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**PREPARED DIRECT TESTIMONY OF  
HERBERT S. EMMRICH  
SOUTHERN CALIFORNIA GAS COMPANY**

(Embedded Cost Proposal)

**September 3, 2003**

**2005 BIENNIAL COST ALLOCATION PROCEEDING**

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**PREPARED DIRECT TESTIMONY OF  
HERBERT S. EMMRICH  
SOUTHERN CALIFORNIA GAS COMPANY**

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**I.  
PURPOSE OF TESTIMONY**

The purpose of my direct testimony is to introduce and support the proposal of Southern California Gas Company (SoCalGas) and San Diego Gas & Electric Company (SDG&E) to use embedded cost principles for purposes of conducting gas cost allocation studies. My testimony is organized in five parts: (1) a discussion of cost allocation principles; (2) a discussion of the history and the benefits of gas utilities using economically efficient Long-Run Marginal Cost (LRMC) cost allocation methods to price utility services; (3) the application, by the Commission, of LRMC ratemaking over the past 10 years and the resulting deviation from efficient pricing principles; (4) a description of the benefits of using embedded cost methods over LRMC methods given the practical difficulties with the Commission's current use of LRMC; and, (5) a description of SoCalGas' and SDG&E's embedded cost allocation studies.

**II.  
COST ALLOCATION PRINCIPLES FOR RATEMAKING PURPOSES**

In evaluating any cost allocation methodology, the following defining characteristics are appropriate:

1. Recognition of cost causality
2. Results which are representative of the true costs of serving different types of customers
3. A sound rationale or theoretical basis for allocating costs
4. Stability of results over time

1                   5. Logical consistency and completeness

2                   6. Ease of implementation

3  
4                   The fundamental and underlying philosophy applicable to all cost studies for  
5 purposes of allocating costs to customer groups is the concept of cost causation. Cost  
6 causation seeks to determine which customer or group of customers causes the utility to  
7 incur particular types of costs. It is therefore necessary to establish a linkage between a  
8 utility's customers and the particular costs incurred by the utility in serving those  
9 customers. The essential element in the selection and development of a reasonable cost  
10 allocation methodology is the establishment of relationships between customer  
11 requirements, load profiles and usage characteristics, and the costs incurred by the utility  
12 in serving those requirements. In addition, when conducting a cost allocation study, the  
13 cost analyst should utilize a computational methodology that ensures the cost study will  
14 stand on its own objective merits. Therefore, a cost study's ability to properly reflect cost  
15 causation and the actual verifiable operational costs to serve customers of a gas utility  
16 should be the primary consideration in judging the reasonableness of its underlying  
17 computational methodology. A cost allocation study should not be influenced (i.e.,  
18 results driven) by any non-cost considerations that may be part of the rate setting process.  
19 Instead, to the extent it is appropriate to recognize non-cost considerations in setting a  
20 utility's gas rates, those considerations should be explicitly recognized outside the context  
21 of the cost allocation study by using the cost study results only as a guide.  
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**III.**

**LRMC VS. EMBEDDED COST ALLOCATION METHODOLOGIES**

1           The natural gas industry in the United States has spent considerable time and effort  
2  
3 over the years attempting to adapt marginal costing principles to the gas ratemaking  
4 process. Cost analysts and economists generally agree that marginal costing principles are  
5 based on well-established economic principles. From an economic efficiency and  
6 conceptual perspective, economists have articulated the benefits of marginal cost-based  
7 pricing in setting utility rates. SoCalGas has also articulated these benefits in several  
8 proceedings before the Commission. However, the real debate over the years associated  
9 with marginal cost-based pricing has not revolved around the underlying economic theory,  
10 but with its application in actually establishing LRMCs for ratemaking purposes. The  
11 most critical issue in applying marginal cost concepts to gas ratemaking is whether or not  
12 the benefits of using marginal costs are lost in the translation from theory to practice. This  
13 is exactly what happened in California. The Commission’s current application of LRMC  
14 has deviated far from the economic efficiency principle lauded by economists over the  
15 years and recognized, initially, by the Commission.

18           That basic economic efficiency principle is to use LRMC costs to set rates based  
19 on the marginal customer-related costs incurred to provide gas service to an additional  
20 customer, keeping demand constant, and the marginal demand-related costs of serving one  
21 unit of additional throughput, given a constant number of customers. Using this pricing  
22 methodology assures that customers receive the appropriate price signal to use gas service  
23 efficiently. Unfortunately, the Commission has deviated from this economic efficiency  
24 principle and has instead implemented LRMC-based rates that distort the cost signals  
25

1 given to customers that are the hallmark of the forward looking principles of a proper  
2 LRMC rate-setting methodology.

### 3 4 **1. The Evolution of LRMC in California**

5 To fully understand the current situation in California surrounding LRMC  
6 concepts, it is appropriate to first provide a brief chronological summary of the costing  
7 principles adopted by the Commission in conducting cost allocation studies for gas  
8 utilities. The desire on the part of the Commission to examine various gas cost allocation  
9 approaches was discussed in D.86-12-009. In that decision, the Commission indicated its  
10 theoretical preference for marginal cost. The Commission stated that it preferred a pricing  
11 methodology that was consistent with the new gas industry structure it had adopted, and  
12 that it wanted transportation services to be priced in a way that would enhance economic  
13 efficiency, meet the service needs of utility customers, and provide the utilities with a fair  
14 opportunity to earn their allowed rate of return.  
15

16 However, in D.86-12-009 the Commission adopted a “hybrid” form of embedded  
17 cost on an interim basis even though it had a theoretical preference for marginal cost.  
18 The hybrid nature of embedded costs was created by the Commission, “...by choosing  
19 “flatter,” less extreme allocation factors, which tend to spread costs more equally across  
20 the board to all market segments.” (D.86-12-009, mimeo at 24). The reliance on this  
21 form of embedded costs was done in recognition of the fact that adequate marginal cost  
22 studies and demand elasticity studies had not yet been developed as a basis for setting  
23 LRMC-based rates.  
24

25 Much debate occurred over the next six years in various venues before the  
26 Commission on the methodological and computational details of LRMC. In D.90-01-021,  
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28

1 the Commission stated its intentions to consider cost allocation and rate design issues in  
2 three phases: (1) determination of LRMC, (2) cost allocation, and (3) rate design policy  
3 issues. In D.90-07-055, the CPUC set final guidelines for estimating LRMC, with the  
4 intention of implementing the methodology in test year 1992 cost allocation proceedings.

5 In late 1992, in D.92-12-058, the Commission adopted an LRMC methodology for  
6 the three gas utilities – Pacific Gas & Electric Company (PG&E), SoCalGas, and SDG&E.  
7 All gas utilities were required to adopt the LRMC methodology for implementation by  
8 early 1993. In light of this expedited time schedule, the Commission stated that, “The  
9 next 1993 and 1994 BCAPs (following implementation) is the forum that best provides the  
10 three respondents an opportunity to update LRMC methodology.” (D.92-12-058, mimeo at  
11 63). Not surprisingly, the updating and fine-tuning of the gas utilities’ LRMC  
12 methodologies has dominated every SoCalGas and SDG&E BCAP proceeding since  
13 implementation of LRMC in 1993.

14 In early 1998, in R.98-01-011, the Commission anticipated further discussion on the  
15 appropriateness of LRMC policy and methodology as part of its rulemaking proceeding to  
16 assess the then current market and regulatory framework for California’s natural gas  
17 industry. In particular, as raised in the report prepared by the Commission’s Division of  
18 Strategic Planning entitled Strategies for Natural Gas Reform: Exploring Options for  
19 Converging Energy Markets, the Commission solicited comments from participants, asking  
20 them, “Do you agree with the report’s conclusion that, in the context of examining  
21 ratemaking regulation, the re-examination of the Commission’s Long Run Marginal Cost  
22 policy and methodology may be necessary...” More recently, the Commission closed the  
23 cost-benefit phase of the Natural Gas Strategy proceeding (I.99-07-003) with a decision  
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1 issued December 11, 2001 (D.01-12-018). The decision adopts the Comprehensive  
2 Settlement Agreement that includes settled revenue requirements for SoCalGas based on  
3 embedded costs for transmission and storage, and states, "We have no quibble with using  
4 an embedded cost method when unbundling," (D.01-12-018, p. 46). This outcome is  
5 similar to the outcome in the PG&E Gas Accord where PG&E's transmission and storage  
6 functions were unbundled based on embedded costs.

7 SoCalGas filed an implementation application (A.03-06-040) for D.01-12-018 on  
8 July 15, 2003, proposing to unbundled storage costs based on an embedded cost in  
9 compliance with the decision. That Firm Rights for California (FRCA) filing seeks to  
10 give customers firm access rights to SoCalGas' system, and withdraws storage and  
11 storage-related A&G and General Plant costs from base margin on an embedded cost  
12 basis.

## 14 **2. The Continuing Debate and Controversy Surrounding LRMC**

15 Since the inception of LRMC ratemaking for gas utilities in California, there has  
16 been an ongoing debate concerning the proper implementation of an economically  
17 efficient LRMC methodology. Controversial issues have included:

- 19 1) Development and details of utility resource plans;
- 20 2) Derivation of marginal customer costs using the rental method vs.  
21 the New Customer Only ("NCO") method; and,
- 22 3) The appropriateness of replacement cost adders.

23 The Commission has continuously acknowledged these issues, and the concerns  
24 they evoke. For example, in SoCalGas' 1997 BCAP decision, the Commission stated that:  
25 "In our review of the long-term resource plans submitted by each applicant in support of  
26 its LRMC proposal, we find serious concerns that go beyond the scope of this proceeding  
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1 to resolve.” (D.97-04-082, mimeo at 2). The Commission also stated that: “Fundamental  
2 questions regarding the validity of LRMC methodology and these additional issues will be  
3 examined as determined by a procedural roadmap issued following our upcoming Natural  
4 Gas Strategy.” (D.97-04-082, mimeo at 3). In SoCalGas’ 1997 BCAP decision, the  
5 Commission exhibited substantial frustration with the various problems related to the  
6 LRMC methodology for cost allocation purposes. In referring to previous BCAP  
7 proceedings of SoCalGas and PG&E, the Commission stated, “In both cases, we find  
8 application of LRMC methodology leads to more questions than answers.” (D.97-04-082,  
9 mimeo at 43). In a similar vein, the Commission agreed with the assessment of the Office  
10 of Ratepayer Advocates (“ORA”) regarding LRMC - “As a result of its participation in  
11 various proceedings, ORA has concluded that the implementation of a LRMC  
12 methodology which is consistent with the Commission’s goals remains a challenge. In  
13 concept, as described in textbook form, marginal cost sounds simple. Yet, in actual  
14 implementation and practice, marginal cost can be controversial and result in distorted  
15 price signals.” (D.97-04-082, mimeo at 43).

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18 The problems identified by the ORA in SoCalGas’ 1997 BCAP included: (1)  
19 forward-looking incremental cost approaches, (2) resource plans, (3) design criteria, and  
20 (4) methods for scaling of marginal cost revenues. The Commission acknowledged that  
21 addressing the deficiencies in the LRMC methodology identified by the ORA would  
22 require considerable Commission resources and a proceeding similar to a General Rate  
23 Case (GRC), not a BCAP. Although issues related to MDMs and scaling have been  
24 satisfactorily resolved, other issues have continued to be of concern to SoCalGas.  
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1 SoCalGas and SDG&E believe that the Commission's methodological evolution in  
2 its application of LRMC for cost allocation in BCAPs over the last 10 years has resulted in  
3 measures of cost that may no longer reasonably represent the true marginal costs of  
4 serving their customers. The following are examples of the Commission's deviation from  
5 established LRMC efficiency principles:

6 **(1) NCO Method.** In SoCalGas' most recent BCAP decision (D.00-04-060), the  
7 Commission's adoption of the NCO method of deriving marginal customer costs directly  
8 undermined appropriate LRMC pricing theory by not capturing the underlying cost to  
9 serve all customers and, thus, required a much larger "scaler" adjustment to compensate  
10 for the much lower "raw" LRMC cost levels. The NCO method does not give efficient  
11 price signals to customers considering new hookups because the approach ensures that  
12 they will never have to pay the full costs incurred to hook up to the utility's gas system.  
13 Other customers will always pick up the majority of those costs. This occurs because the  
14 NCO method takes the full cost per customer to hook up a new customer (not the  
15 annualized cost) and multiplies that value only by the average number of new customers  
16 to be added in that class. Therefore, this method (except where the growth rate of a  
17 customer class is very high) will significantly understate true marginal customer-related  
18 costs thereby artificially lowering core rates.

21 **(2) Replacement Cost Adders.** Similarly, the inclusion of replacement cost  
22 adders in the marginal cost computation effectively moves the resulting costs further away  
23 from true marginal costs. This occurs because the inclusion of replacement costs in the  
24 LRMC methodology result in the double counting of replacement costs. Through its use  
25 of Real Economic Carrying Charge (RECC) factors for annualizing the costs of plant  
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1 investment, the LRMC methodology already contains depreciation charges that account  
2 for the plant investment that is “used up” causing the need for eventual replacement.<sup>1</sup>

3 Because these replacement costs have already been accounted for, adding in a separate and  
4 explicit adjustment for distribution replacement costs double-counts these costs.

5 **(3) Resource Plans.** As part of LRMC ratemaking, transmission and storage  
6 expansion resource plans are a necessary element to determine forward looking rates for  
7 these services. SoCalGas has conducted extensive studies to plan for the economically  
8 efficient expansion of its transmission and storage systems. Consumer groups have  
9 claimed that they do not have the resources available to conduct equivalent resource plan  
10 studies. These groups have, therefore, introduced “proxies” for transmission and storage  
11 resource plans. The Commission has likewise adopted proxy resource plan costs in rates,  
12 although these proxies are not based on specific system requirements.

13  
14 **(4) Loss of Economic Efficiency.** Finally, in recognition of the above-stated  
15 challenges and deficiencies, there is a fundamental and overarching concern that gas rates,  
16 based on the LRMC methodology adopted by the Commission, will not further the goal of  
17 achieving economic efficiency for utilities providing gas transportation services in  
18 California. Economic efficiency requires that customers choosing to use gas face the cost  
19 implications of their decisions. In the examples just cited, the Commission’s  
20 modifications to LRMC methodology have distorted the cost allocations to customer  
21 classes and no longer promote economic efficiency. The resulting costs do not capture the  
22 proper costs that customers cause SoCalGas and SDG&E to incur to provide gas service.  
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26 <sup>1</sup> Note that this situation is not true in the case of customer costs estimated using the NCO method, which  
27 does not incorporate an RECC factor.

**IV.  
THE ADVANTAGES OF USING EMBEDDED COST METHODS VS. THE  
CURRENT MODIFIED LRMC COSTING APPROACH**

Given that the current application of LRMC by the Commission fails to meet economic efficiency goals envisioned by SoCalGas and SDG&E, it is more appropriate to return to the use of embedded cost allocation principles. There are many advantages to using embedded cost methods over the LRMC methodology as defined and practiced by the Commission. These advantages are presented in summary form below and are discussed in more detail later in my testimony.

1. Embedded costing provides an actual historical starting point – the utility’s total annual recorded costs.
2. By using historical costs less judgment is required to derive embedded costs by class of service.
3. Embedded costs are closely aligned with the utility’s total revenue requirement
4. A reasonably developed estimate of embedded cost will diverge less from true marginal cost than will the CPUC’s application of LRMC methodology.
5. Embedded costs require relative computational simplicity compared to LRMC.
6. The computation and development of embedded costs are more easily understood by all stakeholders than the computation and development of LRMCs.

The distinct advantage of using embedded cost for cost allocation purposes is that all the foregoing benefits are achievable without many of the problems caused by the Commission’s movement away from application of “true” LRMC. Use of embedded cost will decrease the time and resources required to scrutinize the cost allocation studies, and the debate regarding:

1. The derivation of customer-related costs;
2. Replacement cost adders; and,
3. The utility's long-range resource plans.

V.  
**AN EMBEDDED COSTING METHOD IS THE METHODOLOGY  
ADOPTED BY MOST REGULATORS IN OTHER PARTS OF THE U.S.**

Today, nearly all gas distribution utilities and pipelines in the United States utilize, and their regulators endorse, embedded costing principles for purposes of conducting cost allocation studies and setting interclass and intraclass revenue levels. The following sections describe the specific costing methods adopted by state's regulators.

**1. Gas Utility Costing Methods**

Expert industry research has shown that the majority of state and provincial regulators have adopted fully allocated or embedded costing principles for purposes of setting class revenue levels and rate structures within particular classes of service. In fact, for those states in the U.S. where gas marginal cost studies were conducted in the past (other than in California), many of the regulators in those states have now abandoned marginal cost concepts altogether.

In an industry-wide review conducted by Mr. Russell Feingold in late 1991 on behalf of SoCalGas, he observed that there were only eight states and the District of Columbia where some level of gas marginal cost activity existed. In some cases, gas marginal cost studies were required to be filed by the gas utilities in the state – in other cases these cost studies were filed at the discretion of the gas utility. In early 2002 Mr. Feingold updated his review and found that only five states remained where some type of

1 marginal cost study is still conducted – Massachusetts, Montana, New Hampshire,  
2 Oregon, and Vermont. In four of those five states, the gas utilities also file embedded  
3 cost allocation studies. The states of Connecticut, Illinois, and New York, and the  
4 District of Columbia, no longer require marginal cost studies.

5 Mr. Feingold found that LRMC studies have been abandoned for a few primary  
6 reasons. First, as the cost of gas decreased over time, there was less interest and concern  
7 over the need to provide gas customers with some type of price signal based on marginal  
8 cost to influence their gas consumption habits. Second, many of these states debated long  
9 and hard on how the theory of marginal costing should be put into practice, but were  
10 unable, like California, to find a reasonable methodological solution to this fundamental  
11 challenge. Finally, in states where both types of cost studies were conducted, the  
12 regulators recognized that the results of the marginal cost studies were similar  
13 directionally to the results already obtained under the embedded cost allocation studies.  
14 Therefore, they chose to rely solely upon the embedded cost allocation studies for  
15 purposes of setting gas rates, and eliminated the need to conduct marginal cost studies.  
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**VI.  
OVERVIEW OF SOCALGAS' AND SDG&E'S EMBEDDED COST  
ALLOCATION STUDIES**

**A. SoCalGas' and SDG&E's Cost Studies Demonstrate the Benefits of  
Conducting Embedded Cost Allocation Studies**

**1) SoCalGas' and SDG&E's embedded cost allocation studies  
provide an objective starting point by virtue of their direct  
reliance on total annual recorded costs.**

Embedded costing looks at the utility's actual expenditures and thereby takes into account both the planning and implementation processes and, therefore, provides a more verifiable starting point. For SoCalGas and SDG&E, the starting point for conducting their embedded cost allocation studies were the total annual recorded costs for calendar year 2002. These costs are presented in SoCalGas' and SDG&E's 2002 Annual Report to the CPUC (FERC Form 2). Using the FERC account structure to report these costs, a sufficient level of detail is provided so that one can readily examine the various plant-in-service, O&M expense, and A&G expense components that comprise SoCalGas' transmission and distribution base margin. Since these costs are recorded costs, they are objective and fully verifiable through review of SoCalGas' detailed accounting records. To the extent certain cost elements are not reflected in the 2002 Annual Report, they are derived from the data contained in previous SoCalGas proceedings where these cost elements were established (e.g., its GRC and PBR proceedings).

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1                                   **4)     The embedded cost results derived by SoCalGas and SDG&E**  
2                                   **should diverge less from actual marginal cost than results**  
3                                   **derived by the CPUC-prescribed costing methodology.**

4                   By definition, embedded costs reflect a utility's average costs. As a utility's  
5 marginal costs change, its average historical costs will tend to change in the same  
6 direction, albeit more slowly. Specifically, when marginal costs are below average  
7 historical costs, average costs are falling and when marginal costs are above average  
8 historical costs, average costs are rising. The relationship between demand and marginal  
9 costs is reflected in average costs. But average costs change less dramatically than  
10 marginal costs, so utility rates remain more stable (i.e., the allocation of embedded or  
11 average historical costs are less volatile from case to case).

12                   By virtue of the fact that historical costs track marginal costs in this manner,  
13 embedded costing methods ensure that this cost relationship is preserved in the utility's  
14 cost allocation studies. In contrast, because of the difficulties in estimating some  
15 marginal costs, it is unclear whether or not one can in fact capture the proper marginal cost  
16 characteristics of the utility. Certainly, the developmental history of the CPUC-adopted  
17 LRMC methodology suggests that proper LRMC remains uncertain. Since marginal costs  
18 are estimated (i.e., since changes in costs are based on forecasts and not changes in  
19 historical or observed actual embedded costs), the likelihood of marginal costs diverging  
20 from changes in actual cost results is greatly increased. SoCalGas' and SDG&E's  
21 embedded cost allocation studies are based on recorded historical costs from calendar year  
22 2002. Therefore, they exactly reflect the average historical costs for this time period.  
23  
24 And over time, their embedded cost allocation studies will track marginal costs as  
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1 described above by virtue of the fact that any changes in historical costs will be captured  
2 in subsequent embedded cost allocation studies.

3 **5) SoCalGas' and SDG&E's embedded cost allocation studies**  
4 **exhibit relative computational simplicity.**

5 Because marginal costs are estimates, they must be created, thus requiring a  
6 complex process that is premised upon numerous assumptions and analyses. Embedded  
7 costing does not create this problem because by definition the method is directly linked to  
8 historical or actual costs that are known and measurable. Validation is therefore much  
9 simpler using actual embedded costs. SoCalGas' and SDG&E's embedded cost allocations  
10 exhibit relative computational simplicity compared to their LRMC cost studies for two  
11 important reasons. First, the embedded cost studies do not contain the types of key  
12 assumptions required in their LRMC studies simply because the underlying costs are  
13 known with certainty. Second, the embedded cost allocation studies do not require  
14 complex forecasting techniques, including computer models and other analytical tools, to  
15 derive the starting point for the analysis – the total cost of service in 2002.  
16

17  
18 **6) It is expected that SoCalGas' and SDG&E's embedded cost**  
19 **allocation studies will be more easily understood by all**  
20 **stakeholders compared to its LRMC cost studies.**

21 Since embedded costing is premised upon the same cost information used to  
22 determine the utility's overall revenue requirement, there already exists a strong  
23 familiarity with the type and level of costs included in embedded cost allocation studies.  
24 Many of these advantages work directly towards streamlining the BCAP process by  
25 reducing the degree of controversy in the selection of the costing methodology and  
26 assumptions, minimizing the opportunity for biasing results, simplifying the  
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1 computational process, and enhancing the level of understanding of the underlying theory  
2 and methodology. The distinct advantage to using embedded cost is that all the foregoing  
3 benefits are achievable without many of the problems experienced in California associated  
4 with the use of LRMC as it has evolved at the CPUC over the last 10 years.

5  
6 **B. The Most Important Considerations in Conducting an Embedded Cost  
Allocation Study**

7 Before describing the specifics of SoCalGas' and SDG&E's embedded cost  
8 allocation studies, it is appropriate to briefly discuss the factors that can influence the  
9 overall cost allocation framework utilized by a utility and the guiding principles of cost  
10 allocation.  
11

12 **1. Factors Influencing the Cost Allocation Framework**

13 In undertaking a cost study, the overall framework within which a utility performs  
14 its cost study can be influenced by various factors. These factors include: (1) the  
15 physical configuration of the utility's gas system; (2) the availability of data within the  
16 utility; and, (3) the state regulatory policies and requirements applicable to the utility. By  
17 overall framework, I mean primarily the three standard steps or phases typically followed  
18 by a utility when performing a cost study – cost functionalization, cost classification, and  
19 cost allocation.  
20

21 The first step, functionalization, identifies and separates plant and expenses into  
22 specific categories, such as FERC Accounts, based on the various characteristics of utility  
23 operation. Classification of costs, the second step, further separates the functionalized  
24 plant and expenses into the major cost-defining characteristics of services rendered: (1)  
25 customer; (2) demand or capacity; and (3) commodity or energy. SoCalGas' and  
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1 SDG&E's embedded cost studies do not include commodity-related costs since these costs  
2 are not a part of base margin. The third step is the allocation of each functionalized and  
3 classified cost element to the individual customer class or rate class.

4 Costs typically are allocated on customer, demand or revenue-related allocation  
5 factors that are based upon various customer service or operational measures. The  
6 physical configuration of the utility's gas system requires consideration of factors such as:  
7 (1) distribution configurations; (2) mainline transmission pipeline functionality; and (3)  
8 system operating pressure configuration. This consideration includes determining  
9 whether: (1) the gas utility has an integrated transmission/distribution system or a  
10 distribution-only operation; and (2) the system operates under a multiple-pressure based or  
11 a single-pressure based configuration.  
12

13 With regard to data availability, the structure of the utility's books and records can  
14 influence the cost study framework. This structure relates to attributes such as level of  
15 detail, segregation of data by operating unit or geographic region, and types of load data  
16 available.  
17

## 18 **2. Guiding Principles of Cost Allocation**

19 The fundamental and underlying philosophy applicable to all cost studies is the  
20 concept of cost causation for purposes of allocating costs to customer groups.  
21 Specifically, the essential element in deriving reasonable cost of service allocation  
22 methods is the establishment of operating relationships between customer service  
23 requirements and the costs incurred by the utility in meeting those requirements. For  
24 example, providing a customer with gas service during peak periods can have much  
25 different cost implications for the utility compared to a customer who requires off-peak  
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1 gas service only. Additionally, as a general premise, a utility's operation and maintenance  
2 (O&M) expenses generally are thought to support the utility's corresponding plant in  
3 service accounts. The existence of the particular plant facilities necessitates the  
4 incurrence of cost (i.e., expenses) by the utility to operate and maintain those facilities. As  
5 a result, the allocation basis used to allocate a particular plant account often will be the  
6 same basis used to allocate the corresponding expense account, unless there exist more  
7 detailed field operating records that support a more discrete cost treatment based on the  
8 specific nature of the expenses (SoCalGas' detailed accounting and field records enable  
9 such treatment for a number of its expense categories).

10  
11 A utility establishes these cost and utility service relationships by analyzing its gas  
12 system design and operations, its accounting records, and its system and customer load  
13 data. From the results of those analyses, methods of direct assignment and "common"  
14 cost allocation methodologies can be chosen for all of the utility's plant and O&M  
15 expense elements. The term "direct assignment" relates to a specific identification and  
16 isolation of plant and/or expenses incurred exclusively to serve a specific customer or  
17 group of customers. Direct assignments best reflect the cost causative characteristics of  
18 serving individual customers or groups of customers. Therefore, in performing an  
19 allocated cost of service study, the cost analyst seeks to maximize the amount of plant and  
20 expense directly assigned to particular customer groups.

21  
22 Typically, however, only a portion of plant and expenses of a utility can be directly  
23 assigned. This is due to the nature of utility operations - there is a high degree of  
24 common or joint-use facilities and associated expenses. Out of necessity, then, to the  
25 extent a utility's plant and expenses cannot be directly assigned to discrete customer  
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1 groups, “common” allocation methods must be used allocate the remaining plant and  
2 expenses to the customer classes.

3 In conducting a cost allocation study, there exists a range of available cost  
4 allocation methods that the analyst should consider in determining the most reasonable  
5 basis for assigning costs to functions, cost classification categories, and classes of service.  
6 This range reflects the degree of: 1) precision and objectivity associated with each  
7 allocation basis; and 2) common or joint use nature associated with each cost element  
8 being allocated. These allocation bases include: (1) direct assignment; (2) special study;  
9 (3) compound allocation factor; and (4) generalized allocation factor.  
10

11 The concept of a direct assignment was just discussed. A special study consists of  
12 any detailed cost analysis where the various drivers of cost are reviewed in detail (e.g., at  
13 the sub-account level) to understand and establish the cost causative factors upon which  
14 such costs should be functionalized, classified, or allocated. For example, utilities  
15 typically conduct special studies to assign customer accounting functions (e.g., billing,  
16 records management, collection activities) to its various classes of service. This type of  
17 study would evaluate the various work tasks, and associated costs, of this activity in an  
18 effort to better assign cost responsibility to those customers that caused the utility to incur  
19 these costs. The ability to conduct special studies, and the degree of detail contained in  
20 such studies, often times is a function of the operational and cost data available to the  
21 utility, and the time available to conduct such studies.  
22

23 A compound allocation factor consists of two or more generalized allocation  
24 factors combined together in recognition of the multiple bases upon which a particular  
25 cost element should be assigned to the various functions, cost classification categories, or  
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1 classes of service contained in the cost study. This type of allocation factor recognizes  
2 that there is more than one cost driver that best captures the characteristics and activities  
3 of that cost element. The treatment of Administrative and General (A&G) expenses is a  
4 good example of this concept. Since these expenses are broad-based in nature and  
5 support a wide range of utility activities, the entire groupings of accounts, or certain  
6 specific accounts, are sometimes allocated on the basis of the combination of two or more  
7 generalized allocation factors. Portions of SoCalGas' and SDG&E's A&G expenses are  
8 treated in this manner, and will be discussed in further detail later in my testimony.  
9

10 A generalized allocation factor relies upon a broad measure of a utility's  
11 operational or service characteristics to capture the cost driver most closely associated  
12 with a particular cost element. Examples of this type of cost driver would be the number  
13 of customers, total plant-in-service, coincident peak demand, or total labor-related  
14 expenses. Choosing this type of allocation factor often occurs because the cost element  
15 being allocated is common to, or jointly-used by, multiple classes of service (or  
16 functions), or there is no precise way to assign costs to these groupings through detailed  
17 accounting records or other similar techniques. Although this type of allocation factor is  
18 more generalized compared to the other factors just discussed, it may represent the best  
19 available method, but one that may require significant judgment on the part of the cost  
20 analyst. That is why it is critically important for a utility conducting a cost allocation  
21 study to rely upon "subject matter experts" wherever feasible to provide those judgments  
22 based on their specific working knowledge of the utility's investment in facilities,  
23 operational activities, and service requirements of its customers. Ideally, these subject  
24 matter experts should be the individuals closest to the activities that cause the utility to  
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1 make its investments in facilities and to incur the costs to operate and maintain its gas  
2 system to provide service to its customers.

3 **C. SoCalGas' Embedded Cost Allocation Study**

4 **1. Study Approach**

5 SoCalGas relied on subject matter experts to thoroughly evaluate the various  
6 activities undertaken to serve its customers and to compile the detailed information  
7 required to form the basis for the functionalization, classification, and allocation of its  
8 authorized 2003 base margin. The studies conducted to analyze costs were highly  
9 detailed, comprehensive and thorough. While more detail alone does not ensure more  
10 accurate cost study results, SoCalGas chose to concentrate its efforts in areas where the  
11 added detail and time spent contributed in a disproportionately positive way to the end  
12 result. For example, SoCalGas conducted detailed special studies for many of the major  
13 plant accounts (e.g., Services and Meters) where the historical cost information was  
14 available to assign these facilities to specific customer types with a high degree of  
15 confidence, thus increasing the reasonableness of the cost studies' results. The same type  
16 of scrutiny was placed on the treatment of customer accounts expense (FERC Account  
17 Nos. 901 through 903 and 905). SoCalGas conducted detailed studies to identify the type  
18 and level of activities by customer for meter reading, customer billing and payment  
19 processing services, and credit and collection to determine the specific costs of providing  
20 these services to the customers that require them. Likewise, Customer Service and  
21 Information expenses were studied and assigned to the appropriate customer classes by  
22 special study.  
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1 SoCalGas' cost study exhibits a relatively high-level of computational detail where  
2 appropriate and supported by the availability of data. This is an important attribute of the  
3 SoCalGas' cost study in striving to achieve a reasonable representation of the true costs of  
4 serving its customers. SoCalGas' cost study provides a detailed "audit trail" enabling the  
5 tracing of cost elements throughout the various steps of the computational process.  
6 Finally, in certain functional cost categories, SoCalGas' embedded cost allocation study  
7 utilizes the same type and level of cost detail by activity for purposes of deriving cost  
8 allocation factors as in its current LRMC study.

## 9 **2. Embedded Cost Study Process**

10 This section discusses the particular process followed by SoCalGas in conducting  
11 its embedded cost allocation study filed in this proceeding. In addition, I highlight  
12 specific parts of the process where appropriate to illustrate the nature of the underlying  
13 analyses used by SoCalGas to derive the study results.  
14

### 15 **a) Cost Allocation Framework**

16 SoCalGas is the largest natural gas distribution utility in North America, with over  
17 2,700 miles of gas transmission lines and over 87,000 miles of gas distribution mains and  
18 services. The physical configuration of SoCalGas' gas system is fully integrated and  
19 consists of underground storage fields, a gas transmission system, and a gas distribution  
20 system that is composed of high and medium pressure systems. SoCalGas' gas  
21 distribution system redelivers gas supplies from its gas transmission systems to end-users  
22 served from its system.  
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24 SoCalGas has very detailed accounting records that facilitate the development of  
25 cost functionalization, classification, and allocation factors for use in its cost study that  
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1 reflect cost causation concepts. These records enabled SoCalGas to carefully evaluate the  
2 cost drivers associated with its various classes of service to closely relate the historical  
3 plant and expenses it incurs to serve customers to the specific customers or groups of  
4 customers causing such costs to be incurred. Finally, over the last 10 years, the CPUC  
5 has adopted certain principles to allocate demand-related costs to customer classes that  
6 provide guidance in certain respects for conducting embedded cost allocation studies. For  
7 example, the Marginal Demand Measures (MDMs) used in SoCalGas' LRMC cost study  
8 (e.g., cold-year peak day demand) can be used as the basis for the demand allocation  
9 factors relied upon in its embedded cost allocation study.  
10

11 **b) Cost Functionalization and Classification Processes**

12 The following major functional categories are included in SoCalGas' embedded  
13 cost allocation study: Customer-, Distribution-; Transmission-; and, Non-Energy  
14 Efficiency Customer Service and Information-related expenses. Within the Distribution  
15 function, there are sub-classifications of high pressure and medium pressure distribution.  
16 The two customer designated functions, (1) Customer-related and (2) Non-Energy  
17 Efficiency Customer Service and Information, are unique to SoCalGas and serve to  
18 facilitate the later steps of cost classification and allocation in the cost allocation study.  
19 SoCalGas combined the steps of cost functionalization and classification in the Customer-  
20 related cost category to simplify the cost allocation process. The functional category,  
21 Non-Energy Efficiency Customer Service and Information, treats the costs contained in  
22 FERC Account Nos. 907 to 910 as a unique grouping of costs. This was done because  
23 the Commission has historically preferred to examine these costs separately from other  
24 margin elements.  
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1 For utility plant-related costs, SoCalGas generally relied upon its subject matter  
2 experts to determine the most reasonable basis for functionalizing costs. In many cases,  
3 the detailed plant accounting records form the basis for completing this step. In some  
4 cases, a direct assignment of dedicated plant investment to a particular function was  
5 possible based on the specific nature of the investment. These methods are commonly  
6 used in conducting embedded cost allocation studies and provide a reasonable basis for  
7 functionalizing costs. For O&M expenses, SoCalGas analyzed costs by FERC account,  
8 and by sub-account, for purposes of functionalizing these expense elements. The  
9 analyses were guided in part by the manner in which SoCalGas functionalized its  
10 associated plant. Wherever possible, direct assignments to a particular function were  
11 made in a manner consistent with SoCalGas' treatment of plant. Then, based on a review  
12 of distribution costs, SoCalGas determined that in some cases, the use of installed footage  
13 (for each sub-function) was appropriate to functionalize the remaining O&M expenses.  
14 Inherent in this approach is that the unit O&M expense level is the same between sub-  
15 functions within a particular function (e.g., between high and medium pressure  
16 distribution). SoCalGas believes this approach is reasonable considering that certain field  
17 personnel are performing similar activities for service lines and distribution mains with the  
18 expenses recorded in the same account.  
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21 SoCalGas classified Customer Accounts and Non-Energy Efficiency Customer  
22 Service and Information expenses directly as customer-related costs. For A&G expenses,  
23 SoCalGas classified these costs across each of its functional categories using multiple  
24 factors that will be discussed in the next section of my testimony. SoCalGas' believes that  
25 its cost functionalization and classification processes are methodologically consistent  
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1 across all of the designated functional and cost classification categories and that all cost  
2 elements comprising SoCalGas' total base margin are functionalized and classified in its  
3 cost allocation study.

4 **(i) Classification of A&G Expenses**

5 The A&G expenses captured in FERC Account Nos. 920 through 935 represent  
6 costs incurred in support of the overall utility. This expense category includes a utility's  
7 general management salaries and associated costs, pensions and benefits, insurance  
8 expenses, and outside services acquired by the utility. As such, it often is not possible to  
9 directly assign A&G expenses to any one function because of its joint or common nature.  
10 The key objective, therefore, was to identify an allocation basis that closely reflects the  
11 factor(s) that cause the cost to be incurred by the utility. There are four generalized  
12 methods that an analyst can use to functionalize A&G expenses. These methods include:  
13

- 14 1) O&M Expenses (excluding gas costs) – applied to all A&G accounts
- 15 2) O&M Labor – applied to all A&G accounts
- 16 3) Generalized or compound allocation factors – applied to each A&G  
17 account based on the nature of the costs
- 18 4) "Efforts" study – detailed special studies that attempt to identify within  
19 each A&G account specific cost elements and their associated cost  
20 drivers

21 These allocation methods range from the most simplified basis using one broad-  
22 based allocation factor to the most complex basis using a detailed analysis of each activity  
23 or cost element contained in the particular account. The challenge for the cost analyst is  
24 to choose a method that balances the desire to reasonably capture the cost causative factors  
25 of each expense element with the amount of time and effort spent in analyzing the cost  
26 characteristics of each activity and cost element. Within the context of a utility's  
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1 embedded cost allocation study, a reasonable balance can be achieved by reviewing each  
2 FERC A&G Account to determine its major activities, and associated cost drivers, in an  
3 effort to derive a reasonable allocation basis for the expenses included in each account.  
4 This approach is identified as the third method presented above. SoCalGas reviewed each  
5 of the twelve A&G accounts and compiled details on the nature of the activities and  
6 related costs contained in each account. This detail enabled SoCalGas to derive a  
7 functionalization factor for each account based on the predominant cost element(s) in each  
8 account.

9  
10 For SoCalGas, there were four A&G accounts that contained roughly 80% of the  
11 total A&G expenses incurred by the utility in calendar year 2002. These accounts are:  
12 FERC Account No. 920 – Administrative and General Salaries; Account No. 923 –  
13 Outside Services Employed (corporate shared services); Account No. 926 – Employee  
14 Pensions and Benefits; and Account No. 931 –Rents. A focused review of these  
15 accounts, in particular, was warranted based on their size and the potential impact on the  
16 cost study results. For FERC Account No. 923, SoCalGas reviewed the activities and  
17 associated costs more closely in this account due to the magnitude of the total expenses  
18 and the wide range of activities contained therein. As described in detail in my direct  
19 Embedded Cost Study (ECS) testimony, SoCalGas conducted an analysis of each A&G  
20 account to identify the nature of the activities and related costs contained in each account.  
21 Based on this analysis, SoCalGas established a functionalization factor for each A&G  
22 account.  
23

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25 The classification of A&G expenses into customer-related, demand-related and  
26 Non-Energy Efficiency Customer Service and Information-related expenses is presented  
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1 in Table 17 of my ECS testimony. SoCalGas used three functionalization factors for  
2 A&G expense: Labor, Plant excluding General Plant, and a “Multi-Factor” comprised of  
3 the simple average of these three factors. The cost basis for these factors is presented in  
4 Tables 18 of my testimony. The “Labor” factor is based on the total functionalized labor  
5 costs as previously derived by SoCalGas in its cost allocation study. The “Plant” factor is  
6 based on the recorded net plant in service (excluding General Plant) as functionalized by  
7 SoCalGas. The Multi-Factor represents a compound allocation factor based on the simple  
8 arithmetic average of the previously derived functional factors for total O&M Expenses,  
9 Net Plant in Service, and Labor Expenses. Table 17 of my ECS testimony shows how  
10 these factors were applied to functionalize SoCalGas’ A&G expenses by account. For  
11 those accounts where it was determined that one cost driver predominated (e.g., FERC  
12 Account No. 924 – Property Insurance), a generalized factor was used (i.e., the Plant  
13 factor). For certain accounts where the costs spanned many activities and functions  
14 within the utility (e.g., FERC Account No. 925 – Injuries and Damages), the Multi-Factor  
15 was used. Once again, because of the broad characteristics of Account No. 923, a more  
16 detailed evaluation was conducted by activity to establish the bases for properly  
17 functionalizing these costs. Table 20 in my ECS testimony presents classification factors  
18 for the components of Account No. 923. SoCalGas believes that A&G expenses were  
19 classified on a reasonable basis in its embedded cost allocation study and that SoCalGas’  
20 efforts reflect an appropriate level of detail in capturing the most important cost causative  
21 characteristics of these expense elements.  
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**c. Cost Allocation Process**

The cost allocation process followed by SoCalGas consists of deriving an allocation factor for each of the functional and classified cost categories contained in the embedded cost allocation study. Table 2 in my ECS testimony provides the results of this process. The various allocation factors used by SoCalGas to allocate costs to its classes of service are shown on Table 29 in my ECS testimony. For each Function (spreadsheet row) contained in Table 29, the allocation basis chosen (under the Allocator Code column) is consistent with, and reflective of, the cost causative factors relied upon to functionalize and classify those same costs. SoCalGas chose allocation factors in a consistent manner to the factors it relied upon to functionalize and classify its distribution base margin. Each cost element contained in Table 29 is appropriate based on the general nature of the costs included and the most relevant cost causative characteristics. The basis for allocating each major cost element is summarized below:

**Customer-Related O&M Expenses**

- Distribution Operations Customer Services – number of dispatched field service orders;
- Distribution Operations Meter & House Regulators – unit meter cost times the number of meters by size;
- Distribution Operations Service Lines – service line footage by class;
- Customer Accounts – special study of the activities within this area by class.

**Customer-Related Capital Costs**

- Distribution Land, Structures & Improvements – distribution O&M expenses by class;
- Services – special study of investment by type, size, and footage by class;
- Meters and Customer Installations – special study of investment by type and size by class;

- GEMS – special study of the number and cost of GEMS equipment by class;
- Regulators – special study of types of regulators and their associated meter sizes;
- Gauges – number of above-standard pressure meters by class.

**Distribution-Related Costs**

- High Pressure – cold-year coincident peak month demand by class;
- Medium Pressure – cold-year peak day demand by class.
- Transmission-Related Costs - cold-year annual throughput by class.

**Customer Information & Service Expenses** – special study of the activities within this area by class.

The methods used in SoCalGas’ embedded cost allocation process to allocate costs to the classes of service are reasonable and reflective of the cost causative characteristics of the facilities and associated expenses of SoCalGas’ system.

**D. Reasonableness of SoCalGas’ Embedded Cost Allocation Study**

**1. Acceptability Considerations**

Overall, the embedded cost allocation study conducted by SoCalGas follows generally accepted costing methods used by gas utilities in other parts of the gas industry.

The methods employed by SoCalGas are consistent with cost causality principles in allocating costs to customer classes. Finally, SoCalGas believes it has exceeded the level of supporting accounting and operational detail normally seen when a gas utility conducts an embedded cost allocation study. This is entirely appropriate considering the relatively complex gas system operated by SoCalGas and the magnitude of its operations.

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**2. Reasonableness of the Costing Methodologies and Results**

SoCalGas' embedded cost allocation study made reasonable use of costing methodologies and results:

- The conceptual underpinnings and resulting methodologies upon which SoCalGas' embedded cost allocation study is conducted are well conceived, thorough, and reasonable in their treatment of costs.
- The costing methodologies utilized by SoCalGas in its embedded cost allocation study reasonably reflect cost causation principles.
- SoCalGas' embedded cost allocation study properly allocates its distribution and transmission base margin.
- The results of SoCalGas' embedded cost allocation study provide a reasonable and rational basis for the evaluation and setting of class revenue levels and rate structures.

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**E. SDG&E's Embedded Cost Allocation Study**

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**1. Study Approach**

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SDG&E relied on subject matter experts to evaluate the various major activities undertaken to serve its customers and to compile the detailed information required to form the basis for the functionalization, classification, and allocation of its 2003 base margin. This information supplemented SDG&E's existing knowledge of its gas utility operations and related cost characteristics gained from its ongoing efforts in preparing LRMC cost allocation studies. In addition, for certain areas SDG&E conducted special studies to assign costs to customer classes. For example, SDG&E conducted detailed studies to identify the type and level of activity by customer class for the Customer Accounts and Customer Services & Information FERC account expenses for both embedded and LRMC cost allocation.

1 For SDG&E, where detailed historical plant data was not readily available, it relied  
2 upon the combined utility knowledge and operating judgments of its subject matter  
3 experts to establish these cost causative characteristics. This approach is entirely  
4 appropriate and can reasonably satisfy the operational and cost support required to  
5 conduct an embedded cost allocation study.

## 6 **2. Specific Study Elements**

7 This section discusses the particular process followed by SDG&E in conducting its  
8 embedded cost allocation study filed in this proceeding. In addition, I address specific  
9 parts of the process where appropriate to illustrate the nature of the underlying analyses  
10 used by SDG&E to derive the study results.  
11

### 12 **a) Cost Allocation Framework**

13 SDG&E's gas system consists of approximately 200 miles of gas transmission  
14 mains, 7,213 miles of gas distribution mains, and 5,989 miles of distribution service lines.  
15 In addition, SDG&E operates a remote liquefied natural gas ("LNG") facility at Borrego  
16 Springs, California. Approximately 4.7% of the distribution mains are high-pressure  
17 operating at pressures ranging from 99 to 400 pounds per square inch gauge (psig). The  
18 remaining 6,872 miles are medium-pressure distribution mains operating at a pressure of  
19 60 psig.  
20

21 SDG&E has detailed accounting records in certain functional categories to  
22 facilitate the development of cost functionalization, classification, and allocation factors  
23 for use in its cost study that reflect cost causative concepts. Because of its relatively  
24 smaller-sized and more simplified gas system, the need for more detailed plant and  
25 operating cost data is not as great as for a larger-sized, more complex gas system such as  
26 the one operated by SoCalGas.  
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1 Finally, over the last 10 years, the CPUC has adopted certain principles to allocate  
2 demand-related costs to customer classes that provide guidance in certain respects for  
3 conducting embedded cost allocation studies. For example, the Marginal Demand  
4 Measures (“MDMs”) used in SDG&E’S LRMC cost study (e.g., cold-year peak day  
5 demand) can be used as the basis for the demand allocation factors relied upon in its  
6 embedded cost allocation study.

7 **b) Cost Functionalization and Classification Processes**

8 The following major functional categories are included in SDG&E’s embedded  
9 cost allocation study: Storage, Transmission, and Distribution. Within the Distribution  
10 function, there are sub-functions of high-pressure and medium-pressure distribution. For  
11 plant-related costs, where the FERC uniform system of accounts cannot provide sufficient  
12 guidance, SDG&E generally relies upon its subject matter experts who support each  
13 function to determine the most reasonable basis for classifying costs. For plant elements  
14 that can be characterized as “supporting” in nature (e.g., land, land rights, and structures),  
15 these cost elements generally are treated in a similar manner to the “primary” plant  
16 elements within each functional category.  
17

18 Regarding the category of Common Plant, SDG&E’s gas business receives an  
19 allocated portion of the Common Plant that supports its combined gas and electric  
20 operations. In many respects, the accounts contained within the Common Plant category  
21 are functionally equivalent to the accounts and related costs that SoCalGas (or any  
22 standalone gas utility) reflects in its General Plant category. Therefore, it is entirely  
23 appropriate for SDG&E to functionalize those costs in a similar manner to SoCalGas’  
24 proposed treatment of its General Plant accounts, which are functionalized on a labor  
25 basis.  
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1 For O&M expenses, SDG&E analyzed costs by FERC account, and by sub-  
2 account, for purposes of classifying these expense elements. The analyses were guided in  
3 part by the manner in which SDG&E functionalized its associated plant. Wherever  
4 possible, direct assignments to a particular function were made in a manner consistent  
5 with SDG&E's treatment of plant. Then, based on its review of distribution costs,  
6 SDG&E determined that in some cases, the use of installed footage (for each sub-  
7 function) was appropriate to classify the remaining O&M expenses. Inherent in this  
8 approach is the assumption that the unit O&M expense level is the same between sub-  
9 functions within a particular function (e.g., between high and medium pressure  
10 distribution). This approach is reasonable considering that certain field personnel are  
11 performing similar activities for service lines and distribution mains with the expenses  
12 recorded in the same account.

14 SDG&E functionalized as distribution-related and classified as customer-related  
15 the Customer Accounts Expense and Non-Energy Efficiency Customer Service &  
16 Information Expense categories. For A&G expenses, SDG&E classified these costs  
17 across each of its functional categories using multiple factors that will be discussed in the  
18 next section of my testimony.

20 The methods employed by SDG&E are methodologically consistent across all of  
21 the designated functional and cost classification categories and all cost elements  
22 comprising SDG&E's total base margin are properly functionalized and classified in its  
23 cost allocation study.

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**(i) Functionalization and Classification of A&G Expenses**

Generally, it is not possible to directly assign A&G expenses to any one function because the joint or common nature of the expenses. The key objective, therefore, is to identify an allocation basis that closely reflects the factor(s) that cause the cost to be incurred by the utility.

There are four generalized methods that an analyst can use to classify A&G expenses. These methods include:

- 1) O&M Expenses (excluding gas costs) – applied to all A&G accounts
- 2) O&M Labor – applied to all A&G accounts
- 3) Generalized or compound allocation factors – applied to each A&G account based on the nature of the costs
- 4) “Efforts” study – detailed special studies that attempt to identify within each A&G account specific cost elements and their associated cost drivers

These allocation methods range from the most simplified basis using one broad-based allocation factor to the most complex basis using a detailed analysis of each activity or cost element contained in the particular account. The challenge for the cost analyst is to choose a method that balances the desire to reasonably capture the cost causative factors of each expense element with the amount of time and effort spent in analyzing the cost characteristics of each activity and cost element. SDG&E’s embedded cost allocation study reviewed each FERC A&G account to determine its major activities and associated cost drivers in an effort to derive a reasonable allocation basis for the expenses included in each account. This approach is identified as the third method presented above.

1 SDG&E reviewed each A&G account (11 accounts) and compiled details on the  
2 nature of the activities and related costs contained in each account. This detail enabled  
3 SDG&E to derive a functionalization factor for each account based on the predominant  
4 cost element(s) in each account. For SDG&E, there were four A&G accounts that  
5 contained roughly 83 % of the total A&G expenses incurred by the utility in calendar year  
6 2002. These accounts are: FERC Account No. 921 – Office Supplies and Expenses  
7 (including corporate shared services), Account No. 923 – Outside Services Employed,  
8 Account No. 926 – Employee Pensions and Account No. 935 – Maintenance of General  
9 Plant. A focused review of these accounts, in particular, was warranted based on their  
10 size and the potential impact on the cost study results. For FERC Account No. 921,  
11 SDG&E reviewed the activities and associated costs more closely in this account due to  
12 the magnitude of the total expenses and the wide range of activities contained therein.  
13

14 As described in the direct testimony of SDG&E witness Ms. Lisa Davidson,  
15 SDG&E conducted an analysis of each A&G account to identify the nature of the  
16 activities and related costs contained in each account. Based on this analysis, SDG&E  
17 established a classification factor for each A&G account. SDG&E relies upon three  
18 classification factors for A&G expense: Labor, Plant, and Multi. The basis for these  
19 factors is presented in Table 4 of Ms. Davidson’s testimony. The “Labor” factor is based  
20 on the total functionalized labor costs as derived by SDG&E in its cost allocation study.  
21 The “Plant” factor is based on the recorded net plant in service as functionalized by  
22 SDG&E. The “Multi” factor represents a compound allocation factor based on the simple  
23 arithmetic average of the previously derived functional factors for total O&M Expenses,  
24 Net Plant in Service, and Labor Expenses.  
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1 For those accounts where it was determined that one cost driver predominated  
2 (e.g., FERC Account No. 924 – Property Insurance), a generalized factor was used (i.e.,  
3 the Plant factor). For certain accounts where the costs spanned many activities and  
4 functions within the utility (e.g., FERC Account No. 920 – A&G Salaries), a compound  
5 factor was used. Once again, because of the broad characteristics of Account No. 921, a  
6 more detailed evaluation was conducted by activity to establish the bases for properly  
7 classify and allocate these costs.

8 The A&G expenses were functionalized, classified and allocated on a reasonable  
9 basis in SDG&E’s embedded cost allocation study and SDG&E’s efforts reflect an  
10 appropriate level of detail in capturing the most important cost causative characteristics of  
11 these expense elements.

### 12 **c. Cost Allocation Process**

13 The cost allocation process followed by SDG&E consists of deriving an allocation  
14 factor for each of the functional and classified cost categories contained in its embedded  
15 cost allocation study. SDG&E witness Lisa Davidson provides details of this process.  
16 The various allocation factors used by SDG&E to allocate costs to its classes of service  
17 are discussed in Ms. Davidson’s testimony.

18 For each cost element contained in SDG&E’s embedded cost allocation study, the  
19 general nature of the costs included and the most relevant cost causative characteristics  
20 were identified and used in allocating costs. The basis for allocating each major cost  
21 element is summarized below:  
22  
23

#### 24 **Distribution – Demand**

25 -High Pressure: 1/35 peak day demand by class

26 -Medium-Pressure: 1/35 peak day demand by class

1            **Transmission – Demand** – cold-year coincident peak month demand by class

2            **Storage** - cold-year peak season volume – core market

3            **Customer – Related Distribution Expenses**

4            - O&M Mains and Services: plant in service for mains and services by class

5            - O&M Measurement & Regulators: unit MSA cost times the number of meters by  
6            size

7            - Customer Installations: special study of dollars spent on customer service orders  
8            by class

9            - Maintenance of Other Equipment: a portion directly assigned to the NGV class;  
10           remainder based on all other distribution maintenance expenses

11           - Supervisory and Engineering: all other distribution O&M expenses

12           - Customer Accounts, Service & Information: based on special studies of the  
13           activities within this area by class

14           **Customer – Related Distribution Capital Costs**

15           - Services: special study of investment by type and size by class

16           - Meters and Regulators: special study of investment by type and size by class

17           - Meter Installations: as per meter and regulator investment by class

18           - Industrial Regulators: as per meter investment for non-core classes

19           The methods used in SDG&E's embedded cost allocation process to allocate costs  
20           to the classes of service are proper and reflective of the cost causative characteristics of  
21           the facilities and associated expenses of SDG&E's system.

22           **F. Reasonableness of SDG&E'S Embedded Cost Allocation Study**

23                    **1. Acceptability Considerations**

24           Overall, the embedded cost allocation study conducted by SDG&E follows  
25           generally accepted costing methods used by gas utilities in other parts of the American gas  
26           industry. The methods employed by SDG&E are consistent with the industry standards  
27           that analysts rely upon in conducting embedded cost allocation studies for gas utilities and  
28

1 are supported by the general methods typically used by other cost analysts. Finally,  
2 SDG&E's supporting accounting and operational detail is consistent with what one would  
3 normally see when a gas utility of a similar size and complexity conducts an embedded  
4 cost allocation study.

5 **2. Reasonableness of the Costing Methodologies and Results**

6 SDG&E'S embedded cost allocation study used proper costing methodologies that  
7 yielded cost allocation results based on cost causality by various customer classes:

- 8 • The conceptual underpinnings and resulting methodologies upon which  
9 SDG&E's embedded cost allocation study is conducted are well-conceived,  
10 thorough, and reasonable in their treatment of costs.
- 11 • The costing methodologies utilized by SDG&E in its embedded cost  
12 allocation study reasonably reflect cost causation principles.
- 13 • SDG&E's embedded cost allocation study reasonably and fairly allocates  
14 its base margin.
- 15 • The results of SDG&E'S embedded cost allocation study provides a  
16 reasonable and rational basis for the evaluation and setting of class revenue  
17 levels and rate structures.

18 This concludes my prepared direct testimony.  
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## QUALIFICATIONS

My name is Herbert S. Emmrich. My business address is 555 West Fifth Street, Los Angeles, California 90013-1011. I am employed by Southern California Gas Company as Principal Regulatory Economic Advisor in the State Regulatory Affairs Department. I have been in this position since August 2002. I have previously testified before this Commission.

My academic and professional qualifications are as follows: I earned an undergraduate degree in Economics and Behavioral Sciences from California State University at Dominguez Hills in 1970 and a Master of Arts Degree in Economics from California State University at Long Beach in 1974. In addition, during the past 18 years, I held analyst and management positions in the Regulatory Affairs, Planning, Customer Services, Marketing, Gas Supply and Commercial and Industrial Services Departments of SoCalGas. My employment outside of SoCalGas has been in the areas of economics, environmental assessment, business planning and energy sector development. I held the positions of: Economist, Regional Economist and Environmental Assessment Manager at the U.S. Bureau of Land Management's Pacific Outer Continental Shelf Office, in Los Angeles, from 1975 to 1979; Economic Policy Supervisor and Issues and Policy Manager of Getty Oil Company from 1979 to 1984; and, Senior Energy Advisor of the U.S. Agency for International Development's Caucasus Office in Tbilisi, Republic of Georgia, from 1998 to 2002.