



Asset Type: **Gas**

Date Issued/Updated: **May 2008**

Function: **Billing, Estimating, Maintenance,  
Mapping, Operation, and Planning**

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**Title: Therm Billing Procedures**

## **Overview**

This work procedure describes the responsibilities and detailed steps for Pacific Gas and Electric Company's (the Company's) therm billing process.

The heat content of gas, measured in British thermal units (Btu), varies over time and by location. For this reason, more than 200 therm billing areas, or *Btu Areas*, exist within the Company service territory. For each Btu Area, a single sample point measures the gas at regular intervals to ensure accurate customer bills.

This work procedure describes department responsibilities and key operational steps of the Company's gas therm billing procedures. Procedures include changing or retiring Btu Areas and collecting valid data required by the Company's billing system, Customer Care and Billing (CC&B).

## **Governing Document**

[Utility Standard S4300, "Gas Measurement Requirements"](#)

## **Safety**

To ensure safety while performing gas measurement work, employees must follow all applicable precautions and requirements outlined in the following documents:

- [Utility Standard Practice \(USP\) 22, "Safety and Health Program"](#)
- [Code of Safe Practices](#)

## Therm Billing Procedures

### 1. Responsibilities

The director for each department listed below is responsible for the following therm billing tasks:

#### A. Gas Transmission and Distribution (GT&D) – Gas System Operations (GSO)

GT&D – GSO is responsible for the following tasks:

- Establishes Btu Areas to cover all of the Company's natural gas customers.
- Approves additions, deletions, and changes to the Btu Areas.
- Maintains a database listing all sample points and Btu Area descriptions.
- Decides when to use alternate sample points for Btu Areas to compensate for changes in the routing of gas flows or specific sampling problems.
- Communicates heating value measurements to Customer Service Revenue Systems – Business Systems and Application Requirements (CSRS BSAR), Metering Services, and other organizations, as requested. Sends heating value measurements from the Btu data management system to the Company's billing system via electronic file, as described in [Section 3, "Collecting, Validating, and Transmitting Btu Area Data to CC&B,"](#) on Page 5.
- Maintains records of the following heating value measurements and selected gas composition data for 3 years: average nitrogen, carbon dioxide, and specific gravity data for selected Btu Areas for high-pressure customer meter configurations, as needed.
- Ensures that heating value measurements and selected gas composition data records are available to field measurement employees.
- Develops and implements controls to comply with the requirements listed above.

#### B. Gas Transmission and Distribution (GT&D) – Gas Engineering

GT&D – Gas Engineering is responsible for the following tasks:

- Specifies Company gas sampling and heating-value measurement equipment.
- Posts Btu valves and sample points on gas transmission operating maps and diagrams.
- Maintains a transmission system therm-billing map showing all active Btu Areas.
- Develops and implements controls to facilitate compliance with the requirements listed above and for the procedures described in [Section 3, "Collecting, Validating, and Transmitting Btu Area Data to CC&B,"](#) on Page 5.

- Works with all stakeholders to establish and maintain Btu Area boundaries for all gas customers.
- Coordinates and notifies Btu Area changes with the appropriate departments and personnel. For example, area senior distribution engineers (SDEs), CSRS BSAR, local meter reading supervisors, local mapping supervisors, and division billing analysts (DBAs), as detailed in [Section 2, "Changing or Retiring a Btu Area,"](#) on Page 4.
- Develops and implements controls to facilitate compliance with the requirements listed above.

### **C. Customer Service Revenue Systems – Business Systems and Application Requirements (CSRS BSAR)**

CSRS BSAR is responsible for the following tasks:

- Provides support to stakeholders (e.g., GSO) to maintain necessary therm billing system requirements, when requested.
- When notified by Gas Engineering department representatives of revisions to Btu Area boundaries, works with the representatives to implement the changes of the Btu Areas to the billing systems and customer accounts, as detailed in [Section 2, "Changing or Retiring a Btu Area,"](#) on Page 4.
- Maintains necessary controls to comply with Btu Area change requirements.
- Facilitates changes to CC&B soft tables to establish new Btu Areas or deactivate Btu Areas.

### **D. Mapping**

Mapping maintains maps of Btu Area boundaries within the distribution system and provides copies as needed.

### **E. Area Maintenance and Construction (M&C)**

M&C is responsible for the following tasks:

- Samples and analyzes the gas at each sampling point and reports heating-value measurements to the GSO director.
- Installs and maintains approved gas sampling and heating-value measurement equipment.
- Maintains and ensures proper tagging of Btu valves.

**F. Gas Transmission M&C**

Gas Transmission M&C maintains transmission tap valves.

**G. Estimating and Service Planning (SP)**

Estimating and SP are responsible for the following tasks:

- Completes [Form F5449-03-1, "Premises and Service Point Setup,"](#) with the correct Btu Area.
- Enters the information from [Form F5449-03-1](#) into CC&B.

**H. Division Billing Analyst (DBA)**

DBAs are responsible for the following tasks:

- Communicates to appropriate departments – Advanced Billing System (ABS), Gas Billing, and Service and Sales – when Btu Area changes go into effect.
- Coordinates any necessary billing adjustment efforts and consults with Tariffs and Compliance (T&C) as needed.

**2. Changing or Retiring a Btu Area****A. Changing a Btu Area**

Table 1 below lists key action items required to change a Btu Area. [Form F4300-14-3, "Btu Area Change Checklist,"](#) includes detailed action items and provides a record of completion dates.

**Table 1. Btu Area Change: Action Item Summary**

| Lead Responsibility | Action Item   |
|---------------------|---|
| Sr. Gas Engineer    | Preliminary communication email to GSO, BSAR, MR, and DBA.  |
| GSO                 | Establish new Btu Area in Btu Data Management.<br><b>Note:</b> Complete at least 2 months before Btu Area change Target Date.   |
| GSO                 | Issue Service Request (SR) to create new Btu Area codes in CC&B soft table.<br><b>Note:</b> Request SR 6–8 weeks before Btu Area change. ABS will get the new Btu Area from CC&B through the CC&B/ABS (IF58) interface. |
| CSRS – BSAR         | Issue SR requesting MT update for Btu Area changes in CC&B.   |
| BRC – DBA           | Set up meeting with SDE, GM, and MR to prepare for Btu Area change.   |
| Sr. Gas Engineer    | Complete notification form and email to Department Contacts. See <a href="#">Table 2, "Department Contacts,"</a> on Page 5.   |

**B. Retiring a Btu Area**

[Form F4300-14-4, "Btu Area Retirement Checklist"](#) details action items and provides a record of completion dates.

**C. Sending Notifications**

One of the last checklist items is to complete the appropriate notification form: [F4300-14-1, "Btu Area Change Notification,"](#) or [F4300-14-2, "Btu Area Retirement Notification."](#) At least 2 months before the Target Date, send the completed notification form to the contacts in Table 2 below.

**Table 2: Department Contacts**

| Department  | Contact(s)                            |
|---|---------------------------------------|
| Senior Gas Engineer (SGE)                                     | (cc: Mark Aloiau)                     |
| GSO – Gas Control   | Keith Slibsager<br>(cc: Jack Dunlap)  |
| Gas Measurement / Gas Quality                                 | Kimberly Kemp<br>(cc: Joe Bronner)    |
| CSRS – BSAR   | Lisa Lo<br>(cc: Denise Alexander)     |
| Billing, Revenue and Credit – DBA                             | (cc: Ken Greminger)                   |
| Transmission and Regulation (T&R)                             | (cc: M&C Supt.)                       |
| Gas Mapping (GM)  | (cc: Mapping manager)                 |
| Meter Reading (MR)  | (cc: MR supervisor)                   |
| Billing, Revenue and Credit – ABS Gas Billing Solutions (GBS) | Robert Larkrith<br>(cc: Walter Moore) |
| Billing, Revenue and Credit – ABS                             | Joan Ngo<br>(cc:Tong Ni)              |
| CC&B  | Thien Thanh Phan                      |

**3. Collecting, Validating, and Transmitting Btu Area Data to CC&B**

**Note:** The Btu Application is a module of the Gas Transaction System (GTS). For details, see the [Gas Therm Billing \(BTU\) Training Manual](#).

**A. Responsibilities**

- M&C collects, analyzes, and reports weekly and monthly gas samples.
- GSO performs the following tasks:

- Retrieves daily gas samples collected and transmitted via gas Supervisory Control and Data Acquisition (SCADA).
- Reviews and validates gas sample data in the Btu Application.
- Assigns gas sample points to Btu Areas.
- Provides average nitrogen, carbon dioxide, specific gravity, and Btu data for customer meter calibrations.
- Gas Engineering reviews the assignment of gas sample points to Btu areas for compliance with the Btu accuracy requirements.
- Gas Engineering initiates reviews and tracks status and action plans, and analyzes the impacts of alternate gas sources.

### **B. Weekly and Semiannual Gas Sampling**

- 1) Collect and transport samples per [Work Procedure WP4300-18, "Sampling Natural Gas."](#)
- 2) Store and analyze gas samples per [WP4300-18](#), using approved gas chromatographs currently maintained in accordance with [Work Procedure WP4300-15, "Daniel Gas Chromatographs – Required Maintenance and Calibration."](#)
- 3) Print and file gas chromatograph reports with the full analysis of each sample by the Gas Sample Point number and the Active Week date, in descending order.
- 4) Retain the printed gas chromatograph reports for a minimum of 3 years at the gas chromatograph site or a designated field headquarters near the gas chromatograph site.
- 5) In the Btu Application, enter the Btu, specific gravity, nitrogen, and carbon dioxide values from the printed gas chromatograph report before the close of business on the Wednesday after the Active Week, per the [Gas Therm Billing \(BTU\) Training Manual](#).
- 6) If the sample is not available, provide an estimated value or contact a Gas Control transmission coordinator and arrange for Gas Control to enter an estimated value later.

### **C. Retrieving Daily Gas Samples Transmitted via Gas SCADA**

- 1) Every day, when feasible, the gas chromatograph transmits 24-hour trend data to the Btu Application. The data transmission path usually includes the Gas SCADA system and various servers.
- 2) After establishing a new data point or after changing data-identification information, test and validate data transmission to the Btu Application.
- 3) In addition to the initial testing and validation, review and validate the daily and weekly averages as described in the following Section 3.D, "Reviewing and Validating Gas Sample Data in the Btu Application" below.

**D. Reviewing and Validating Gas Sample Data in the Btu Application**

- 1) Review, validate, and, when necessary, estimate the data contained in the Btu application for the current Active Week. For details, see the [Gas Therm Billing \(BTU\) Training Manual](#).
- 2) Verify that there are review comments for each sample point with estimated data or exceptions reported on the 800 Report.
- 3) Complete the review and validation process by 6 a.m. on the Monday 8 days after the Active Week date. If it is a Company holiday, the following day is acceptable.
- 4) Configure the Btu Application to transmit data to CC&B by 1 p.m. on Monday, 8 days after the Active Week date. If it is a Company holiday, the following day is acceptable. If data will not be transmitted on time, contact the CC&B group to let them know when it will arrive.

**E. Assigning Gas Sample Points to Btu Areas**

- 1) Assign gas sample points to Btu Areas so that the reported values for Btu, specific gravity, nitrogen, and carbon dioxide meet the criteria established in [Utility Standard S4300, "Gas Measurement Requirements."](#)
- 2) Review the 801 Report to verify that gas sample points are assigned to the proper Btu Areas. Alternatively, review the assignments in the Btu Application on the Therm Billing Area screen.
- 3) Assign gas sample points to Btu Areas so that a complete historical record of assignments is maintained in the Btu Application. For details, see the [Gas Therm Billing \(BTU\) Training Manual](#).

**F. Providing Average Nitrogen, Carbon Dioxide, Specific Gravity, and Btu Data for Customer Meter Calibrations**

- 1) In the Btu Application, review the weekly average values for nitrogen, carbon dioxide, specific gravity, and Btu for consistency and accuracy.
- 2) Ensure that field measurement personnel have access to this data, organized by Btu area, for the previous 12 months.

**Note:** Options for providing data access include direct application connectivity, for example via Citrix; indirectly, via printed reports; etc. Currently, field personnel access data using the [BTU Data Retrieval Tool \(BTUDataRetrievaltool.xls\)](#), located on the [GSO SharePoint site](#).

#### 4. Reviewing Gas Sample Point to Btu Areas Compliance

Audit each Btu Area to ensure standards compliance and that the transmission system is supplying uniform heating values to each Btu Area. Review the following items:

- Sampling equipment.
- Transmission system Btu Area boundaries.
- Sample point locations.
- Sample point database.
- Maintain a list of complex gas supply situations, such as where floating null points may exist.
- Once a year, review complex Btu Areas to ensure compliance with [Utility Standard S4300, "Gas Measurement Requirements."](#)
- If the annual review suggests that alternate gas sources are causing the overall accuracy of Btu measurements to be out of compliance with [Utility Standard S4300](#), develop an action plan to mitigate the problem.

#### Definition of Terms

**ABS:** Advanced Billing System.

**Active week date:** The Sunday at the end of the period during which samples were collected. Usually the data is entered on a Thursday or Friday following the Active Week date. This is because the samples are collected over the days leading up to the end of the Active Week date, and they are then retrieved, analyzed, and entered into the BTU Application during the following week.

**BRC:** Billing Revenue and Credit.

**Btu:** British thermal unit.

**CC&B:** Customer Care and Billing.

**Complex Btu Area:** A Btu Area that has alternate sources of supply that are not of the same gas composition as the primary source of supply, and delivery from the alternate sources has a greater than negligible probability.

**CSRS-BSAR:** Customer Service Revenue Systems – Business Systems and Application Requirements.

**DBA:** Division Billing Analyst.



**GSO:** Gas System Operations.

**GT&D:** Gas Transmission and Distribution.

**M&C:** Maintenance and Construction.

**SCADA:** Supervisory Control and Data Acquisition.

**SDE:** Senior distribution engineer.

**SGE:** Senior gas engineer.

**SP:** Service Planning.

**SR:** Service Request.

**TBA:** Therm billing area.

**Recision**

This document cancels and supersedes Work Procedure WP4300-14, "Therm Billing Procedures," dated October 2007.

**Reference Documents**

[BTU Data Retrieval Tool \(BTUDataRetrievaltool.xls\)](#)

[California Public Utilities Commission \(CPUC\) General Order 58-A, "Standards for Gas Service in the State of California"](#)

[CPUC General Order 58-B, "Heating Value Measurement Standard for Gaseous Fuels"](#)

[Code of Safe Practices, "Basic Safety Requirements," Sections 1-3, 13, and 15](#)

[Form F5449-03-1, "Premises and Service Point Setup"](#)

[Gas Rule 17, "Meter Tests and Adjustment of Bills for Meter Error"](#)

[Gas Therm Billing \(BTU\) Training Manual](#)

[GSO SharePoint site](#)

[Utility Operations Policy 3-1, "Billing and Revenue Collection"](#)

[Utility Standard S4300, "Gas Measurement Requirements"](#)

[Utility Standard Practice \(USP 22\), "Safety and Health Program"](#)

[Work Procedure WP4300-15, "Daniel Gas Chromatographs – Required Maintenance and Calibration"](#)

[Work Procedure WP4300-17, "Gas Chromatographs – Calibration Gas"](#)

[Work Procedure WP4300-18, "Sampling Natural Gas"](#)

- Attachments**
- [Form F4300-14-1, "Btu Area Change Notification"](#)
  - [Form F4300-14-2, "Btu Area Retirement Notification"](#)
  - [Form F4300-14-3, "Btu Area Change Checklist"](#)
  - [Form F4300-14-4, "Btu Area Retirement Checklist"](#)

**Contact for More Information** [Redacted]

**Date Issued** May 2008

**Approved by** [Redacted]  
Principal Engineer  
[Redacted]

**Revision History**

| Chg No. | Date         | Description  | By (LAN ID) |
|---------|--------------|--|-------------|
| N/A     | April 2007   | Initial release based on the Responsibilities section of UO Standard S4301.  | [Redacted]  |
| 01      | October 2007 | Revised some responsibilities, added procedure detail, added forms. Other minor updates for clarity and consistency. | [Redacted]  |
| 02      | March 2008   | Revised some text and added to definition of terms.  | [Redacted]  |

