilities. Specifically, if SoCalGas were not permitted to implement AMI, SoCalGas makes a reasonable forecast assumption that compensation for meter readers would likely revert back to the wage benchmarks established by other utilities prior to AMI implementation.

In other words, DRA contends that SoCalGas should adopt CSF policies and practices currently in place at PG&E and SDG&E, but not adopt meter reading workforce practices established in those very same utilities. DRA is selective in its rationale for adopting and then not adopting policies and practices of other utilities.

VII. TIMING OF AMI

A. DRA's recommendation that SoCalGas file an application for AMI no sooner than 2012 demonstrates the unrealistic perspective of DRA

DRA recommends the following (DRA, Chapter 1, p.1-3, lines 3-7):

> "DRA recommends, should SoCalGas desire to pursue AMI in the future, that the Commission direct SoCalGas to re-file no sooner than 2012…"

In addition UWUA recommends the following (UWUA, p. 5, lines 15-21)

> "Several of the reasons put forth by SoCalGas for its rejection of a hybrid AMI system appear to reflect the need for additional time to work out technological issues associated with the communications requirements for both gas and electric usage. However, there is no apparent reason for rushing into a stand-alone system

funded by SoCalGas ratepayers when it appears that additional time and investigation may result in a more efficient and effective system."

UWUA presented no evidence that "technological issues" are the barrier to an economically viable hybrid AMI solution. SoCalGas has demonstrated that a hybrid solution with SCE is not cost-effective (my Errata to Prepared Direct Testimony, Chapter II, pp. II-3 to II-4 and pp. II-7 to II-8). The stand alone economics are superior to the hybrid solution. Table II-2 in my Errata to Prepared Direct Testimony assumes that technical hurdles are overcome and that SoCalGas/SCE AMI is integrated between the two utilities. As pointed out in my supplemental testimony, a SoCalGas/SCE hybrid AMI solution will not address the 2 million gas meters that are not in the SCE overlap scenario. A 2 million meter stand alone solution would still be needed for these meters.

Even if the DRA prevails in this application, the Commission should understand the implications of such a decision. If SoCalGas could not make a request for gas AMI until 2012, full deployment of gas AMI in California would not be completed until 2020 at the earliest. This means, by then, approximately 6-7 million gas meters in PG&E and SDG&E's service will already have had AMI technology installed and operating for over 8 years. Given that PG&E has already installed approximately 1.7 million gas modules in a stand alone gas AMI system, no synergies exist between the PG&E's electric AMI and gas AMI networks, and the percent of operating benefits covering life cycle PG&E AMI costs appear to be less than that proposed by SoCalGas, the Commission should see DRA's position as no more than a stalling tactic. SoCalGas covers more of the AMI life cycle costs with operating benefits than any of the other utilities. In addition, conservation benefits are but a small portion of residential load (approximately 1%). SoCalGas customers should not be treated as second class customers relative to PG&E and SDG&E gas customers nor should we delay the AMI benefits to these customers.

VIII. CONCLUSION

SoCalGas' AMI proposal provides more certain operating benefits to ratepayers than any other AMI project already approved by the Commission. The average SoCalGas residential customer is expected to have a lower average monthly gas bill (assuming all else remains constant) approximately 2 years after deployment of AMI. Estimated conservation benefits are reasonable and have a high potential for increasing over time.

This concludes my testimony.

Attachment II-1

Southern California Edison Response to SoCalGas Verbal Data Request

Southern California Edison
SCE AMI Phase III SmartConnect A.07-07-026

DATA REQUEST SET AMI Phase III SCG-02

To: SOCALGAS
Prepared by: Paul Kubasek
Title: Manager
Dated: 04/13/2009

Question 01:

Did the SCE cost-benefit analysis include a terminal or residual value amount for SmartConnect meters in place beyond its business case analysis period (2008-2032) due to customer growth and AMI meter failures?

Response to Question 01:

SCE did not include a terminal value for meters installed after the deployment period due to customer growth or AMI meter failures. The costs and benefits associated with replacement and growth meters through 2032 were included in SCE's cost-benefit analysis. At the end of the analysis period (2032), SCE included the recovery of all replacement and growth meters in the cost-benefit analysis, including charging off the remaining undepreciated plant basis.