

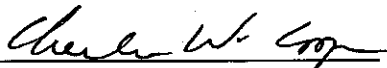
**METERING POLICY**

**SIERRA NEVADA REGION**

**GUIDES, REQUIREMENTS, INSTRUCTIONS, AND PROCEDURES**

**G.R.I.P. NO. 18**

**Approved for Publication and Distribution**



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## PREFACE

This document is issued by the Sierra Nevada Region (SNR) of the Western Area Power Administration (Western) and is designed to consolidate all SNR standard procedures regarding revenue metering. Procedures and guidelines are in accordance with the Power System Communications and Control Manual, General Power Contract Provisions (GPCP), and Customer contracts. Any corrections or comments concerning this guide may be addressed to N5000.

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METERING POLICY**

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**G.R.I.P. NUMBER 18  
SIERRA NEVADA REGION  
METERING POLICY**

1. **PURPOSE**

To establish policy on metering responsibilities and requirements in SNR.

2. **SCOPE**

This policy addresses metering responsibilities and requirements as they pertain to preference Customers. Project load metering responsibilities and requirements are defined in the Consolidated Operations and Maintenance Agreement (COMA) between SNR and the Bureau of Reclamation's (Reclamation) Mid-Pacific Region. Information is also included for non-preference and non-project customers.

3. **DEFINITIONS (As used herein):**

**Customer:** A preference or non-preference customer (also referred to as the Contractor in the GPCP) having a contractual relationship with Western.

**General Power Contract Provisions (GPCP):** Standard terms and conditions which are included in Western's contracts.

**Multiple Points of Delivery:** Where more than one Point of Delivery is used to serve a Customer. Each Point of Delivery requires a revenue metering system.

**Point of Delivery:** A connection on a Customer's electrical system at which the Customer receives power and amount of power received is measured.

**Special Conditions:** Those conditions where explicit guidance is not provided in the metering provisions of the GPCP.

**Split Delivery:** Where SNR and one or more other Supplier(s) deliver power at the same Point of Delivery to a Customer.

**Supplier:** Entity that sells power.

4. **AUTHORITY AND RESPONSIBILITY**

- a. Authority to set policy for metering requirements for Western is vested in the Administrator. Under certain conditions, exceptions to this policy may be granted. The Administrator may delegate authority to set policy under Special Conditions.
- b. The Regional Manager is responsible for implementation of Western's Metering Policy.
- c. All contractual documents related to metering will be signed by the Regional Manager. The Power Marketing Manager will be responsible for negotiating all

contractual issues regarding metering. The Maintenance Manager will provide cost and technical information to the Power Marketing Manager.

- d. The Maintenance Manager is responsible for all operation, maintenance, and repair of metering equipment and facilities.

## 5. **CONTRACTUAL REQUIREMENTS**

The GPCP attached to each Customer's contract state Western's contractual requirements for revenue metering. Although the GPCP version attached to each contract varies, the following excerpts from the July 10, 1998, version are typical.

### Multiple Points of Delivery

When electric service is supplied at or transmitted to two or more Points of Delivery under the same rate schedule, said rate schedule shall apply separately to the service supplied at or transmitted to each Point of Delivery; Provided, That where the meter readings are considered separately and, during abnormal conditions, the Contractor's system is interconnected between Points of Delivery such that duplication of metered power is possible, the meter readings at each affected Point of Delivery will be adjusted to compensate for duplication of power demand recorded by meters at alternate Points of Delivery due to abnormal conditions which are beyond the Contractor's control or temporary conditions caused by scheduled outages.

### Metering

The total electric capacity and energy supplied or transmitted under the contract will be measured by metering equipment to be furnished and maintained by Western, a designated representative of Western, or by the Contractor. The Contractor shall ensure that metering equipment furnished and maintained by the Contractor or another power Supplier, as provided in the contract, meets the metering standards of Western if such metering equipment will be used for billing or other accounting purposes by Western.

Meters shall be sealed and the seals shall be broken only upon occasions when the meters are to be inspected, tested, or adjusted, and representatives of the interested parties shall be afforded reasonable opportunity to be present upon such occasions. Metering equipment shall be inspected and tested each year by the party responsible for meter maintenance, unless another test interval is agreed upon by the parties. Meters shall also be tested at any reasonable time upon request by either party hereto, a supplemental power Supplier, transmission agent, or control area operator. Any metering equipment found to be damaged, defective, or inaccurate shall be repaired and readjusted or replaced by the party responsible for meter maintenance. Meters found with broken seals shall be tested for tampering and, if appropriate, meter readings shall be adjusted by Western pursuant to the article below.

Except as otherwise provided in the article below, should any meter that is needed by Western for billing or other accounting purposes fail to register accurately, the electric capacity and energy supplied or transmitted during such period of failure to register

accurately, shall, for billing purposes, be estimated by Western from the best available information.

If acceptable inspections and tests of a meter needed by Western for billing or other accounting purposes disclose an error exceeding two percent (2%), then correction based upon the inaccuracy found shall be made in the records of services furnished during the period that such inaccuracy existed as determined by Western; Provided, That if such period of inaccuracy cannot be determined, correction shall be made for the period beginning with the monthly billing period immediately preceding the billing period during which the test was done.

Any correction in billing resulting from a correction in meter records shall normally be made in the next monthly bill rendered by Western to the Contractor. Payment of such bill shall constitute full adjustment of any claim between the parties hereto arising out of inaccuracy of metering equipment.

## 6. SPECIAL CONDITIONS

- a. Split Deliveries - Meter Rental Charge: At Delivery Points where SNR and one or more other Suppliers(s) deliver capacity and energy, either directly or indirectly, meter rental charges are developed based on appropriate shares of metering equipment and service costs. At SNR owned-meters, the Customer shall be responsible for meter rental charges assessed for delivery of non-SNR capacity and energy<sup>1</sup>. Using methods specified in contractual agreements (Attachment A), the charge will be calculated based on the installed cost of the metering equipment, including maintenance, replacement, and meter reading, testing, and calibration costs. Attachment B provides an outline of typical costs included in developing meter rental charges. SNR will incur meter rental charges for any SNR capacity and energy metered through non-SNR-owned meters. The Customer receiving the power will be billed on a pass-through-cost basis for such charges.
- b. Multiple Points of Delivery: The terms established in paragraph 6.a apply to all Delivery Points used to serve a Customer, except as provided for in paragraph 6.e.
- c. Capacity and Energy Supplied by Others at Delivery Points Separate from SNR: SNR will not usually provide metering equipment or services for measuring capacity and energy supplied by others at Delivery Points separate from SNR=s Delivery Points. The Customer shall furnish metering specifications to SNR to ensure that metering services and equipment are compatible with SNR=s billing system. (Attachment B outlines metering services and equipment required for a typical Delivery Point.)

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<sup>1</sup>In the case of Customers receiving non-SNR capacity and energy from PG&E or NCPA, SNR bills PG&E or NCPA for meter rental charges as specified under Contract 2948A or Contract 59098.

- d. Capacity and Energy Supplied to SNR: SNR will generally be responsible for providing metering equipment (including repair and/or replacement) and service for capacity (co-generation, hydro, etc.) and associated energy that a Supplier delivers to SNR and/or impacts SNR's determination of the Customer's total demand.
- e. Capacity and Energy Supplied to a Third Party: Where SNR has sole responsibility in the determination of a Customer's total demand, and there is a third party within the Customer's area, then SNR will provide metering equipment and related services at the expense of the third party (e.g., small power producer within a Customer's service area selling output to the Customer or PG&E).
- f. Temporary Delivery Points: Where a Customer requires temporary deliveries (less than 5 years), all additional labor, equipment, and overhead costs shall be borne by the Customer. If the deliveries are planned for more than 5 years, and in fact fall short of 5 years, the Customer will reimburse SNR for all costs incurred for labor, equipment, and overhead. If the Delivery Point is planned as a temporary Delivery Point, and in fact is in service for more than 5 years, SNR will assume the ownership and cost of the revenue metering and related equipment but will not reimburse the Customer for associated expenses up to the 5 year date, except for a prorated cost of the equipment.
- g. Upgrading Delivery Points: When a Customer's Delivery Point is upgraded for load growth reasons SNR will provide only its prorated share of additional metering equipment and services for that portion of capacity and energy which is delivered by SNR. SNR will also provide its prorated share of additional metering equipment and services when a Customer upgrades a Delivery Point to improve energy conservation. If load growth not associated with preference power forces the replacement of instrument transformers, the Customer shall replace, or pay SNR to replace, the transformers.
- h. Auxiliary Metering Devices: Upon request, and as available, SNR will arrange to make available billing information and/or KYZ pulse readings from revenue metering equipment owned by SNR to the Customer. SNR may also provide 0-1 milliamp analog output provided the customer pays for the necessary equipment. Even though this information is provided to the Customer, SNR's revenue metering equipment will be the sole means of determination of the Customer's capacity and energy usage. Other arrangements shall prevail when the Customer's capacity and energy usage is fixed in accordance with Scheduling Contracts. Remote meter readings or access to SNR's instrument transformer secondaries will not be provided.
- i. Metering Services Requested by Non-Preference Agencies or for Non-Project Loads: SNR will provide the services on the basis of labor and material availability. The fees for the services are listed in Attachment C.
- j. Co-generation: Regardless of ownership issues, SNR will generally require data for the co-generation site directly from the revenue meters or magnetic tapes for after-

the-fact power billing (metered Customers) or for storage in historical meter files for the determination of 5-year actual average of Central Valley Project capacity and energy entitlement (scheduled Customers).

- k. Extra Metering "Sets" at a Single Point of Delivery: Costs for these facilities will be at the expense of the Customer.
- l. Losses: In general, meters will be located so as to measure all Customer losses. If some or all Customer losses cannot be directly measured, the Maintenance Manager will recommend an appropriate loss adjustment.

## 7. **EXISTING CONDITIONS**

This policy neither supersedes requirements or allowances recognized in existing contracts, nor does it require changes to existing installations. However, as situations permit, existing conditions and installations shall be changed to comply with these policies.

## 8. **METER TESTING, SECURITY, AND CORRECTION PROCEDURES**

For all capacity and energy metering that impacts SNR=s service to or from an entity, meter testing, security, and correction procedures will be patterned after metering provisions of the GPCP. In general, instrument transformer secondary circuits will be used only for revenue metering purposes and not for other purposes except as provided by and at the sole determination of SNR.

## 9. **REVENUE METER CHANGE PROCEDURES**

Sierra Nevada Region has the following procedures documentation for the notification and documentation of changes in metering locations or parameters.

Maintenance receives notification from contracts, Operations or customers of the need for a meter change, addition or removal. Maintenance notifies Power Billing, Operations and the MV-90 Administrator of the change being made. At the completion of work, documentation (Installation Summary and meter test report) of the change is provided to the Power Billing department, Operations, MV-90 Administrator and Maintenance retains a copy.

## 10. **ENGINEERING REQUIREMENTS**

- a. Current transformers used for revenue metering circuits must meet the accuracy standards, as specified under the American National Standards Institute (ANSI) C57.13, for an accuracy class of 0.3 percent at all burdens. The thermal current rating of current transformers shall exceed the maximum current capacity of the circuit involved by a factor of 1.5 to 2.0.
- b. Voltage transformers used for revenue metering circuits must meet the accuracy standards, as specified under ANSI C57.13, of 0.3 percent accuracy with the following burdens:

- i. AW@ through AY@ burden for 5 kV through 25 kV; and
  - ii. AW@ through AZZ@ burden for 25 kV and above.
- c. Revenue metering with a recording demand device shall be used if the estimated maximum demand is 500 kilovoltamperes or greater, or if maximum simultaneous demand billing is contractually required. Such revenue metering shall be compatible with the metering policy established by SNR. (Reference: General Requirements for Interconnection dated September 1999)

11. **OWNERSHIP**

SNR will normally have:

- a. Ownership of Customer demand measuring metering equipment.
- b. Responsibility for reading, testing, maintenance, and replacement when one half or more of the highest monthly demand of a Customer is provided by SNR or if such ownership and responsibility is economically advantageous to SNR.

In addition, SNR will usually have ownership and maintenance responsibility for metering equipment for those co-generation sites where the output is required to determine a Customer's total demand (i.e., a metered Customer as opposed to a scheduling Customer).

12. **METER RENTAL - FACILITY USE CHARGE**

The Customer shall be responsible for a facility use charge assessed for delivery of non-SNR capacity and energy through SNR-owned meters. This charge shall be based on the installed cost of the metering equipment, including maintenance, replacement, meter reading, testing, and calibration costs. SNR and the Customer shall enter into a contractual agreement which defines ownership, maintenance, payment responsibilities, etc. The attachments indicate how these costs might be calculated. Note: the actual numbers used in the computation attachments vary from time-to-time. SNR personnel labor rates should be verified as the calculations are performed.

## ATTACHMENT A

### METHODOLOGY FOR DEVELOPING METER RENTAL CHARGES UNDER PG&E CONTRACT 14-06-200-2948A AND NCPA AMENDMENT 1 TO CONTRACT DE-M065-85WP59098

Contract 2948A establishes a reciprocal agreement between PG&E and SNR to provide payment for metering equipment and services owned by each other and used to meter power deliveries to their respective customers. An entity is designated as the meter equipment and services owner if it supplies 50% of the capacity at a Delivery Point. Under the contract, PG&E pays SNR for its use of SNR's metering equipment and services based on a \$0.029 per kW-month charge applied to capacity supplied by PG&E above the Customer CRD. If a Customer's monthly peak demand does not exceed the Customer CRD, PG&E does not pay a portion of the metering charge for that month. Inversely, SNR incurs a \$0.030 kW-month charge for capacity supplied by SNR and metered through PG&E-owned metering facilities. The following example illustrates the application of these charges.

**Example:**

SNR-owned meter:

Customer peak demand = 15,000 kW

Customer contract rate of delivery (CRD) = 12,000 kW

SNR meter rental rate = \$0.029

Capacity supplied by PG&E = 15,000 kW - 12,000 kW = 3,000 kW

SNR charge to PG&E = 3,000 kW (\$0.029) = \$87

PG&E-owned meter:

Customer peak demand = 15,000 kW

Customer contract rate of delivery (CRD) = 12,000 kW

PG&E meter rental rate = \$0.030

Capacity supplied by SNR = 12,000 kW

Charge to SNR = 12,000 kW (\$0.030) = \$360

Similarly, Contract 59098, establishes a meter rental charge of \$0.029 kW-month to be paid by NCPA to SNR for capacity provided to NCPA Scheduling Cities<sup>2</sup> by NCPA above the SNR-supplied Customer CRD. The Customer CRD is subtracted from the total demand and the difference is multiplied by \$0.029 to determine that Scheduling City's charge for the month. If the demand is less than the CRD, then there is no charge to the Scheduling City for that month. The sum of all Scheduling Cities' charges are then totaled and billed to NCPA for that month's meter rental.

## ATTACHMENT B

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<sup>2</sup>The term A Scheduling Cities<sup>2</sup> is used to refer to NCPA members that schedule deliveries of other resources as well as deliveries of CVP power.

TYPICAL METERING SERVICE AND EQUIPMENT COSTS

Typical Costs (in dollars):					
	<u>12 kV</u>	<u>25 kV</u>	<u>60 kV</u>	<u>115 kV</u>	<u>230 kV</u>
1. Meter cabinet	700	700	700	700	700
2. KWH/kVAR meter	2,100	2,100	2,100	2,100	2,100
3. 3 each current transformers	1,560	7,875	14,950	21,500	35,100
4. 3 each potential transformers	2,210	10,857	13,455	22,750	40,950
5. Test switch	148	148	148	148	148
6. Isolation relay for K-Y-Z=s	162	162	162	162	162
7. Aluminum transformer bracket	293	293	/ <sup>3</sup>	/ <sup>3</sup>	/ <sup>3</sup>
8. Wood pole <sup>4</sup>	1,600	1,600	/ <sup>3</sup>	/ <sup>3</sup>	/ <sup>3</sup>
9. Primary fuse mount	145	145	/ <sup>5</sup>	/ <sup>5</sup>	/ <sup>5</sup>
10. Primary fuses	130	130	/ <sup>5</sup>	/ <sup>5</sup>	/ <sup>5</sup>
11. Misc. wire and connectors	125	125	125	125	125
<b>TOTAL EQUIPMENT COSTS</b>	<b>\$ 8,173</b>	<b>\$23,135</b>	<b>\$31,640</b>	<b>\$47,485</b>	<b>\$79,285</b>
12. Estimated labor cost	\$10,000 to \$15,000 - depending on overhead and location.				

Note: Combination metering units are approximately 10% less than individual instrument transformers and may be substituted. This would also require only 3 pedestals for mounting.

<sup>3</sup> Customer to furnish pedestal=s, conduit and telephone facilities.

<sup>4</sup> Includes site development, platforms, foundation, and where necessary, lightning arresters.

<sup>5</sup> Customer to furnish as necessary.

**ATTACHMENT B (continued)**

**TYPICAL METERING SERVICE AND EQUIPMENT COSTS  
FOR DELIVERY OF NON-SNR POWER**

Using the above total equipment costs for a 12-kV pole-top meter, an example of monthly metering charges is calculated below.

**Example:**

Developing Monthly Ownership Costs:

Equipment cost (12 kV):	\$ 8,173.00
Administrative Overhead (110%):	\$ 8,990.30

<b>Total Equipment Cost:</b>	<b>\$17,163.30</b>
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Equipment Rental Cost per Month (1.06% <sup>6</sup> of total cost):	\$181.93
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Meter Testing:

Annual meter testing: 1 hour

Semi-annual inspection: 1 hour

Travel: 60 miles one way

Labor: 2 hours @ \$70.00 per hour:	\$140.00
Mileage: 240 miles @ \$0.32 per mile:	\$ 76.80
Telephone charges: \$17.00 per month	<u>\$204.00</u>
	\$420.80

Total meter reading and testing costs per month (\$420.80/12): \$ 35.07

**Total metering charge per month: \$217.00**

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<sup>6</sup> Articles 28(b) (1), (2), and (3) of Contract 2948A determined the facility and metering charges. By Letter of Agreement dated January 28, 1983, SNR and PG&E established the monthly ownership cost percentages (used to determine monthly meter rental charges and monthly meter reading charges) at 1.06% of the Reproduction Costs New (RCN) for SNR furnished facilities and 1.4% of RCN for PG&E furnished facilities. The RCN represents the total equipment costs, including administrative overhead. These percentages are negotiated specifically for PG&E and Contract 2948A.

## ATTACHMENT C

### FEE SCHEDULE FOR SERVICES REQUESTED FOR NON-PREFERENCE OR NON-PROJECT LOADS

#### 1. **Predetermined Fees**

These fees represent costs of labor (including overhead) and material for such services. Actual costs and labor-hours may vary depending upon each Customer's situation. SNR reserves the right to amend the fees documented herein upon 30-days advance written notice.

##### 1.1 **Meter Rental**

This fee shall be the monthly replacement cost of the value of the installed meter and associated equipment amortized over a 10-year lifetime of such meter and equipment at the applicable interest rate for repayment.

##### 1.2 **Meter Translation**

The monthly fee for translation of meter data for billing purposes shall be the value of 1.5 labor-hours labor cost at SNR's current fiscal year rate. (This results in a current meter translation charge of \$100.00 per month.)

##### 1.3 **Meter Testing and Operation and Maintenance (O&M)**

The fee for meter testing and O&M shall be the value per actual man-hour at the C&I craftsman labor rate. (The labor rate, when adjusted for administrative and general expenses, is \$70.00 per hour.)

#### 2. **CONTRACTUALLY DETERMINED FEES**

Due to the anticipated wide variance in specific requirements for the services provided under this section, the fees established hereunder shall be determined on a case-by-case basis, pursuant to individual contracts for the services to be rendered.

#### 3. **METER INSTALLATION**

The fee for meter installation shall be a one time fee, payable in advance. The fee shall be based on the actual costs of labor and material. The critical factors affecting the costs will be:

- X Meter location on the high versus low side of the transformer.
- X Voltage to be metered.