Application of SAN DIEGO GAS & ELECTRIC COMPANY (U 902 E) For Authority To Update Marginal Costs, Cost Allocation, And Electric Rate Design.

Application 11-10-002
Exhibit No.: (SDG&E-107-R)

SECOND REVISED PREPARED DIRECT TESTIMONY OF

ROBERT M. EHLERS

CHAPTER 7

ON BEHALF OF SAN DIEGO GAS & ELECTRIC COMPANY

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF CALIFORNIA

MARCH 30, 2012

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(CHAPTER 7)

I. OVERVIEW AND PURPOSE

The purpose of my opening testimony is to present San Diego Gas and Electric Company's (SDG&E) allocation and rate design proposals for street lighting.

Specifically, my testimony describes:

- The updated cost study for street lighting;
- Proposed revisions to distribution unit charges to reflect updated cost studies that will allow recovery of the allocated revenue requirement for street lighting, as presented in the testimony of William G. Saxe (Chapter 3);
- Proposal of a safety and security lighting rate; and
- Miscellaneous rate design and tariff revision proposals for street lighting.

The marginal cost methodology described in my testimony is consistent with the proposals described by Robert M. Ehlers (Chapter 6).

My testimony is organized as follows:

- **Section II – Lighting Cost Study:** Presentation of the results of a completed cost study which provides the basis for street lighting facilities and maintenance costs;
- **Section III – Lighting Rate Design Proposals:** Presentation of lighting rate design proposals that incorporate the Lighting Cost Study in Section II, along with distribution rate design proposals;
- **Section IV – 2009 RDW Compliance Requirements:** Propose a safety and security lighting rate in compliance with D.09-09-036;
- **Section V – Street Lighting Tariff Clean-Up Proposal:** Modification of certain special conditions for clarification on lighting rate schedule LS-1;
- **Section VI – Summary and Conclusion;**
- **Section VII – Statement of Qualifications.**

My testimony also contains the following attachment:

- **Attachment A – 2008 GRC Phase 2 Study Requirements:** Presentation of completed results for the study of transformers and service connections that should be used in the marginal customer cost calculation for the street lighting class.

II. LIGHTING COST STUDY

In this proceeding, SDG&E submits an updated distribution cost study for the lighting class. In addition, the lighting model presents recovery of the costs related to other components. SDG&E is not proposing any changes to non-distribution components. The lighting model is designed to recover the distribution revenue requirements allocated to the lighting class presented by Mr. Saxe. Model updates include the following items: facilities costs, maintenance costs, marginal distribution and customer costs, economic assumptions, billing determinants, lamp counts, pole counts, and forecasted sales.

Street lighting schedules are generally billed on a dollar per lamp, per month basis. Variations between rates and within schedules result from the following differences: lamp type (high pressure sodium vapor, low pressure sodium vapor, LED, etc.); lamp and ballast wattage; facilities ownership (LS-1 utility owned, LS-2 customer owned); level of maintenance, and other factors. Lighting rates reflect facilities, maintenance, demand, and customer costs. Facilities and maintenance charges are directly assigned to the lighting class, and therefore are excluded from revenue allocation, as described in the testimony of Mr. Saxe. Demand and customer costs are scaled to the street lighting revenue requirement using a street light multiplier.

Street lighting consists of six different schedules, each offering a distinctly different set of services.

- Schedule DWL: Residential Walkway Lighting;
- Schedule OL-1: Outdoor Area Lighting Service;
- Schedule OL-2: Outdoor Area Lighting Service Metered – Customer-Owned Installations;
- Schedule LS-1: Lighting – Street and Highway – Utility-Owned Installations;
- Schedule LS-2: Lighting – Street and Highway – Customer-Owned Installations;
- Schedule LS-3: Lighting – Street and Highway – Customer-Owned Installations; a schedule that provides metered lighting service and is closed to new customers.

Following are the cost study components updated for this cost study:

A. Facilities and Maintenance Costs

The lighting model was updated to reflect updated costs of lighting facilities and maintenance costs expressed in test year (TY) 2012 dollars. Street lighting facilities costs are calculated using the TY 2012 cost of facilities, multiplied by the RECC factor, to obtain the annual charges. Maintenance costs are calculated using a review of maintenance costs for the most recent recorded year, expressed in 2012 dollars and allocated by total number of lamps maintained. Both of these cost categories are then divided by twelve to obtain the per-month, per-lamp charge.

B. Distribution Demand and Customer Costs

The lighting model was updated to include distribution demand and distribution customer costs expressed in TY 2012 dollars. Distribution demand cost inputs are determined in the cost study supported by Mr. Ehlers. Street lighting distribution customer costs include the cost of the transformer and service, and are discussed in detail in Attachment A.

C. Other Updates

- Real Economic Carrying Charge (RECC) factors;
- Levelized Annual Capital Cost factors;
- San Diego franchise fee differential factors; and
- Lamp and Non-Standard Pole Counts.

III. LIGHTING RATE DESIGN PROPOSALS

The following rate design proposals for street lighting were developed using the lighting model most recently approved as part of the Settlement Agreement to SDG&E's 2009 Rate Design Window (RDW), which was approved by the California Public Utilities Commission (Commission) in Decision (D.) 09-09-036.

A. Distribution Rate Design Proposal

Street lighting distribution rates have been adjusted to recover the revenue allocated to the class by using an Equal Percent of Marginal Cost (EPMC) methodology as proposed by Mr. Saxe (Chapter 3). Unlike the other sectors, the schedules for street lighting are primarily based on a fixed monthly per-lamp charge (excluding Schedule LS-

3, which is closed to new customers, and Schedule OL-2, both of these rates are energy based). The distribution rate is based on three marginal cost components: (1) facilities, (2) maintenance, and (3) distribution and customer. The customer-owned facilities distribution rate is based on two marginal cost components: (1) maintenance (when a customer has contracted with SDG&E for maintenance services), and (2) distribution and customer.

SDG&E is also proposing changes to several lighting technologies and schedules.

1. Series Street Lighting

In this proceeding, SDG&E is proposing to calculate a separate rate for series street lighting customers. Historically, the lighting model has calculated the rate for all customers in a technology (i.e., High Pressure Sodium Vapor, Low Pressure Sodium Vapor) and then added a series surcharge for customers who have series street lighting. This method assigns a standard 25 KVA transformer as the basis for transformer costs and then adds in a separate surcharge for series lighting. This method does not allow the calculation of cost-based rates for series lighting customers. Providing a separate rate for customers with series lighting helps to demonstrate the cost differences that are specific to series street lighting and provides a rate that customers can easily understand.

SDG&E completed a cost study to determine the per-lamp costs of providing service for series street lighting. The differences between the costs for series lighting and non-series lighting pertains to the type of equipment which is specifically required for series street lighting. Instead of utilizing a standard 25 KVA transformer, series lighting requires a Regulated-Output (RO) Station transformer. The RO Station transformer is also called a constant-current transformer and its function is to adjust voltage to maintain a constant current for the series street lights. This type of transformer is not used for any other application. Therefore, the capital costs associated with this transformer should be directly assigned to the series lights. The capital cost for the RO station transformer is significantly greater than the cost for a standard 25 KVA transformer that would typically be used for non-series street lighting. In addition to greater capital costs, there are added operating and maintenance (O&M) costs associated with the RO Station transformer. One reason for this additional O&M

cost is that SDG&E may refurbish or repair, rather than replace, an RO Station transformer. This is because they are both difficult to obtain and because the capital costs associated with the purchase of an RO Station transformer are avoided in the case where the RO Station transformer can be refurbished or repaired. These additional O&M costs are directly applicable to the series street lights. Therefore, SDG&E proposes to separate the series lights from the standard street lights and apply a separate rate that will account properly for the additional facilities requirements associated with series street lighting.

2. Reactor Ballast Reduction Rates

In this proceeding, SDG&E is proposing a change to the lighting model that will provide a separate rate for customers whose lights use reactor ballasts. Historically, SDG&E calculated rates for mercury vapor (MV) and high pressure sodium vapor (HPSV) lights utilizing the wattage of the regulator-type ballast. Typically, the regulator ballast uses more wattage than the reactor ballast, which created the need for a reactor ballast credit. A customer with a light that used the reactor ballast would be billed with the rate calculated for the regulator ballast, and then a reactor ballast credit would be applied as a separate line item on the bill.

This proposed change provides a separate rate for the reactor ballast customer, and removes the need to calculate a separate reactor ballast credit. This change will not cause any difference in costs for customers, but will clarify the actual reactor ballast rate and will therefore remove the reactor ballast line item credit from the bill.

3. Residential Walkway Lighting (Schedule DWL) Applicability

The residential walkway lighting schedule is applicable to the lighting of walkways and similar common-interest areas of condominium, cooperative or other residential projects where each single-family accommodation is separately metered by the utility and the facilities can be installed in association with the utility's underground distribution system within the project. For this filing, SDG&E is proposing to update residential walkway lighting facilities charges using the facilities charge methodology that was used originally to calculate the DWL facilities charges. This method takes the Levelized Annual Capital Cost

(LACC) times the original cost of the walkway lighting installation. The result is an overall decrease to walkway lighting facilities charges.

The Schedule DWL minimum charge is designed to recover the cost of providing service for the DWL customer, including the transformer and service costs. In this proceeding, SDG&E is proposing to decrease the minimum charge for walkway lighting. This is due to the recalculation of customer costs based on the proposed change in methodology for the transformers and services calculation.

4. Schedule LS-3 Minimum Charge – (Schedule Closed 6/10/1979)

Schedule LS-3 is applicable to local, state or other governmental agencies for service for the lighting of streets, highways, and other public thoroughfares, and to corporate or governmental agencies for the lighting of non-dedicated streets alone or in conjunction with illuminated highway directional signs or aircraft warning obstruction lights. Schedule LS-3 has been closed to new customers since 6/10/1979. The minimum charge for Schedule LS-3 is designed to recover the costs of providing service for the LS-3 customer, including the transformer and service costs. The per customer costs for a lighting customer is calculated at $46.50 per month. In this proceeding, SDG&E is proposing to increase the minimum charge for Schedule LS-3 by 20% from the current minimum bill amount of $6.32 per month per customer, to the proposed minimum bill amount of $7.58 per customer. This increase is proposed to move towards more cost-based recovery of the customer cost portion of distribution revenues.

5. Schedule OL-2 Basic Service Fee

Schedule OL-2 is applicable to metered service of outdoor area lighting load for customer-owned facilities, controlled for dusk to dawn operation and used for the purpose of lighting sports and recreation areas. The basic service fee for Schedule OL-2 is designed to recover the costs of providing service for the OL-2 customer, including the transformer and service costs. The per customer costs for a lighting customer is calculated at $46.50 per month. In this proceeding, SDG&E is proposing to increase the basic service fee for Schedule OL-2 by 20% from the current basic service fee of $9.56 per month per customer, to the proposed basic service fee of $11.47 per customer. This increase is

proposed to move towards more cost-based recovery of the customer cost portion of distribution revenues.

IV. SAFETY AND SECURITY LIGHTING PROPOSAL

In the Settlement Agreement to SDG&E's 2009 Rate Design Window (RDW), which was approved by the California Public Utilities Commission (Commission) in Decision (D.) 09-09-036, ordering paragraph 5 states: "In its next application to establish marginal costs, allocate revenues, and design rates for service provided to its customers San Diego Gas & Electric Company shall prepare a complete and full cost allocation and rate design that includes an outdoor safety and security lighting proposal. This proposal shall include several options: a reasonable but minor allowance for incidental load controlled for dusk to dawn; a reasonable but minor allowance for incidental load not controlled for dusk to dawn operations; and a time of use rate option."

While the decision required SDG&E to perform a complete and full cost allocation and rate design, SDG&E does not have an identifier for these customers uniquely. In this proceeding, SDG&E proposes to expand applicability for the OL-2, and OL-TOU rates to include safety and security lighting customers.

The proposed Schedule OL-2 Applicability would read: "This is an optional schedule provided by the utility, applicable to metered service of outdoor area lighting load for customer-owned facilities, controlled for dusk to dawn operation and used for the purpose of lighting sports and recreation areas and for safety and security lighting."

The proposed Schedule OL-TOU Applicability would read: "This schedule is applicable to metered outdoor sports and recreation area lighting load and for safety and security lighting, not including street or highway lighting, controlled exclusively for nighttime operation. Incidental, non-outdoor area lighting load shall be served under this schedule if the incidental load meets the following conditions: 1) does not exceed 15 percent of the customer's Maximum Monthly Demand and 2) does not exceed 20 kW, regardless of the time such incidental load operates. Service under this schedule is not applicable to any customer whose monthly maximum demand is less than 20 kW and to any customer whose incidental load causes a summer on-peak demand that equals, exceeds, or is expected to equal or exceed 20 kW for three consecutive billing periods."

This proposal satisfies the Commission directive as follows:

- OL-2 provides a schedule that provides for a reasonable but minor allowance for incidental load controlled for dusk to dawn;
- OL-TOU provides a schedule that provides for a reasonable but minor allowance for incidental load not controlled for dusk to dawn operations; and
- OL-TOU provides a schedule that provides for a time of use rate option.

V. STREET LIGHTING TARIFF CLEAN UP PROPOSALS

SDG&E requests that special condition 1. a. (1) (a) in SDG&E Lighting Schedule LS-1 pertaining to Non-Standard Charges be deleted. These Special Conditions relate to Center Suspension lights and Non-Standard Pole charges. Center Suspension lights have been closed to new installations since June 10, 1979. There are no customers currently being billed for these lights. Non-Standard Pole charges are shown in the rate portion of the tariff.

VI. SUMMARY AND CONCLUSION

The street lighting rate changes are the result of various factors.

- Overall, the revenue requirement increase is due to the revenue allocation changes as discussed by Mr. Saxe. In addition;
- Schedule LS-1 increases are also related to the increase in the cost of facilities; and
- Schedule DWL decreases are due to the change in methodology for the calculation of facilities costs, and transformer and service costs, as discussed in Attachment A.

This concludes my revised prepared direct testimony.

VII. STATEMENT OF QUALIFICATIONS

My name is Robert M. Ehlers. My business address is 8330 Century Park Court, San Diego, California, 92123. I am a Principal Regulatory Economics Advisor in the Electric Rate Design Section of the Regulatory Policy and Analysis Group at SDG&E. My primary responsibilities include the development of electric cost-of-service studies, revenue allocation studies, and rate design development.

I received my Bachelor of Science degree in Business Administration with an emphasis in Accounting from San Diego State University. I have been employed by SDG&E since 1999. Since joining SDG&E I have acted as the Lead Planner for the Information Technology Division in SDG&E's 2004 Cost of Service application and the 2008 GRC Phase 1 and provided support for witnesses in those cases.

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ATTACHMENT A

2008 GRC PHASE 2 STUDY REQUIREMENTS

In the Settlement Agreement to SDG&E's 2008 General Rate Case Phase 2 (GRC), which was approved by the California Public Utilities Commission (Commission) in Decision (D.) 08-02-034, SDG&E was asked to conduct a study of the costs of transformers and service connections that should be used in the marginal customer cost calculation for the streetlight class.

The purpose of this study is to present the updated transformer and service connection costs for utilization in the SDG&E 2012 General Rate Case Phase 2 for streetlight calculations. Transformer, meter, and service (TSM) costs are the basis for distribution customer costs. For this study, cost estimates are developed for transformers based on size, type, and average number of street lights served per transformer. Cost estimates for service are developed based on the wire size, the number of runs, and the average service length. For street lighting, a typical transformer is assigned, up to 120 feet of 2-#8 wire per light for service is included, and no meter costs are assigned.

SDG&E has always included the transformer, pad, and pad installation in the transformer costs. The service costs include the cost of the secondary extension and the service extension. These costs are then apportioned by street light counts based on engineering estimates, and annualized using a Real Economic Carrying Charge (RECC).

A. Transformers

Historically, the per-lamp share of transformer costs have been calculated based on ninety-three 100-watt lights being served from a single 25 KVA transformer. This was based on the physical capability of the transformer to serve only street-lights. Based on an updated analysis of actual street lighting installations and energize orders, along with a review of actual lamp wattages served, a new method has been developed to apportion transformer costs to street lights. Based on the updated SDG&E lamp counts, the weighted-average lamp wattage is 135 watts. The review of actual energize orders show an average of 1.4 lights connected per 25 KVA transformer. This results in a lighting load of 189 watts or 0.189 KW per transformer (1.4 * 135 W = 189 W or .189 KW). Further analysis indicates that a 25 KVA single-phase station transformer which is 100% loaded is capable of providing a maximum of 22.5 KW. The total

transformer lighting load would be 0.189 KW / 22.5 = .0084 of the fully loaded KW of the transformer. On a per light basis the factor is: 0.0084 / 1.4 = 0.006. The fully-loaded and installed cost of a 25 KVA single station transformer and pad is $2,691.84 Therefore the escalated costs apportioned to rates should be $16.54 per lamp for transformers - $2,691.84 X .006 X 1.024 = $16.54. SDG&E recommends adoption of this methodology for the calculation of street-lighting transformer costs.

B. Secondary and Service Connections

Historically, the per-lamp share of secondary costs has been calculated based on a maximum of thirteen 100-watt lights being served from one leg of secondary. This method was based on the physical capacity of one leg of secondary to serve only street lights. Based on the updated analysis of actual street lighting installations and energize orders, along with the review of actual lamp wattages served, a new method has also been developed to apportion secondary costs to street lights. A project analysis indicates that on average, 1.75 lights are served per leg of secondary. This results in a lighting load of 236.25 watts per leg of secondary (1.75 X 135 W = 236.25 W or 0.236 KW). Also considered is the total KW load on a leg of secondary. Considering most customers will be served directly off the transformer, there would be about 3 customers at 7 KW each, or about 21 KW of load, using no diversification. This total secondary lighting load would be 0.236 KW / 21 KW = 0.11 KW per leg of secondary. On a per light basis, the factor is: 0.11 KW / 1.75 lights = 0.0063. The total installed cost for one leg of secondary is $829.14. Therefore the escalated costs apportioned to rates should be $829.14 X 0.0063 X 1.024 = $5.45 per lamp for secondary. SDG&E recommends adoption of this methodology for the calculation of street-lighting secondary costs.

No changes have been made for the methodology of calculating the service costs. Service costs are calculated based on Joint Settlement A.91-11-024. This decision used service cost times the product of the sum of utility owned lamps (LS-1, OL-1, and DWL) divided by the total number of lamps. This continues to be an appropriate methodology. On a per light basis the factor is 35,777 SDG&E Owned Lights / 154,334 Total Lights = 0.2318. The total installed cost per service is $230.08. Therefore the escalated cost apportioned to rates should be $230.08 X 0.2318 X 1.024 = $54.62 per lamp for service.

2008 GRC as Filed		2012 GRC as Proposed	
Transformer Total	**Secondary-Service Total**	**Transformer Total**	**Secondary-Service Total**
$1821	$1012	$2692	$1059
Per Lamp	**Per Lamp**	**Per Lamp**	**Per Lamp**
$19.58	$118.87	$16.54	$60.08

SDG&E recommends adoption of this methodology for calculation of street lighting secondary costs. The results of this cost study are incorporated and presented in the GRC Phase 2 street lighting model. Workpapers are available upon request.

SDG&E 2012 GRC Phase 2 Testimony Errata Log

Exhibit	Witness	Page	Line	Errata Item
Exhibit No. SDG&E-107	Robert M. Ehlers	RME-6	18-22	Updated customer cost per month and language for Schedule LS-3 to show 20% increase to Minimum Bill Charge.
Exhibit No. SDG&E-107	Robert M. Ehlers	RME-6 & RME-7	30-3	Updated customer cost per month and language for Schedule OL-2 to show 20% increase to Basic Service Fee.
Exhibit No. SDG&E-107	Robert M. Ehlers	RME-2-A	3-5	Updated transformer and pad cost which changes the escalated costs appropriated to rates.
Exhibit No. SDG&E-107	Robert M. Ehlers	RME-3-A	Table	Updated 2012 GRC as Proposed Transformer Total and Per Lamp figures.