

# California Metering Exchange Protocol

*Version 1.10 – Second Release – Includes updated Loss Factor information*

*September 18, 1997*

## Purpose

The California Metering Exchange Protocol is intended for use in transmitting gas and electric utility metering, billing, and administrative information between companies. Communications between customers and Utility Distribution Company (UDC), Electric Service Providers (ESP), Metering Agents (MA) and Billing Agents (BA) must be supported. This protocol has been developed to support the business activities needed to allow utility customers to choose among multiple Service Providers (SP) which may be commercially independent from their Utility Distribution Company (UDC). This direct access process was mandated to be in operation on January 1, 1998. No alternative protocol was available for implementation and inter-company testing in 1997.

## Specific Business Objectives

- 1. Meet the January 1, 1998 implementation deadline.** It should be acknowledged that several parallel processes are in place and progressing to meet the same business needs as this protocol. Among them are the utility industry Utilities Communications Architecture group, the group developing the ANSI standard Document Communications Infrastructure (DCI) document types, and the California utility companies and SP coordination committee. None of these alternatives will be ready in the required time frame.
- 2. Provide a simple to implement, workable, and reliable protocol to support business communications between metering agencies, SPs, and billing agencies.** This protocol must be easy to implement and use. It will be used on multiple machine types and it will be implemented in multiple programming languages. It must solve immediate business needs without adding complexity. It must contain features that provide assurance that communications errors can easily be detected.
- 3. Provide an inexpensive to implement protocol that may comfortably be abandoned.** Utility restructuring is occurring at a pace that is much beyond the capabilities of standards bodies to respond. This protocol is intended for interim use while standards bodies are producing an appropriate replacement.

*Note: Documents Change History appears at end of document.*

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## Implementation Overview

This protocol is a compromise between reality and what might be ideal. The set of features that make up a good communications protocol has continuously evolved. Protocols designed today are free flowing, flexible, and extensible. Modern programming tools tend to support this new style of communications protocols. A well-known example of this new style protocol is the Hypertext Transfer Protocol (HTTP) commonly used in Internet communications.

Though the California Metering Exchange Protocol is new, it is constrained by a necessity to be supportable with computer systems and programming languages that are far from modern. However, simply finding a "lowest common denominator" set of communications features is problematic. Older systems tend to rely on rigidly structured, fixed field length, fixed record length protocols. This rigidity tends to limit the adaptability of a protocol. Fixed length fields and records often embody significant wasted transmission bandwidth since individual fields must be sized to contain the largest possible entry for them.

The compromise chose for the California Metering Exchange Protocol is to use fixed record formats with variable length fields. This approach provides relative ease in mapping communications data formats to traditional fixed format records while allowing some of the communications bandwidth savings of the modern protocol style. It does not provide all of the flexibility and adaptability inherent in the modern style.

The California Metering Exchange Protocol data content consists of multiple lines of ASCII text, each terminated with ASCII Carriage Return and Line Feed characters. Only a very small number of different line types are used. Each line begins with type name and type version fields to allow correct interpretation of its contents. Individual fields on a line are separated with the ASCII Comma character. Fields are packed tightly, with leading and trailing blank space removed. Empty fields are carried as simply a single comma.

The text lines that make up the California Metering Exchange Protocol are designed to support both block mode and continuous stream data transmission methods. Block mode transmission normally consists of placing multiple text lines in a file or communications buffer, and transmitting that file or buffer as a single unit. Continuous stream data transmission simply transmits text lines, one after the other, with no identifiable beginning or end to the sequence. Supporting both modes in the same protocol is only slightly more difficult than providing a robust version of either.

## Specific Protocol Features

There is a simple set of features or rules embodied in the California Metering Exchange Protocol:

1. Data content is a sequence of ASCII text lines terminated with ASCII Carriage Return and Line Feed characters.
2. Each line is a complete record.
3. No line shall exceed a total length of 2048 characters including end of line Carriage Return and Line Feed. This limit is imposed to simplify and clarify implementation issues.
4. Each record stands alone as an atomic entity. This is a context free protocol.
5. Each record consists of a series of variable length fields; each delimited with the ASCII Comma character.
6. Field text that contains the ASCII comma character is enclosed between ASCII Quotation marks at the field boundaries.
7. No single field shall exceed a total length of 256 characters including any delimiting characters. This limit is imposed to simplify and clarify implementation issues.
8. Field contents are packed. Leading and trailing white space is removed when records are sent and ignored when received. If leading or trailing white space itself is significant, the field must be enclosed between ASCII Quotation marks at the field boundaries.
9. Empty or unused fields are indicated with a single ASCII Comma character.
10. Each record begins with a consistent set of fields, called a header, to facilitate identification and interpretation.
11. Each record ends with an optional CRC field which lies between the last supplied comma in the record and the terminating Carriage Return and Line Feed characters. The CRC type is CRC-16. When supplied, this field is encoded as a hexadecimal integer totaling 5 characters in length, including the leading ASCII 'H' character. When not supplied, the CRC field is left empty.
12. Records may be truncated at any field after the header. Those fields not supplied are assumed to be empty. When records are truncated, the CRC field is still assumed to lie between the last actually supplied comma and the terminating Carriage Return, Line Feed characters.
13. Field text may contain one of the following data types: Numeric Integer, Numeric Floating-Point, a calendar Date, Time, a Date/Time, a Time Interval, Arbitrary Text, or a predefined Protocol Text entry.
14. Numeric values are encoded as ASCII text. Two kinds of numeric values are provided: Integer and Floating-Point. Integer values are encoded in decimal with optional leading Plus (+) or Minus (-) signs or in hexadecimal. Hexadecimal values are indicated by a leading ASCII character 'H'. Floating-Point values may be encoded as simple integers, with trailing decimal point and one or more decimal digits, or scientific notation of the form. For example: [ + ] [ - ] 9.9E [ + ] [ - ] 9 where "[ + ] [ - ]" means an optional plus or minus sign, "9" means one or more decimal digits, and "E" means one of the following characters 'E', 'e', 'D', or 'd'. Floating-Point values, however, must be limited to a specific range. Though they may be encoded in scientific notation, floating point numbers will be converted to "+-9999999999.99999" form by PG&E for internal use. Numeric fields may not exceed 16 characters in length. Empty numeric fields are interpreted as the value zero.

15. Time and Date values are encoded as ASCII text. Date only fields are encoded as “CCYYMMDD”. Time fields are encoded as “HHMM”. Date/Time fields are encoded as “CCYYMMDDHHMM”. Empty Date and Date/Time fields are undefined except where explicitly handled.
16. Time Interval values are encoded as ASCII text. They are encoded “MMDDHHMM”. Empty Time Interval fields are interpreted as zero intervals. Interval values of less than an hour must repeat on the hour. Interval values of less than a day must repeat at midnight.
17. Arbitrary Text fields contain free-form text such as customer name and address information. Empty text fields are interpreted as blank.
18. Protocol Text fields contain values that are predefined and have a limited set of possible values. They are used as data type indicators and as qualifiers or feature flags. Predefined text values are chosen so as to make their meanings easily inferred by someone familiar with the technology they describe. Empty text fields are interpreted as blank. Protocol Text fields may not exceed 12 characters in length, not counting the delimiting comma. This limit is imposed to simplify and clarify implementation issues.

## **Record Types**

There are five categories of inter-company transactions that must be supported for direct access:

1. End Use Customer Administration
2. Metering Service
3. Billing Service
4. Distribution Loss Factors
5. Equipment Configuration

Separating communications into these categories simplifies the job of identifying communications purpose and content. Record types and their use are discussed in detail below.

## **Header Fields**

All records in the California Metering Exchange Protocol begin with a consistent set of fields. They are the Record Type and Record Version fields. The supported sets of Record Types are:

1. “MEPAD01” – Administrative Data Type 1 – DASR
2. “MEPAD02” – Administrative Data Type 2 – Credit Data
3. “MEPMD01” – Metering Data Type 1 – Interval Data
4. “MEPMD02” – Metering Data Type 2 – TOU Data
5. “MEPBD01” – Billing Data Type 1 – Billed Dollars
6. “MPEBD02” – Billing Data Type 2 – Interval Pricing Plan

7. "MEPBD03" – Billing Data Type 3 – TOU Pricing Plan
8. "MEPLF01" – Distribution Loss Factors – Electric
9. "MEPEC01" – Equipment Configuration Type 1

The Record Version field is a Data field, as described above in "Specific Protocol Features," that contains the data that this specific record format was defined. This version number changes only when interpreting as some other version would produce invalid results.

## **Time Value**

Time is not a trivial concern. Many problems occur if time and date are not handled properly. Customers may be billed incorrectly. Usage statistics may be invalidated. The changes to and from daylight savings time confuse billing algorithms. Companies will be dealing with customers in multiple time zones. A single, standard approach to handling time and date is necessary.

The California Metering Exchange Protocol records and transmits all information using the international standard, Universal Coordinated Time (UTC). UTC, for the purposes of this document, is simply Greenwich Mean Time (GMT) without daylight savings time correction. UTC is an internationally recognized time representation and is actually used internally in nearly all of our modern computer systems, including desktop PCs.

Meter readings, administrative operations, and billing transactions are all reported in UTC. Some accounting billing is based upon time-of-day which is normally defined in terms of local time. For those accounts, conversion from UTC to local time must be performed. Each meter's configuration information includes time zone descriptions for both standard and daylight savings time. Time values must be corrected to local time for billing purposes by adding the appropriate time zone value to the UTC value, taking into account crossing day and month boundaries.

The California Metering Exchange Protocol time calculations may appear complex and obscure to people who are unfamiliar with the internal operation of modern computer systems. The algorithms to perform these operations are both simple and well known. Converting time values from UTC to local time and back is so common that most people take these operations for granted, not realizing that it is even taking place. This protocol simply utilizes UTC for its intended purpose.

## Protocol Text

Protocol Text values are predefined text strings. Their use allows constant and reliable parameter identification. Their use also provides boundaries to the range of values that may be used in fields. Most Protocol Text values are defined in the description of the fields to which they apply. One particular kind of Protocol Text value common to multiple fields is listed here for convenience:

### UNITS

- **"KWHREG"** – Meter dial or register readings for printing on monthly bill.
- **"KVAHREG"** – Meter dial or register readings for printing on monthly bill.
- **"KVARHREG"** – Meter dial or register readings for printing on monthly bill.
- **"GASREG"** – Meter dial or register readings for printing on monthly bill.
- **"PULSE"** – Direct meter pulse readings.
- **"KW"** – Kilowatt demand, usually expressed as peak value in time interval.
- **"KVA"** – Kilovolt-ampere demand, usually expressed as peak value in time interval.
- **"KVAR"** – Kilovolt-Ampere-Reactive demand, usually expressed as peak value in time interval. Values may be positive or negative depending upon power factor. Values are positive for VARs produced by customer or negative for VARs consumed by customer. Induction motors consume watts and VARs. A condenser bank produces VARs. An over-excited generator produces watts and VARs. An under-excited generator produces watts and consumes VARs.
- **"KWH"** – Kilowatt hours used.
- **"KVAH"** – Kilovolt-ampere hours.
- **"KVARH"** – Kilovolt-Ampere-Reactive hours. Values may be positive or negative depending upon power factor. See KVAR above for further notes.
- **"GKW"** – Kilowatt generation, received from customer, usually expressed as peak value in time interval. Used when customer is generating power.
- **"GKVA"** – Kilovolt-Ampere-Reactive generation received from customer, usually expressed as peak value in time interval. Used when customer is generating power. Values may be positive or negative depending upon power factor. See KVAR above for further notes.
- **"GKWH"** – Kilowatt hours received from customer. Used when customer is generating power.
- **"GKVARH"** – Kilovolt-Ampere-Reactive hours received from customer. Used when customer is generating power. Values may be positive or negative depending upon power factor. See KVAR above for further notes.
- **"VOLTS"** – Volts.

- **"BTU"** – British Thermal Units.
- **"THERM"** – Therms.
- **"GAL"** – Gallons.
- **"CF"** – Cubic Feet.
- **"CCF"** – Hundreds of Cubic Feet.
- **"MCF"** – Thousands of Cubic Feet.
- **"ACFT"** – Acre-Feet.
- **"LBS"** – Pounds.
- **"\$"** – US Dollars.

## Administrative Data Records

California Metering Exchange Protocol administration communications occur to establish logical linkages between SPs and customers. Linkages between customers and Utility distribution companies (UDC), Electric Service Providers (ESP), Metering Agents (MA) and Billing Agents (BA) must be supported. They also allow agencies to notify other agencies of changes in metering account status. The transactions in this category are:

- (Customer to UDC) establish/break direct access with SP.
- (SP to UDC) establish/break direct access with customer.
- (UDC to Customer) acknowledge success or failure of access request.
- (UDC to SP) acknowledge success or failure of access request.
- (SP to UDC) request resend of account information.
- (UDC to SP) resend account information.
- (UDC to SP) notify of shutoff or turn-on of service.
- (MA to UDC/ESP) notify of metering configuration change.
- (MA TO UDC/ESP) notify of metering change out.
- (UDC to SP) notify of tax or fee category change.

The above transactions are all performed using the single administrative record type "MEPAD01". These are commonly referred to as Direct Access Service Requests (DASR). In all cases, the assumed ownership of record data is with the metering agent. Customer, UDC, and SP requests need contain data in only those fields necessary to define what change is requested. MA transmissions contain the entire record contents as it currently exists.

The "MEPAD02" Record is provided to transmit customer credit data.

### **"MEPAD01" – Administrative Data Type 1 – DASR**

The sequence of fields in this record is:

- I. **Record Type:** *Protocol Text:* Always **"MEPAD01"**
- II. **Record Version:** *Date ("CCYYMMDD"):* Currently **"19970912"**

- III. **Sender ID:** *Arbitrary Text:* Identity of the entity sending this record. It will typically be an abbreviation of the sender's company name. Currently, only the first 16 characters of this field will be recognized by PG&E.
- IV. **Sender Customer ID:** *Arbitrary Text:* This is the senders identification reference for the account to which this record applies. Currently, only the first 12 characters of this field will be recognized by PG&E, 13 by SCE.
- V. **Receiver ID:** *Arbitrary Text:* Identity of the intended recipient entity of this record. It will typically be an abbreviation of the receiver's company name. Currently, only the first 16 characters of this field will be recognized by PG&E.
- VI. **Receiver Customer ID:** *Arbitrary Text:* This is the receiving entity's identification reference for the account to which this record applies. Currently, only the first 12 characters of this field will be recognized by PG&E, 13 by SCE.
- VII. **Time Stamp:** *Date/Time ("CCYYMMDDHHMM"):* Date and Time that this record was created.
- VIII. **Record ID:** *Arbitrary Text:* This is an optional field that may be supplied in a request record. The contents of this field will be returned unchanged in the corresponding response record. The length of this text shall not exceed 16 characters.
- IX. **Operation Type:** *Protocol Text:* What kind of operation triggered this record to be transmitted. See "MEPAD01 Operations" below for examples of field use. Defined values are:
  - A. "CUST-REQ" – (Customer to UDC) establish/break direct access with SP.
  - B. "CUST-ACK" – (UDC to Customer) acknowledge success of access request.
  - C. "CUST-NAK" – (UDC to Customer) reject an access request.
  - D. "SP-REQ" – (SP to UDC) establish/break direct access with customer.
  - E. "SP-ACK" – (UDC to Customer) acknowledge success of access request.
  - F. "SP-NAK" – (UDC to SP) reject an access request.
  - G. "ACNT-REQ" – (SP to UDC) request resend of account information.
  - H. "ACNT-RESP" – (UDC to SP) resend account information.
  - I. "MD-REQ" – (ESP or UDC to MA) request resend of metering data.
  - J. "MD-ACK" – (MA to UDC or ESP) acknowledge request for resend metering data.
  - K. "MD-NAK" – (MA to SP) reject a request for resend.
  - L. "BD-REQ" – (SP to UDC or UDC to SP) request resend of billing data.
  - M. "BD-ACK" – (UDC to SP or SP to UDC) acknowledge request for resend billing data.
  - N. "BD-NAK" – (UDC to SP or SP to UDC) reject a request for resend of billing data.
  - O. "SVC" – (UDC to SP) notify of shutoff or turn-on of service.
  - P. "CFG" – (MA to UDC or ESP) notify of metering configuration change.
  - Q. "METER" – (MA to UDC or ESP) notify of meter change out.
  - R. "BILL-ADDR" – (UDC to SP or SP to UDC) notify of billing address change.
  - S. "ACK" – (SP to UDC or UDC to SP) Acknowledge notification.
- X. **Service Relationship Count:** *Numeric Integer:* The number of relationships included in the following "Type of Service Relationship" field.
- XI. **Type of Service Relationship:** *Protocol Text:* The kind of account/entity relationship this record describes. Multiple entries may be supplied. Entries are separated by ASCII space character (20 Hexadecimal). The length of this field shall not exceed 72 characters. Defined values are:
  - A. "MTR-OWN" – Owner of meter.
  - B. "MTR-INST" – Meter installer or maintainer.
  - C. "MTR-RDR" – Meter reader.



- D. **"MTR-AGNT"** – Meter agent for customer.
  - E. **"ELEC-ESP"** – Electric Energy Service Provider for customer
  - F. **"ELEC-SC"** – Electric Scheduling Coordinator for customer.
  - G. **"GAS-ESP"** – Gas Energy Service Provider for customer.
  - H. **"BILLER"** – Customer accounting billing agent.
  - I. **"BILL-CAL"** – Customer's agent for billing calculations.
  - J. **"UDC"** – Customer's Utility Distribution Company.
- XII. **Reason:** *Protocol Text:* Why this transmission is sent. Defined values are:
- A. **"UPDATE"** – Report a change in status.
  - B. **"RESEND"** – Repeat of a previous configuration.
  - C. **"ADJUST"** – An adjustment to a previously sent configuration that may involve billing corrections.
  - D. **"CORRECT"** – A correction to a previously sent configuration that does not involve billing changes.
  - E. **"CONNECT"** – Request direct access.
  - F. **"DISCONNECT"** – Request direct access be discontinued.
  - G. **"NO-READ"** – This is notice that a meter could not be read. The reason the meter could not be read should be placed in the comment field below.
- XIII. **Comment:** *Arbitrary Text:* An optional field used to supply additional information about the indicated operation. This field is typically used in "NAK" transmissions to indicate the reason for rejecting a request. It is also used to indicate the reason a meter could not be read in a "NO-READ" record. The length of this text shall not exceed 64 characters.
- XIV. **UDC ID:** *Arbitrary Text:* Identity of the UDC. It will typically be an abbreviation of the UDC company name. Currently, only the first 16 characters of this field will be recognized by PG&E.
- XV. **UDC Account ID:** *Arbitrary Text:* ESP account information assigned by UDC. This field is supplied to facilitate special contract accounting. Currently, only the first 16 characters of this field will be recognized by PG&E.
- XVI. **Effective Start Date:** *Date/Time ("CCYYMMDDHHMM"):* Communicates requested effective date when used supplied in requests for change in account status. Communicates actual effective date in responses or update notices.
- XVII. **Effective End Date:** *Date/Time ("CCYYMMDDHHMM"):* The date that this "Type of Service Relationship" account was closed.
- XVIII. **Account Status:** *Protocol Text:* A descriptive abbreviation of the status of this account. Defined values are:
- A. **"NEW"** – Defined but not active.
  - B. **"PEND-SP"** – Customer has requested direct access status change. Change is pending, waiting for SP's request.
  - C. **"PEND-CUS"** – SP has requested direct access status change. Change is pending, waiting for Customer's request or contract execution.
  - D. **"PEND-MTR"** – Customer has requested direct access status change. Change is pending; meter changeout required.
  - E. **"PEND"** – Change in direct access status is approved. Waiting for direct access transfer date that will usually be the beginning of the next billing period.
  - F. **"OK"** – Active account.
  - G. **"OFF"** – Shut-off.
  - H. **"INACT"** – Inactive.

- I. **"DEL"** – Deleted.
- J. **"NO-DATA"** – An active account has no metering data available. This indicates that one or more readings have been missed and estimation is not allowed by this account's estimation rules.
- XIX. **Pending Status:** *Protocol Text:* A status as described in the Metering account status" field above that will take effect sometime in the future. This is used by UDC to notify SP that account status will change soon. The effective change time is described in the "Effective start date" or "effective end date" fields above.
- XX. **Pending SP Identifier:** *Arbitrary Text:* This identifies the SP that will "Type of Service Relationship" connection to this customer at the date and time described in "Pending Effective Date." It will typically be an abbreviation of the SP's company name. Currently, only the first 16 characters of this field will be recognized by PG&E.
- XXI. **Reading Estimation Method:** *Protocol Text:* This is a description of the estimation rules applied to estimate values for missing data. Defined values are:
  - A. **"PG&E"** – PG&E's internal estimation method.
  - B. **"MADAWG01"** – Metering and Data Access Working Group method version.
  - C. **"NONE"** – No estimation will be done.
- XXII. **Commodity:** *Protocol Text:* Describes what commodity type this account is for. Defined values are:
  - A. **"E"** – Electricity
  - B. **"G"** – Gas
  - C. **"W"** – Water
  - D. **"S"** – Steam
- XXIII. **Customer Name:** *Arbitrary Text:* This is the customer's complete name. It is used primarily with commercial accounts for company name. Currently, only the first 22 characters of this field will be recognized by PG&E, 8 by SCE.
- XXIV. **Contact Last Name:** *Arbitrary Text:* This is the customer's last name. Currently, only the first 22 characters of this field will be recognized by PG&E.
- XXV. **Contact First Name:** *Arbitrary Text:* This is the customer's first name. Currently, only the first 22 characters of this field will be recognized by PG&E.
- XXVI. **Contact Middle Initial:** *Arbitrary Text:* This is the customer's middle initial. Currently, only 1 character of this field will be recognized by PG&E.
- XXVII. **House/Building Number:** *Arbitrary Text:* This is the part of the street address. Currently, only the first 10 characters of this field will be recognized by PG&E, 6 by SCE.
- XXVIII. **House/Building Fraction Number:** *Arbitrary Text:* This is part of the street address. Currently, only the first 5 characters of this field will be recognized by PG&E, 3 by SCE.
- XXIX. **Street Prefix:** *Arbitrary Text:* This is part of the street address. Currently, only the first 5 characters of this field will be recognized by PG&E, 2 by SCE.
- XXX. **Street Name:** *Arbitrary Text:* This is part of the street address. Currently, only the first 22 characters of this field will be recognized by PG&E, 25 by SCE.
- XXXI. **Street Suffix:** *Arbitrary Text:* This is part of the street address. Currently, only the first 5 characters of this field will be recognized by PG&E, 4 by SCE.
- XXXIII. **Unit Number:** *Arbitrary Text:* This is part of the street address. Currently, only the first 10 characters of this field will be recognized by PG&E, 8 by SCE.
- XXXIV. **City:** *Arbitrary Text:* This is the address city of the meter. Currently, only the first 12 characters of this field will be recognized by PG&E, 25 by SCE.

- XXXIV. **State:** *Arbitrary Text:* This is the address state of the meter. This is a standard abbreviation for the state or province. Currently, only the first 2 characters of this field will be recognized by PG&E, 2 by SCE.
- XXXV. **Country:** *Arbitrary Text:* This is the address country of the meter. Currently, only the first 15 characters of this field will be recognized by PG&E.
- XXXVI. **ZIP:** *Arbitrary Text:* This is the address zip code of the meter. Currently, only the first 5 characters of this field will be recognized by PG&E, 5 by SCE.
- XXXVII. **ZIP Extension4:** *Arbitrary Text:* This is an extension to the address zip code of the meter. Currently, only the first 4 characters of this field will be recognized by PG&E, 4 by SCE.
- XXXVIII. **USPS Carrier Route:** *Arbitrary Text:* This is an extension to the address zip code of the meter. Currently, only the first 2 characters of this field will be recognized by PG&E, 4 by SCE.
- XXXIX. **Standard Time Zone:** *Numeric Integer:* (Generated by MA) Time zone for local time calculations when daylight savings time is NOT in effect. This value is in minutes difference from Universal Coordinated Time (UTC) which, for the purposes of this document, is the same as GMT without daylight savings time applied. Pacific Standard Time has the value -480 (negative four hundred eighty), Eastern Standard Time -300 (negative three hundred).
- XL. **Daylight Time Zone:** *Numeric Integer:* (Generated by MA) Time zone for local time calculations when daylight savings is in effect. If daylight savings time change is not to be used, this field is left empty. Standard algorithms are used to calculate when standard versus daylight savings time is to be applied. This value is in minutes difference from UTC. Pacific Daylight Savings Time has the value -420 (negative four hundred twenty), Eastern Standard Time - 240 (negative two hundred forty).
- XLI. **Service Category:** *Protocol Text:* The category of service. This information is used to calculate distribution loss costs. Defined values are:  
A. **"S"** – Secondary (typically service at less than 2KV).  
B. **"P"** – Primary (typically service at greater than 2KV and less than 60KV).  
C. **"PS"** – Primary Subtransmission.  
D. **"T"** – Transmission (typically service at greater than 60KV).
- XLII. **Meter Congestion Zone:** *Arbitrary Text:* (Generated by UDC) The ISO distribution congestion zone identifier. This may alternatively be used to indicate Load Group, Load Point, Grid Takeout Point, or a combination thereof. Currently, only the first 20 characters of this field will be recognized by PG&E.
- XLIII. **Usage Profile:** *Arbitrary Text:* (Generated by UDC) The description of this accounts usage class. Currently, only the first 12 characters of this field will be recognized by PG&E.
- XLIV. **Billing Option:** *Protocol Text:* This is a description of which entity or entities perform billing for service. Defined values are:  
A. **"DUAL"** – SP bills for service, UDC bills additional fees.  
B. **"UDC"** – UDC bills customer.  
C. **"SP"** – SP bills customer.
- XLV. **UDC Rate Name:** *Arbitrary Text:* (Generated by UDC) UDC rate schedule is commonly used with bill ready accounts. Currently, only the first 12 characters of this field will be recognized by PG&E.
- XLVI. **SP Rate Name:** *Arbitrary Text:* (Generated SP) SP rate schedule required for BA or UDC-Consolidated billing. For bill ready accounts, the text string "BILL-READY" may be used. Currently, only the first 12 characters of this field will be recognized by PG&E.
- XLVII. **Phone International Access:** *Arbitrary Text:* Part of customer phone number. Currently, only the first 3 characters of this field will be recognized by PG&E.

- XLVIII. **Phone Area Code:** *Arbitrary Text:* Part of customer phone number. Currently, only the first 3 characters of this field will be recognized by PG&E.
- XLIX. **Phone Number:** *Arbitrary Text:* Part of customer phone number. Currently, only the first 7 characters of this field will be recognized by PG&E.
- L. **Phone Extension Number:** *Arbitrary Text:* Part of customer phone number. Currently, only the first 6 characters of this field will be recognized by PG&E.
- LI. **FAX Number:** *Arbitrary Text:* Customer's FAX number. Currently, only the first 20 characters of this field will be recognized by PG&E.
- LII. **Renewable Energy Provider:** *Protocol Text:* (Generated by SP) Indicates renewable energy provided for this account. Defined values are:
  - A. (blank) – Renewable energy not provided for this account.
  - B. "N" – Renewable energy not provided for this account.
  - C. "Y" – Renewable energy provided for this account.
- LIII. **Meter Count:** *Numeric Integer:* (Generated by MA) The number of "Meter" fields to follow. A maximum of 12 is allowed.
- LIV. **Meter:** *Arbitrary Text, Time Interval ('MMDDHHMM'), Protocol Text Triplet:* Each data entry is a set of three fields. The number of meter entry sets is described in the "Meter Count" field above. The "Arbitrary Text" entry is the **Meter ID**. This is the placard identifier or faceplate serial number to physically identify a meter. This is usually some arbitrary combination of letters and numbers that make up a meter manufacturer's serial number. It may, however, be some other easily found identifying label on the metering equipment. This field may optionally be used as a channel identifier for situations where the information is useful. Currently, only the first 12 characters of this entry will be recognized by PG&E. The "Time Interval" entry is the **Usage Reading Interval**, the time interval that meter date is supplied. For example, monthly read meters would be encoded as "01000000", weekly as "00070000", hourly as "00000100", and 30 minute as "00000030". Note: "KWHREG", "KVAHREG", "KVARHREG", AND "GASREG" readings are special cases and are always assumed to be available in monthly intervals only for inclusion on printed bills. The "Protocol Text:" contains the **Units parameters**. This is a list of metering units supplied for this account. When multiple data types are available, individual abbreviations are separated by ASCII Space characters (20 Hexadecimal). For example, Meter reading plus kilowatt hours is "KWHREG KWH"; meter reading, kilowatt hours, and kilovar hours is "KWHREG KWH KVARH". A complete list of abbreviations is supplied in the Protocol Text Units listing. A maximum of 8 unit parameter entries per field is allowed. The length of this text shall not exceed 64 characters.

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## "MEPAD02" – Administrative Data Type 2 – Credit Data

The sequence of fields in this record is:

- I. **Record Type:** *Protocol Text:* Always "MEPAD02"
- II. **Record Version:** *Date ('CCYYMMDD'):* Currently "19970819"
- III. **Sender ID:** *Arbitrary Text:* identify of the entity sending this record. It will typically be an abbreviation of the sender's company name. Currently, only the first 16 characters of this field will be recognized by PG&E.

- IV. **Sender Customer ID:** *Arbitrary Text:* This is the senders identification reference for the account to which this record applies. Currently, only the first 12 characters of this field will be recognized by PG&E.
- V. **Receiver ID:** *Arbitrary Text:* Identify of the intended recipient entity of this record. It will typically be an abbreviation of the receiver's company name. Currently, only the first 16 characters of this field will be recognized by PG&E.
- VI. **Receiver Customer ID:** *Arbitrary Text:* This is the receiving entities identification reference for the account to which this record applies. Currently, only the first 12 characters of this field will be recognized by PG&E.
- VII. **Time Stamp:** *Date/Time ("CCYYMMDDHHMM"):* Date and Time that this record was created.
- VIII. **Record ID:** *Arbitrary Text:* This is an optional field that may be supplied in a request record. The length of this text shall not exceed 16 characters.
- IX. **Operation Type:** *Protocol Text:* What kind of operation triggered this record to be transmitted. See "MEPAD01 Operations" below for examples of field use. Defined values are:
  - A. "SP-REQ" – (SP to UDC) Add or delete direct access with customer.
  - B. "SP-ACK" – (UDC to SP) acknowledge success of change request.
  - C. "SP-NAK" – (UDC to SP) reject a change request.
  - D. "ACNT-REQ" – (SP to UDC) request resend of account information.
  - E. "ACNT-RESP" – (UDC to SP) resend account information.
  - F. "CFG" – (MA to UDC or ESP) notify of credit data change.
  - G. "ACK" – (SP to UDC or UDC to SP) acknowledge notification.
- X. **Service Relationship Count:** *Numeric Integer:* The number of relationships included in the following "Type of Service Relationship" field.
- XI. **Type of Service Relationship:** *Protocol Text:* What kind of account/entity relationship this record describes. Multiple entries may be supplied. Entries are separated by ASCII space character (20 Hexadecimal). Defined values are:
  - A. "MTR-OWN" – Owner of meter.
  - B. "MTR-INST" – Meter installer or maintainer.
  - C. "MTR-RDR" – Meter reader.
  - D. "MTR-AGNT" – Meter agent for customer.
  - E. "ELEC-ESP" – Electric Energy Service Provider for customer.
  - F. "ELEC-SC" – Electric Scheduling Coordinator for customer.
  - G. "GAS-ESP" – Gas Energy Service Provider for customer.
  - H. "BILLER" – Customer's agent for billing calculations.
  - I. "BILL-CAL" – Customer's agent for billing calculations.
  - J. "UDC" – Customer's Utility Distribution Company.
- XII. **Reason:** *Protocol Text:* Why this transmission is sent. Defined values are:
  - A. "UPDATE" – report a change in status.
  - B. "RESEND" – repeat of a previous configuration.
  - C. "ADJUST" – an adjustment to a previously sent configuration that may involve billing corrections.
  - D. "CORRECT" – a correction to a previously sent configuration that does not involve billing changes.
  - E. "CONNECT" – request direct access.
  - F. "DISCONNECT" – request direct access be discontinued.

- XIII. **Comment:** *Arbitrary Text:* An optional field used to supply additional information about the indicated operation. This field is typically used in “NAK” transmissions to indicate the reason for rejecting a request. The length of this text shall not exceed 64 characters.
  - XIV. **UDC account ID:** *Arbitrary Text:* ESP account information assigned by UDC. This field is supplied to facilitate special contract accounting. Currently, only the first 16 characters of this field will be recognized by PG&E.
  - XV. **Social security number:** *Arbitrary Text:* Customer’s SSN. Currently, only the first 12 characters of this field will be recognized by PG&E.
  - XVI. **Driver’s license number:** *Arbitrary Text:* Customer’s driver’s license number. Number should be preceded by a two letter prefix for state. Currently, only the first 16 characters of this field will be recognized by PG&E.
  - XVII. **Spouse name:** *Arbitrary Text:* Customer’s spouse’s name. Currently, only the first 22 characters of this field will be recognized by PG&E.
  - XVIII. **Spouse’s social security number:** *Arbitrary Text:* Customer’s spouse’s SSN. Currently, only the first 12 characters of this field will be recognized by PG&E.
  - XIX. **Spouse’s driver’s license number:** *Arbitrary Text:* Customer’s spouse’s driver’s license number. Number should be preceded by a two letter prefix for state. Currently, only the first 16 characters of this field will be recognized by PG&E.
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## Metering Service Data Records

California Metering Exchange Protocol metering communications occur to enable customer energy use and service billing. Most information transmitted in Metering Service Data Records consists of meter reading and energy use data about specific customers.

Metering Service Data Records are typically generated by the MA and supplied to the UDC and ESP. In the case of shut-off or turn-on, the UDC may be responsible for generating appropriate MEPMD01 records with final and initial meter readings. In the case of a changeout, the party changing out the meter may be responsible for providing the final and initial meter readings to the MA.

## Metering Values vs. Date/Time Intervals

The values transmitted in Metering Service Data Records are typically an accumulation of some quantity, such as kilowatt-hours, over an interval of time. Each value has an associated Date/Time field as a time stamp. That time stamp could conceivably identify the beginning or ending time of the interval. Each of these approaches has advantages and disadvantages. **The California Metering Exchange Protocol uses end-of-interval Date/Time time stamps.**

Whether beginning or end of interval time stamps are used, a problem arises that complicates totaling commodity usage on a day by day basis. Either the first or last reading for a day will be listed with the previous or next day’s date. The use of end-of-interval time stamps does not complicate this problem. Totaling algorithms must deal with the fact that the time stamp for the last interval of the day will be for the beginning of the first interval of the next day.

One potential solution to the end-of-interval totaling problem is to simply offset the midnight reading to 23:59. This approach is inadequate simply because billing days often do not begin and end at midnight. Some other time of the day, such as 0700 local time is used. Offsetting all time stamps by one minute might minimize this one minor totaling problem but would introduce a systemic error in data representation. If such measures are desirable, they should be applied to the data after it is transmitted via California Metering Exchange Protocol.

## **Time-Of-Use Metering**

There are two broad categories of metering data intervals employed for different accounts. The first is pure interval values, such as those accounts that are billed on total energy use on an hourly or monthly basis. The second is what is traditionally known as Time-Of-Use where energy use is broken into as many as five or more components. These components are normally labeled “On-Peak”, “Off-Peak”, and so on. (PG&E typically defines three components: “On-Peak”, “Part-Peak”, and “Off-Peak”). Time-Of-Use billing has typically been applied to monthly totals of individual use components but day-by-day billing is possible.

Time-Of-Use totaling is usually complicated by the treating of weekdays, weekends and holidays differently when assigning usage to On-Peak, or other categories. Often, all day Sunday is treated as an Off-Peak period. Time-Of-Use metering totals must therefore be identified by their component names and the overall time interval for which they are accumulated. Time-Of-Use and Interval data formats differ sufficiently to justify supporting them with two separate record types. Interval data is supported by “MEPMD01” – Metering Data Type 1 records and Time-Of-Use with “MEPMD02” – Metering Data Type 2 records.

## **Beginning and End of Month Meter Reads**

Nominally, data transmissions of cumulative meter reads, such as monthly meter reads, should include both beginning of period and end of period date and usage values. This allows receiving entities to verify that no reading overlaps or gaps have occurred.

## **“MEPMD01” – Metering Data Type 1 – Interval Data**

Interval Data is data that represents regular interval accumulation of energy usage information, such as 15-minute, hourly, daily, or monthly accumulation or demand. Most energy metering information may be represented using this record. The exception is traditional Time-Of-Use (TOU) usage accumulation that has complex irregular interval definition. TOU data may be represented using “MEPMD02” record type.

“MEPMD01” represents a format to facilitate the transfer of metering data. It is not intended to define how a utility customer’s energy use is administered or billed. “MEPMD01” supports single meter socket values. Utility customers with more than one meter per account must be explicitly handled. Billing for a single utility customer that involves the aggregation of metering values may be done by some negotiated scheme by the UDC acting as metering agent. It could also be handled by using “MEPMD01” records to transfer metering values separately, as separate metering accounts, to be combined later in that customer’s billing service. Both methods are supportable by “MEPMD01”.

The sequence of fields in this record is:

- I. **Record Type:** *Protocol Text:* Always **"MEPMD01"**
- II. **Record Version:** *Date ("CCYYMMDD"):* Currently **"19970819"**
- III. **Sender ID:** *Arbitrary Text:* Identify of the entity sending this record. It will typically be an abbreviation of the sender's company name. Currently, only the first 16 characters of this field will be recognized by PG&E.
- IV. **Sender Customer ID:** *Arbitrary Text:* This is the senders identification reference for the account to which this record applies. Currently, only the first 12 characters of this field will be recognized by PG&E.
- V. **Receiver ID:** *Arbitrary Text:* Identify of the intended recipient entity of this record. It will typically be an abbreviation of the receiver's company name. Currently, only the first 16 characters of this field will be recognized by PG&E.
- VI. **Receiver Customer ID:** *Arbitrary Text:* This is the receiving entities identification reference for the account to which this record applies. Currently, only the first 12 characters of this field will be recognized by PG&E.
- VII. **Time Stamp:** *Date/Time ("CCYYMMDDHHMM"):* Date and Time that this record was created.
- VIII. **Meter ID:** *Arbitrary Text:* This is the placard identifier or faceplate serial number to physically identify a meter. This is usually some arbitrary combination of letters and numbers that make up a meter manufacturer's serial number. It may, however, be some other easily found identifying label on the metering equipment. This field may optionally be used as a channel identifier for situations where the information is useful. Currently, only the first 12 characters of this entry will be recognized by PG&E.
- IX. **Purpose:** *Protocol Text:* Indicates the reason for this data transmission. Defined values are:
  - A. **"OK"** – Normal transmission
  - B. **"RESEND"** – Retransmission of previously sent data.
  - C. **"SUMMARY"** – Summary of SP totaled data. Summary data usually consists of values calculated from metering data such as monthly totals calculated from 15 minute readings. This data is often supplied on a regular basis (such as for quarterly reports).
  - D. **"HISTORY"** – Archival account data. Archival data is retrieved from long term storage and may be of lesser time resolution than its original collection period. This data is generally supplied once per request for analysis purposes.
  - E. **"PROFILE"** – Account usage profile data.
  - F. **"TEMPLATE"** – Account usage template data.
- X. **Commodity:** *Protocol Text:* Describes what commodity type this account is for. Defined values are:
  - A. **"E"** – Electricity.
  - B. **"G"** – Gas.
  - C. **"W"** – Water.
  - D. **"S"** – Steam.
- XI. **Units:** *Protocol Text:* Describes the units of the data values. Examples of values are "KWHREG", "KWH", and "THERM". A complete list of abbreviations is supplied in the Protocol Text Units listing. Data quality flags are used to indicate the raw, estimated, valid, etc., status of values transmitted.
- XII. **Calculation Constant:** *Numeric Floating-Point:* Defines an optional value that is used as a multiplier to convert data values to engineering units. Typically this parameter is used with "PULSE" data to allow calculation of equivalent "KWH" and "THERM" values.



- XIII. **Interval:** *Time Interval ("MMDDHHMM")*: Describes the time interval between readings. Metering data is transmitted as Date/Time and value pairs. In many cases, however, the time intervals for the data values is so regular that the Date/Time information past the first reading is essentially redundant. This field may be used to minimize this redundancy problem. If a Date/Time field, after the first reading in a line, is empty, it is calculated by adding this interval to the Date/Time of the previous value. This field is ignored if no empty Date/Time fields are encountered in the record. This field is optional if Date/Time fields are supplied for all values.
- XIV. **Count:** *Numeric Integer*: Indicates the number of Date/Time, flag, and value sets to follow. A maximum of 48 sets is allowed per record.
- XV. **Data:** *Date/Time ("CCYYMMDDHHMM"), Protocol Text, and Numeric Floating-Point triplet*: Each data entry is a set of three fields. The number of data entry sets is described in the "Count" field above. When an "Interval" field is supplied, Date/Time fields after the first may be left empty to be calculated when the record is read. An empty Date/Time field is calculated by adding the time interval described in the "Interval" field to the supplied or calculated Date/Time value of the previous entry pair in this record. The Protocol Text field is an optional field used as a data quality flag. Defined values are:
- A. **"(empty)"** – An empty flag field indicates that the value is OK and validated.
  - B. **"E"** – Value is estimated. Estimation method is described in account's "MEPAD01" record.
  - C. **"A"** – Value is an adjustment. Adjustments are made to correct metering inconsistencies or errors.
  - D. **"N"** – Value is empty. No value is being sent for this interval. May be sent as the first entry for a new account.
  - E. **"R"** – Value is raw. No validation has been performed on value.

## "MEPMD02" – Metering Data Type 2 – TOU Data

The sequence of fields in this record is:

- I. **Record Type:** *Protocol Text*: Always **"MEPMD02"**
- II. **Record Version:** *Date ("CCYYMMDD")*: Currently **"19970819"**
- III. **Sender ID:** *Arbitrary Text*: Identity of the entity sending this record. It will typically be an abbreviation of the sender's company name. Currently, only the first 16 characters of this field will be recognized by PG&E.
- IV. **Sender Customer ID:** *Arbitrary Text*: This is the senders identification reference for the account to which this record applies. Currently, only the first 12 characters of this field will be recognized by PG&E.
- V. **Receiver ID:** *Arbitrary Text*: Identity of the intended recipient entity of this record. It will typically be an abbreviation of the receiver's company name. Currently, only the first 16 characters of this field will be recognized by PG&E.
- VI. **Receiver Customer ID:** *Arbitrary Text*: This is the receiving entities identification reference for the account to which this record applies. Currently, only the first 12 characters of this field will be recognized by PG&E.
- VII. **Time Stamp:** *Date/Time ("CCYYMMDDHHMM")*: Date and Time that this record was created.
- VIII. **Meter ID:** *Arbitrary Text*: This is the placard identifier or faceplate serial number to physically identify a meter. This is usually some arbitrary combination of letters and numbers that make up a meter manufacturer's serial number. It may, however, be some other easily found identifying label on the metering equipment. This field may optionally be used as a channel

identifier for situations where the information is useful. Currently, only the first 12 characters of this entry will be recognized by PG&E.

- IX. **Purpose:** *Protocol Text:* Indicates the reason for this data transmission. Defined values are:
- A. **"OK"** – Normal transmission
  - B. **"RESEND"** – Retransmission of previously sent data.
  - C. **"SUMMARY"** – Summary of SP totaled data. Summary data usually consists of values calculated from metering data such as monthly totals calculated from daily readings. This data is often supplied on a regular basis (such as for quarterly reports).
  - D. **"HISTORY"** – Archival account data. Archival data is retrieved from long term storage and may be of lesser time resolution than its original collection period. This data is generally supplied once per request for analysis purposes.
  - E. **"PROFILE"** – Account usage profile data.
  - F. **"TEMPLATE"** – Account usage template data.
- X. **Commodity:** *Protocol Text:* Describes what commodity type this account is for. Defined values are:
- A. **"E"** – Electricity.
  - B. **"G"** – Gas.
  - C. **"W"** – Water.
  - D. **"S"** – Steam.
- XI. **Units:** *Protocol Text:* Describes the units of the data values. Examples of values are "KWHREG", "KWH", and "THERM". A complete list of abbreviations is supplied in the Protocol Text Units listing. Where multiple unit types and seasons are transmitted, separate MEPMD02 records are sent for each. Data quality flags are used to indicate the raw, estimated, valid, etc., status of values transmitted.
- XII. **Season Identifier:** *Protocol Text:* This identifies the season for which the values apply. Defined values are:
- A. **"S"** – Summer.
  - B. **"W"** – Winter.
- This field may be left blank for accounts that do not differentiate between seasons. If this field is blank, it will be interpreted as indicating winter for those accounts that do. A record may contain data for one season only. Data for different seasons must be sent in separate records.
- XIII. **Calculation Constant:** Numeric Floating-Point: Defines an optional value which is used as a multiplier to convert data values to engineering units. Typically this parameter is used with "PULSE" data to allow calculation of equivalent "KWH" and "THERM" values.
- XIV. **Data Start Time:** Date/Time ("CCYYMMDDHHMM"): Describes date and time that the data interval reported in this record began.
- XV. **Data Time stamp:** Date/Time ("CCYYMMDDHHMM"): Describes date and time that ends the interval reported in this record.
- XVI. **Count:** Numeric Integer: Indicates the number of label-flag-value sets to follow. A maximum of 6 sets is allowed per record.
- XVII. **Data:** Protocol Text, Protocol Text, and Numeric Floating-Point triplet: Each data entry is a set of three fields. A maximum of 6 sets is allowed per record. Each set consists of a Protocol Text Time-Of-Use component label field, a Protocol Text data quality flag, and a Numeric Floating-Point-Value. The number of data entry sets is described in the "Count" field above. Defined values for the quality flag field are described in the "MEPMD01" record above. (An empty field indicates that the value is OK.) Defined values for the label field are:
- A. **"ON-PEAK"**

- B. "OFF-PEAK"
  - C. "PART-PEAK"
  - D. "PEAK-2"
  - E. "PEAK-3"
  - F. "PEAK-4"
  - G. "TOTAL"
- 

## Billing Service Data Records

California Metering Exchange Protocol billing communications occur to enable billing information to be transferred between companies. Billing communications usually occurs between the Billing Agent (BA) and other SPs or the UDC. The billing record types are:

1. **"MEPBD01" – Billing Data Type 1 – Customer billing charges and adjustments.** This record contains specific billing component values as would be printed on a customer's bill. This information is sent once per billing period per customer. This category of information is typically sent from the BA to the SP.
2. **"MEPBD02" – Billing Data Type 2 – Interval account pricing plan.** Simple hourly pricing plan information is transmitted using this record type. This category of information is typically send from the SP to the BA for billing by the BA.
3. **"MEPBD03" – Billing data Type 3 – Time-Of-Use account pricing plan.** Simple hourly pricing plan information is normally transmitted using "MEPMD02" – Metering Data Type 2 records. Some accounts, however, use complex energy pricing plans. In fact, some larger accounts will be tailored to their customer's specific business needs to a degree that designing a record to describe their pricing plans is impossible. This record is designed to handle a Time-Of-Use account pricing situation. This category of information is typically sent from the SP to the MA for billing by the MA.

## Pricing and Billing Values vs. Date/Time Intervals

The values transmitted in Metering Service Data Records are typically an accumulation of some quantity, such as kilowatt hours, over an interval of time. Each value has an associated Date/Time field as a time stamp. That time stamp could conceivably identify the beginning or ending time of the interval. Each of these approaches has advantages and disadvantages. **The California Metering Exchange Protocol uses end-of-interval Date/Time time stamps.**

Whether beginning or end of interval time stamps are used, a problem arises that complicates totaling commodity usage on a day by day basis. Either the first or last reading for a day will be listed with the previous or next day's date. The use of end-of-interval time stamps does not complicate this problem. Totaling algorithms must deal with the fact that the time stamp for the last interval of the day will be for the beginning of the first interval of the next day.

One potential solution to the end-of-interval totaling problem is to simply offset the midnight reading to 23:59. This approach is inadequate simply because billing days often do not begin and end at midnight. Some other time of the day, such as 0700 local time is used. Offsetting all time stamps by one minute might minimize this

one minor totaling problem but would introduce a systemic error in data representation. If such measures are desirable, they should be applied to the data after it is transmitted via California Metering Exchange Protocol.

## “MEPBD01” – Billing Data Type 1 – Billed Dollars

The sequence of fields in this record is:

- I. **Record Type:** *Protocol Text:* Always “MEPBD01”
- II. **Record Version:** *Date (“CCYYMMDD”):* Currently “19970819”
- III. **Sender ID:** *Arbitrary Text:* Identify of the entity sending this record. It will typically be an abbreviation of the sender’s company name. Currently, only the first 16 characters of this field will be recognized by PG&E.
- IV. **Sender Customer ID:** *Arbitrary Text:* This is the senders identification reference for the account to which this record applies. Currently, only the first 12 characters of this field will be recognized by PG&E.
- V. **Receiver ID:** *Arbitrary Text:* Identify of the intended recipient entity of this record. It will typically be an abbreviation of the receiver’s company name. Currently, only the first 16 characters of this field will be recognized by PG&E.
- VI. **Receiver Customer ID:** *Arbitrary Text:* This is the receiving entities identification reference for the account to which this record applies. Currently, only the first 12 characters of this field will be recognized by PG&E.
- VII. **Time Stamp:** *Date/Time (“CCYYMMDDHHMM”):* Date and Time that this record was created.
- VIII. **Record ID:** *Arbitrary Text:* This is an optional field that may be supplied in a request record. The contents of this field will be returned unchanged in the corresponding response record. The length of this text shall not exceed 16 characters.
- IX. **Purpose:** *Protocol Text:* Indicates the reason for this data transmission. Defined values are:
  - A. “OK” – Normal transmission
  - B. “RESEND” – Retransmission of previously sent data.
  - C. “CORRECT” – Correction to previously sent data.
  - D. “ADJUST” – Adjustment to previously sent amounts.
  - E. “PAYMENT” – Notice of payment.
  - F. “UNCOLLECT” – Notice of problem with payment.
- X. **Comment:** *Arbitrary Text:* An optional field used to supply additional information about the indicated operation. This field will contain a short, human readable text. It will typically be supplied to indicate the reason for a correction or an adjustment. The length of this field shall not exceed 64 characters.
- XI. **Bill period start date:** *Date/Time (“CCYYMMDDHHMM”):* The first day of this billing period.
- XII. **Bill period close date:** *Date/Time (“CCYYMMDDHHMM”):* The last day of this billing period.
- XIII. **Bill period meter start:** *Numeric Integer:* The beginning of billing period meter reading.
- XIV. **Bill period meter close:** *Numeric Integer:* The end of billing period meter reading.
- XV. **Meter ID:** *Arbitrary Text:* This is the placard identifier or faceplate serial number to physically identify a meter. This is usually some arbitrary combination of letters and numbers that make up a meter manufacturer’s serial number. It may, however, be some other easily found identifying label on the metering equipment. This field may optionally be used as a channel identifier for situations where that information is useful. Currently, only the first 12 characters of this entry will be recognized by PG&E.

- XVI. **Bill Total:** *Numeric Floating-Point:* Total amount billed for this record. This value does not include "Previous Balance".
- XVII. **Previous Balance:** *Numeric Floating-Point:* Any unpaid amount from previous billing period.
- XVIII. **Component Count:** *Numeric Integer:* The number of billing component items to follow. A maximum of 64 is allowed.
- XIX. **Components:** Protocol Text, Arbitrary Text, and Numeric Floating-Point triplet: Each component entry is a set of three fields. The number of component sets is described in the "Component Count" field above. The Protocol Text field of each pair contains an identifier for the kind of component the following optional Arbitrary Text description field and Numeric Floating-Point value represents. Currently, only the first 30 characters of this entry will be recognized by PG&E. Note that a type "OTHER" is supplied to enable transmission of information about otherwise undefined billing items. The Defined Protocol Text values are:
- A. **"Usage"** – An explanatory entry providing commodity usage information for printing on a customer's bill. The Numeric Floating-Point field contains the usage quantity described in the Arbitrary Text field. The Numeric Floating-Point field value is not totaled with other values in this record.
  - B. **"TEXT"** – A text line to be printed on bill. The Numeric Floating-Point field of this triplet is ignored.
  - C. **"ELEC-ENERGY"** – Electric energy part of bill total. There may be multiple "ELEC-ENERGY" entries. The Arbitrary Text field is not optional and must describe this component.
  - D. **"ELEC-TRANS"** – Transmission component of bill total.
  - E. **"ELEC-DIST"** – Distribution component of bill total.
  - F. **"ELEC-PPP"** – Public Purpose Programs component of bill total.
  - G. **"ELEC-CTC"** – Competition Transition Costs (CTC) component of bill total.
  - H. **"ELEC-TOTAL"** – Total electric charges.
  - I. **"GAS-ENERGY"** – Gas energy part of bill total. There may be multiple "GAS-ENERGY" entries. The Arbitrary Text field is not optional and must describe this component.
  - J. **"GAS-TOTAL"** – Gas charges total of bill total.
  - K. **"OTHER"** – Some other kind of billed amount. The Arbitrary Text field is not optional and must describe this component.
  - L. **"DISCOUNT"** – A dollar amount discount applied to above billed amounts. The Arbitrary Text field is not optional and must describe this component.
  - M. **"ADJUST"** – A dollar amount adjustment to be applied to above billed amounts. The Arbitrary Text field is not optional and must describe this component.
  - N. **"CREDIT"** – A dollar amount adjustment to be applied to above billed amounts. The Arbitrary Text field is not optional and must describe this component.
  - O. **"REFUND"** – A dollar amount adjustment to be applied to above billed amounts. The Arbitrary Text field is not optional and must describe this component.

### **"MEPBD02" – Billing Data Type 2 – Interval Pricing Plan**

This record is provided to allow SP or UDC to describe to BA how to bill their customer. It is used to describe hourly or periodic pricing schedules. Various kinds of usage summary and billing information are transmitted using this record type. Price is in US dollars per unit of commodity.

The sequence of fields in this record is:

- I. **Record Type:** *Protocol Text:* Always “MEPBD02”
- II. **Record Version:** *Date (“CCYYMMDD”):* Currently “19970819”
- III. **Sender ID:** *Arbitrary Text:* Identity of the entity sending this record. It will typically be an abbreviation of the sender’s company name. Currently, only the first 16 characters of this field will be recognized by PG&E.
- IV. **Receiver ID:** *Arbitrary Text:* Identify of the intended recipient entity of this record. It will typically be an abbreviation of the receiver’s company name. Currently, only the first 16 characters of this field will be recognized by PG&E.
- V. **Time Stamp:** *Date/Time (“CCYYMMDDHHMM”):* Date and Time that this record was created.
- VI. **Record ID:** *Arbitrary Text:* This is an optional field that may be supplied in a request record. The contents of this field will be returned unchanged in the corresponding response record. The length of this text shall not exceed 16 characters.
- VII. **Operation Type:** *Protocol Text:* What kind of operation triggered this record to be transmitted. Defined values are:
  - A. “UPDATE” – This is notice of a change in plan or creation of a new plan.
  - B. “UPDATE-ACK” – Acknowledge plan change.
  - C. “UPDATE-NAK” – Reject plan change.
  - D. “REMOVE” – This is notice of deletion of a plan entry.
  - E. “REMOVE-ACK” – Acknowledge deletion.
  - F. “REMOVE-NAK” – Reject deletion.
  - G. “CFG-REQ” – (SP to UDC) Request plan records.
  - H. “CFG” – This is current plan, no change has occurred.
  - I. “CFT-NAK” – Reject a plan request.
- VIII. **Purpose:** *Protocol Text:* Indicates the reason for this data transmission. Defined values are:
  - A. “OK” – Normal transmission
  - B. “RESEND” – Retransmission of previously sent data.
  - C. “CORRECT” – Correction to previously sent data.
- IX. **Comment:** *Arbitrary Text:* An optional field used to supply additional information about the indicated operation. This field will contain a short, human readable text. It will typically be supplied to indicate the reason for a correction or an adjustment. The length of this field shall not exceed 64 characters.
- X. **Pricing plan identifier:** *Arbitrary Text:* This identifies this plan which will be referenced in account configuration records. This identifier is generated by the SP. Currently, only the first 12 characters of this field will be recognized by PG&E.
- XI. **Plan start date:** *Date/Time (“CCYYMMDDHHMM”):* The date this pricing plan goes into effect.
- XII. **Plan end date:** *Date/Time (“CCYYMMDDHHMM”):* The date that this pricing plan is no longer in effect.
- XIII. **Commodity:** *Protocol Text:* Describes what quantity this billing is for. Defined values are:
  - A. “E” – Electricity.
  - B. “G” – Gas.
  - C. “W” – Water.
  - D. “S” – Steam.
- XIV. **Commodity Units:** *Protocol Text:* The units that apply to the following usage fields. Allowed values are:
  - A. “THERM” – Gas Therms.

- B. **“KWH”** – Kilowatt hours.
  - C. **“GAL”** – Gallons.
  - D. **“CUFT”** – Cubic Feet.
  - E. **“ACFT”** – Acre-Feet.
  - F. **“LBS”** – Pounds.
- XV. **Limit:** *Numeric Floating-Point*: This optional field describes the **lower limit** of commodity **interval** usage of this plan’s table should be applied. Limit is used with two-tiered or multi-tiered energy pricing. An empty Limit field or a Limit value of zero indicates that this is the base commodity price. When a non-zero price is supplied in this field, the prices in this plan apply when an interval usage total exceeds this value.
- XVI. **Flat Rate price:** *Numeric Floating-Point*: A fixed price amount billed each billing period.
- XVII. **Flat Usage Description:** *Arbitrary Text*: A description of fixed price rules for this account. Currently, only the first 30 characters of this field will be recognized by PG&E.
- XVIII. **Interval:** *Time Interval (“MMDDHHMM”)*: Describes the time interval between readings. Pricing and billing data is transmitted as Date/Time and value pairs. In many cases, however, the time intervals for the data values are so regular that Date/Time information past the first reading is essentially redundant. This field may be used to minimize this redundancy problem. If a Date/Time field, after the first entry in a line, is empty, it is calculated by adding this interval to the Date/Time of the previous value. This field is ignored if no empty Date/Time fields are encountered in the record. This field is optional if Date/Time fields are supplied for all values.
- XIX. **Count:** *Numeric Integer*: Indicates the number of Date/Time and value pairs to follow. A maximum of 48 pairs is allowed per record.
- XX. **Data:** *Date/Time (“CCYYMMDDHHMM”)*: and *Numeric Floating-Point* pair: Each data entry is a pair of fields. The number of data entry pairs is described in the “Count” field above. When an “Interval” field is supplied, Date/Time fields after the first may be left empty to be calculated when the record is read. An empty Date/Time field is calculated by adding the time interval described in the “Interval” field to the supplied or calculated Date/Time value of the previous entry in this record.

### **“MEPBD03” – Billing Data Type 3 – TOU Pricing Plan**

This record is provided to allow SPs to describe to UDCs how to bill their customers. A completely general approach to defining billing algorithms would take on the character of a general purpose programming language. This record does not attempt to achieve that goal. It models a straightforward Off-Peak, On-Peak, etc., two-tiered energy pricing scheme.

Usage Price Limit fields specified below are used with two-tiered or multi-tiered energy pricing. An empty Limit field or a Limit value of zero indicates that this is the base commodity price. When a non-zero price is supplied in this field, the prices in this plan apply when a usage total exceeds this value. A small customer account pricing plan might be \$0.10 KWH for the first 5000 KWH and \$0.05 per KWH after that. In this example, the usage price limit value would be 5000 KWH.

The sequence of fields in this record is:

- I. **Record Type:** *Protocol Text*: Always **“MEPBD03”**
- II. **Record Version:** *Date (“CCYYMMDD”)*: Currently **“19970819”**

- III. **Sender ID:** *Arbitrary Text:* Identity of the entity sending this record. It will typically be an abbreviation of the sender's company name. Currently, only the first 16 characters of this field will be recognized by PG&E.
- IV. **Receiver ID:** *Arbitrary Text:* Identity of the intended recipient entity of this record. It will typically be an abbreviation of the receiver's company name. Currently, only the first 16 characters of this field will be recognized by PG&E.
- V. **Time Stamp:** *Date/Time ("CCYYMMDDHHMM"):* Date and Time that this record was sent.
- VI. **Record ID:** *Arbitrary Text:* This is an optional field that may be supplied in a request record. The contents of this field will be returned unchanged in the corresponding response record. The length of this text shall not exceed 16 characters.
- VII. **Operation Type:** *Protocol Text:* What kind of operation triggered this record to be transmitted. Defined values are:
  - A. **"UPDATE"** – This is notice of a change in plan or creation of a new plan.
  - B. **"UPDATE-ACK"** – Acknowledge plan change.
  - C. **"UPDATE-NAK"** – Reject plan change.
  - D. **"REMOVE"** – This is notice of deletion of a plan entry.
  - E. **"REMOVE-ACK"** – Acknowledge deletion.
  - F. **"REMOVE-NAK"** – Reject deletion.
  - G. **"CFG-REQ"** – (SP to UDC) Request plan records.
  - H. **"CFG"** – This is current plan, no change has occurred.
  - I. **"CFT-NAK"** – Reject a plan request.
- VIII. **Purpose:** *Protocol Text:* Indicates the reason for this data transmission. Defined values are:
  - A. **"OK"** – Normal transmission
  - B. **"RESEND"** – Retransmission of previously sent data.
  - C. **"CORRECT"** – Correction to previously sent data.
- IX. **Comment:** *Arbitrary Text:* An optional field used to supply additional information about the indicated operation. This field will contain a short, human readable text. It will typically be supplied to indicate the reason for a correction or an adjustment. The length of this field shall not exceed 64 characters.
- X. **Pricing plan identifier:** *Arbitrary Text:* This identifies this plan which will be referenced in account configuration records. This identifier is generated by the SP. Currently, only the first 12 characters of this field will be recognized by PG&E.
- XI. **Plan start date:** *Date ("CCYYMMDD"):* The date this pricing plan goes into effect.
- XII. **Plan end date:** *Date ("CCYYMMDD"):* The date that this pricing plan is no longer in effect.
- XIII. **Season Identifier:** *Protocol Text:* This identifies the season for which this plan is to apply. Defined values are:
  - A. **"S"** – Summer.
  - B. **"W"** – Winter.This field may be left blank for accounts that do not differentiate between seasons. If this field is blank, it will be interpreted as indicating winter. If only a summer or a winter version of the plan is found at billing time, the plan will be used for billing regardless of the season. Data for different seasons must be sent in separate records.
- XIV. **Season Begin:** *Date/Time ("CCYYMMDDHHMM"):* Date and time that this billing season begins. This field may be left blank for plans that do not differentiate between seasons.
- XV. **Season End:** *Date/Time ("CCYYMMDDHHMM"):* Date and time that this billing season ends. This field may be left blank for plans that do not differentiate between seasons.
- XVI. **Commodity:** *Protocol Text:* Describes what quantity this billing is for. Defined values are:



- A. **"E"** – Electricity.
  - B. **"G"** – Gas.
  - C. **"W"** – Water.
  - D. **"S"** – Steam.
- XVII. **Commodity Units:** *Protocol Text:* The units that apply to the following usage fields. Allowed values are:
- A. **"THERM"** – Gas Therms.
  - B. **"KWH"** – Kilowatt hours.
  - C. **"GAL"** – Gallons.
  - D. **"CUFT"** – Cubic Feet.
  - E. **"ACFT"** – Acre-Feet.
  - F. **"LBS"** – Pounds.
- XVIII. **Flat Usage price:** *Numeric Floating-Point:* A fixed price amount billed each billing period.
- XIX. **Flat Usage description:** *Arbitrary Text:* A description of fixed price rules for this account. Currently, only the first 30 characters of this field will be recognized by PG&E.
- XX. **Total or On-Peak usage price 1:** *Numeric Floating-Point:* The price of this commodity up to the On-Peak price 1 limit value. Price is in US dollars per unit of commodity.
- XXI. **Total or On-Peak usage price 1 limit:** *Numeric Floating-Point:* This is the On-Peak price 1 limit value.
- XXII. **Total or On-Peak usage price 2:** *Numeric Floating-Point:* The price of this commodity above the On-Peak price 1 limit value. Price is in US dollars per unit of commodity.
- XXIII. **Total or On-Peak demand price:** *Numeric Floating-Point:* The demand charge for this commodity. Price is in US dollars per unit of demand.
- XXIV. **Component Count:** *Numeric Integer:* The number of additional billing component types to follow. A maximum of 5 is allowed.
- XXV. **Components:** Sets of fields that define additional billing components. The number of sets is defined in the "Component Count" field above. Each set consists of the following fields:
- A. **Component Name:** *Protocol Text:* The name of this component. Defined values are:
    - "OFF-PEAK"
    - "PART-PEAK"
    - "PEAK-2"
    - "PEAK-3"
    - "PEAK-4"
  - B. **Price 1:** *Numeric Floating-Point:* The price of this commodity up to the price 1 limit value. Price is in US dollars per unit of commodity.
  - C. **Price 1 limit:** *Numeric Floating-Point:* This is the price 1 limit value.
  - D. **Price 2:** *Numeric Floating-Point:* The price of this commodity above the price 1 limit value. Price is in US dollars per unit of commodity.
  - E. **Demand price:** *Numeric Floating-Point:* The demand charge for this commodity. Price is in US dollars per unit of demand.
  - F. **Weekday Start Time:** *Time ("HHMM"):* The local time-of-day during workdays that this component's time begins.
  - G. **Weekday End Time:** *Time ("HHMM"):* The local time-of-day during workdays that this component's time ends.
  - H. **Saturday Start Time:** *Time ("HHMM"):* The local time-of-day during workdays that this component's time begins. If special Saturday component pricing is not used, this field is left empty – weekday pricing will be applied.

- I. **Saturday End Time:** *Time (“HHMM”)*: The local time-of-day during workdays that this component’s time ends. If special Saturday component pricing is not used, this field is left empty.
- J. **Sunday Start Time:** *Time (“HHMM”)*: The local time-of-day during workdays that this component’s time begins. If special Sunday component pricing is not used, this field is left empty – weekday pricing will be applied.
- K. **Sunday End Time:** *Time (“HHMM”)*: The local time-of-day during workdays that this component’s time ends. If special Sunday component pricing is not used, this field is left empty.
- L. **Holiday Start Time:** *Time (“HHMM”)*: The local time-of-day during holidays that this component’s time begins. If special holiday component pricing is not used, this field is left empty – weekday pricing will be applied.
- M. **Holiday End Time:** *Time (“HHMM”)*: The local time-of-day during holidays that this component’s time ends. If special holiday component pricing is not used, this field is left empty.

## Distribution Loss Factors Data Records

California Metering Exchange Protocol distribution loss factor communications occur to enable accurate account of energy distribution costs. This information is supplied by the UDC.

### “MEPLF01” – Loss Factors Type 1 – Electric

The sequence of fields in this record is:

- I. **Record Type:** *Protocol Text:* Always “MEPLF01”
- II. **Record Version:** *Date (“CCYYMMDD”)*: Currently “19970912”
- III. **Sender ID:** *Arbitrary Text:* Identity of the entity sending this record. It will typically be an abbreviation of the sender’s company name. Currently, only the first 16 characters of this field will be recognized by PG&E.
- IV. **Receiver ID:** *Arbitrary Text:* Identity of the intended recipient entity of this record. It will typically be an abbreviation of the receiver’s company name. Currently, only the first 16 characters of this field will be recognized by PG&E.
- V. **Time Stamp:** *Date/Time (“CCYYMMDDHHMM”)*: Date and Time that this record was created.
- VI. **Record ID:** *Arbitrary Text:* This is an optional field that may be supplied in a request record. The contents of this field will be returned unchanged in the corresponding response record. The length of this text shall not exceed 16 characters.
- VII. **Purpose:** *Protocol Text:* Indicates the reason for this data transmission. Defined values are:
  - A. “OK” – Normal transmission
  - B. “RESEND” – Retransmission of previously sent data.
  - C. “CORRECT” – Correction to previously sent data.
  - D. “ADJUST” – Adjustment to previously sent amounts.
- VIII. **UDC identifier:** *Arbitrary Text:* Identity of the UDC supplying this data. Currently, only the first 16 characters of this field will be recognized by PG&E.
- IX. **Profile date:** *Date/Time (“CCYYMMDDHHMM”)*: The date this data became valid.

- X. **Reference Hour:** *Time (“HHMM”)*: The time for which this loss factor is valid.
  - XI. **DLF type:** *Arbitrary Text*: The type of distribution loss factor. The length of this text shall not exceed 4 characters.
  - XII. **Subtransmission DLF:** *Numeric Floating-Point*: Subtransmission loss factor.
  - XIII. **Primary DLF:** *Numeric Floating-Point*: Primary line loss factor.
  - XIV. **Secondary DLF:** *Numeric Floating-Point*: Secondary line loss factor.
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## Equipment Configuration Records

California Metering Exchange Protocol equipment configuration communications occur to enable metering equipment descriptions to be transferred between companies. MA (meter owners, installers, and maintainers) supplies this information to UDC for disaster recovery purposes. The UDC is typically the first response agency during major service disruptions. Equipment Configuration data is normally stored by UDC for recall by field repair crews to facilitate restoration service to UDC customers.

### “MEPEC01” – Equipment Configuration Data Type 1

The sequence of fields in this record is:

- I. **Record Type:** *Protocol Text*: Always “MEPEC01”
- II. **Record Version:** *Date (“CCYYMMDD”)*: Currently “19970819”
- III. **Sender ID:** *Arbitrary Text*: Identity of the entity sending this record. It will typically be an abbreviation of the sender’s company name. Currently, only the first 16 characters of this field will be recognized by PG&E.
- IV. **Sender Customer ID:** *Arbitrary Text*: This is the senders identification reference for the account to which this record applies. Currently, only the first 12 characters of this field will be recognized by PG&E.
- V. **Receiver ID:** *Arbitrary Text*: Identify of the intended recipient entity of this record. It will typically be an abbreviation of the receiver’s company name. Currently, only the first 16 characters of this field will be recognized by PG&E.
- VI. **Receiver Customer ID:** *Arbitrary Text*: This is the receiving entity’s identification reference for the account to which this record applies. Currently, only the first 12 characters of this field will be recognized by PG&E.
- VII. **Time Stamp:** *Date/Time (“CCYYMMDDHHMM”)*: Date and Time that this record was created.
- VIII. **Record ID:** *Arbitrary Text*: This is an optional field that may be supplied in a request record. The contents of this field will be returned unchanged in the corresponding response record. The length of this text shall not exceed 16 characters.
- IX. **Operation Type:** *Protocol Text*: What kind of operation triggered this record to be transmitted. Defined values are:
  - J. **“UPDATE”** – This is notice of a change in configuration.
  - K. **“UPDATE-ACK”** – Acknowledge configuration change.
  - L. **“UPDATE-NAK”** – Reject configuration change.
  - M. **“REMOVE”** – This is notice of deletion of a configuration entry.
  - N. **“REMOVE-ACK”** – Acknowledge deletion.
  - O. **“REMOVE-NAK”** – Reject deletion.

- P. **"CFG-REQ"** – (SP to UDC) Request configuration records.
- Q. **"CFG"** – This is current configuration, no change has occurred.
- R. **"CFT-NAK"** – Reject a configuration data request.
- X. **Purpose:** *Protocol Text:* Indicates the reason for this data transmission. Defined values are:
  - A. **"OK"** – Normal transmission
  - B. **"RESEND"** – Retransmission of previously sent data.
  - C. **"CORRECT"** – Correction to previously sent data.
- XI. **Comment:** *Arbitrary Text:* An optional field used to supply additional information about the indicated operation. This field is typically used in "NAK" transmissions to indicate the reason for rejecting a request. The length of this field shall not exceed 64 characters.
- XII. **Commodity:** *Protocol Text:* Describes what commodity type this account is for. Defined values are:
  - A. **"E"** – Electricity.
  - B. **"G"** – Gas.
  - C. **"W"** – Water.
  - D. **"S"** – Steam.
- XIII. **Equipment Type:** *Protocol Text:* (Generated by MA) What kind of equipment this record describes. Defined values are:
  - A. **"Meter"** – A meter. When meter and recorder functions are combined in one unit, both "METER" and "RECORDER" equipment type records are supplied for that combined unit.
  - B. **"RECORDER"** – Meter data recorder.
  - C. **"PT"** – A metering potential transformer.
  - D. **"CT"** – A metering current transformer.
- XIV. **Manufacturer:** *Arbitrary Text:* (Generated by MA) Manufacturer's name. Currently, only the first 22 characters of this field will be recognized by PG&E.
- XV. **Model:** *Arbitrary Text:* (Generated by MA) This device's model name or number. Currently, only the first 22 characters of this field will be recognized by PG&E.
- XVI. **Serial Number:** *Arbitrary Text:* (Generated by MA) This device's manufacturer serial number. Currently, only the first 22 characters of this field will be recognized by PG&E.
- XVII. **Identifier:** *Arbitrary Text:* (Generated by MA) An optional identifier to aid visual identification of this device. Currently, only the first 22 characters of this field will be recognized by PG&E.
- XVIII. **Date of purchase:** *Date ("CCYYMMDD"):* (Generated by MA) The date this device was purchased. Month and day values may be estimated.
- XIX. **Date of Installation:** *Date ("CCYYMMDD"):* (Generated by SP) The date this device was installed.
- XX. **Owner:** *Arbitrary Text:* (Generated by SP) Name of entity that owns this device. This field may contain the value "CUSTOMER" to indicate customer ownership else an SP identifier should be used. Currently, only the first 16 characters of this field will be recognized by PG&E.
- XXI. **Parameter Count:** *Numeric Integer:* Indicates the number of Parameter pairs to follow. A maximum of 16 sets is allowed per record.
- XXII. **Parameters:** *Protocol Text and Arbitrary Text pair:* Each parameter entry is a set of two fields. The number of parameter sets is described in the "Parameter Count" field above. The Protocol Text field of each pair contains an identifier for the kind of parameter the following Arbitrary Text describes. The Arbitrary Text field of each pair contains descriptive text. The length of this Arbitrary Text field shall not exceed 30 characters. There are four groups of

parameters, one for Meters, one for Recorders, one for Transformers, and one general purpose group.

1. Defined Protocol Text values for Meters are:
    - **“DEMAND-TYPE”** – What quantity this meter measures. (i.e. KWH, KVARH, CF, etc.) When multiple DEMAND-TYPEs are measured on a single meter, those types are all listed with ASCII space characters (20 Hexadecimal) as separators.
    - **“AMPS”** – Current rating in AMPS.
    - **“VOLTS”** – Voltage rating.
    - **“WIRES”** – The number of wires.
    - **“PHASE”** – Meter Phase.
    - **“KH”** – Meter Kh constant.
    - **“KE”** – Meter Ke constant.
  2. Defined Protocol Text values for Recorders are:
    - **“COMM-TYPE”** – What kind of communications path is used. Examples are “Dial-up”, “Internet”, and “ATT-PCS”.
    - **“PROTOCOL”** – What communications protocol is used. Examples are “MFGR” (manufacturers proprietary protocol), “TCP/IP”, and “C12.XX”.
    - **“FORMAT”** – Data format if different or at higher level than communications protocol.
    - **“ADDRESS”** – Communications network address or dial-up circuit number.
  3. Defined Protocol Text values for Transformers are:
    - **“RATIO”** – Transformer ratio. Expressed as ratio to one.
    - **“PRIMARY”** – Primary Rating in volts or amps.
    - **“INSULATION”** – Insulation voltage class.
    - **“LOCATION”** – Location code for this device. This will typically be “INDOORS” or “OUTDOORS”.
    - **“HI-LO”** – High side, Low side designator. Example values are “HIGH” and “LOW”.
    - **“SINGLE-DUAL”** – Single or Dual configuration designator. Example values are “SINGLE” and “DUAL”.
  4. General Use Protocol Text values are:
    - **“OTHER”** – Other unspecified equipment parameter.
    - **“NOTE”** – General text note.
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## Change History

Version 0.11 – April 24, 1997: First version released for review.

Version 0.12 – June 23, 1997:

- Dave Harrison – PG&E. Changed fields in metering data records, MEPMD01 and MEPMD02, that refer to “ESP” to “SP” (Service Provider) since data may be sent to entities other than Electric Service Providers.
- Mark Budka – SCE, Jim Price – CPUC ORA: Added item 3 in “Specific Business Objectives” above to indicate that California MEP is a transitional piece of electric industry restructuring.
- Jim Price – CPUC ORA: Added paragraph in Metering Service Data Records section describing that monthly readings should be transmitted with both beginning and end of month information.

- Mark Budka – SCE: Added “NO-READ” option to “Reason” field of MEPAD01 to accommodate missed meter read notification. Reason for no read is filled into comment field.
- Mark Budka – SCE: Added comment that a channel number may be used in “Meter ID” field of MEPAD01.
- Nancy Colon – PG&E: Added text in “SP identifier” (was “ESP identifier”) field to indicate that standardized company identifiers will be used when they become available.
- Nancy Colon – PG&E: Added “METER-REQUIRED” status to “Metering Account Status” field in MEPAD01.
- Dave Harrison – PG&E: Added “Type of Service Relationship” field to MEPAD01 to accommodate service Unbundling beyond electric ESP.

Version 0.14 – July 2, 1997:

- Dave Harrison – PG&E: Added MEPAD01 “Type of Service Relationship” protocol text values METER-OWNER, METER-INSTALLER, and METER-READER to subdivide meter agent functions.
- Dave Harrison – PG&E: Renamed MEPAD01 “Metering account status” protocol text values CUST-READY to SP-PENDING and SP-READY to CUST-PENDING to clarify usage.
- Dave Harrison – PG&E: Added MEPAD01 “Billing Option” field to allow specification of billing responsibility.

Version 0.15 – July 17, 1997:

- Dave Presson – PG&E: Added limit to floating-point value range to clarify field interpretation in COBOL based systems. Numeric range to allow describing number in +/-9999999999.99999 format internally.
- Dave Harrison – PG&E: Added description field to MEPBD01 “Component” entries to generalize use of entries. Added “RECURRING” and “ONE-TIME” entry types to cover unanticipated billing items.
- Gary Wescom (author) – PG&E: Added record time stamp to MEPMD01 and MEPMD02 records. This corrects an oversight.
- Nancy Colon – PG&E: Renamed MEPAD01 fields “Metering account start date” to “Metering account effective date” and “Metering account close date” to “Metering account end date”. This was necessary to better match terminology used in state documents.
- Dave Harrison – PG&E: Added MEPAD01 field “Distribution loss indicator”. This field allows UDC to describe distribution distance and or loss factors for distance based billing algorithms.
- Nancy Colon – PG&E: Changed MEPMD01 data quality flag meanings. The “V” for “Validated” category was removed and the description for a blank quality flag entry was changed to say value is “OK” and validated.
- Dave Harrison – PG&E: Increased size of “SP identifier” fields in all records to support California SP identifier scheme.
- Kris Hardie – PG&E: Removed “C” (Corrected) quality flag from MEPMD01 and MDPMD02 “Data” field quality flags. The difference between “A” (Adjusted) and “C” (Corrected) was too vague.
- Kris Hardie – PG&E: Changed label of MEPMD01 and MEPMD02 “Unit of measure” field to simply “Units”. The former is used in other industry documents to mean something somewhat different than what is intended here.

- Susan Sponsel – PG&E: Added new record type MEPEC01, “Equipment Configuration Type 1”. This record is provided to allow meter owners, installers, and maintainers to communicate field hardware configuration to UDCs for emergency repair and disaster recovery use.
- Susan Sponsel – PG&E: Added “Record ID” fields to MEPAD01, MEPBD01, MEPBD02, MEPBD03, and MEPEC01 records. This field allows pairing response records with previously sent request messages.
- Shelly Aires – PG&E: Changed unit abbreviations in “Protocol Text” section. Changed units for situations where customer is generating power from “R...” to “G...”. It appears that some departments in PG&E use RKVA to mean KVAR. RKVA appears to have been a common abbreviation in the past and its incidental use here might cause confusion.
- Shelly Aires – PG&E: Modified MEPMD02 and MEPBD03 TOU records. Improved season designation in both records. Added demand category to pricing plan. Added “TOTAL” category to metering data component list.
- Gary Wescom (author) – PG&E: Added “ACK” operation type to MEPAD01 for protocol completeness.

#### Version 0.16 – July 31, 1997:

- Roger Treinen – PG&E: Changed the name of this protocol from “PG&E Metering Exchange Protocol” to “California Metering Exchange Protocol”. While PG&E performed most of the initial work on this protocol, it now reflects combined efforts of many separate companies. The new name is more correct.
- Kimberly Hollenbeck – PG&E: Removed MEPAD01 field “Template ID” and replaced it with “Usage Profile” and “SP Rate Name” fields. “Template ID” is no longer considered important. The new fields were identified as necessary in paper walk through of inter-company transactions.
- Dave Harrison – PG&E: Added “MD-REQ”, “MD-ACK”, “BD-REQ”, and “BD-ACK” operation type to MEPAD01 for automating requests from SP for UDC to resend metering and billing data.
- Rowena Hale – PG&E: Added several MEPBD01 standard “Components” types.
- Rowena Hale – PG&E: Added “Plan start date” and “Plan end date” to MEPBD02 and MEPBD03 records.

#### Version 0.17 – August 1, 1997:

- No changes: Document distributed without this change history.

#### Version 0.18 – August 11, 1997:

- Kathy Smith – ABB: Updated document to reflect that Metering Agent and Billing Agent activities may now reside outside UDC. References to Metering Agent (MA) and Billing Agent (BA) added.
- Kathy Smith – ABB: Removed “REGISTER” unit type and added specific “KVAHREGISTER”, “KVARHREGISTER”, and “GASREGISTER” units. The ambiguous “REGISTER” entry was proving to be confusing to people.
- Dave Presson – PG&E: Noted that customer usage profiles and billing templates were not specifically mentioned. Added “PROFILE” and “TEMPLATE” values to MEPMD01 “Purpose” field to indicate transmission of this kind of data.
- Dave Presson – PG&E: Generalized MEPBD01 billing component fields by removing specific usage class line types. Replaced these with simple “ELEC-ENERGY” and “GAS-ENERGY” entries and specifying that the Arbitrary Text Field describe the component as printed on bill.

- Dave Presson – PG&E: Removed “Type” field from MEPBD02 record. “Template” and “BILL” usage is no longer applicable.
- Dave Presson – PG&E: Removed “Season identifier”, “Season Begin”, and “Season End” fields from MEPBD02. These fields were redundant to newer “Plan Start Date” and “Plan End Date” fields.
- Dave Presson – PG&E: Changed billing price references from US Cents to US Dollars for consistency between prices and billed amounts.
- Dave Presson – PG&E: Defined Protocol Text fields as having a maximum length of 12 characters, not counting the delimiting comma. Setting a length limit was done to simplify Protocol Text table lookups for protocol conversion activities.
- Dave Presson – PG&E: Shortened some protocol text entries to meet 12 character size limit. Most notable is the shortening of “REGISTER” to “REG” in units abbreviations.
- Kimberly Hollenbeck – PG&E: Added “Flat Rate price” field to MEPBD02 and MEPBD03 records.
- SCE: Replaced “Unique Metering Account Identifier”, “SP Identifier”, and “SP Customer Identifier” with “Sender ID”, “Sender customer ID”, “Receiver ID”, and “Receiver customer ID” in all record types. The original version was UDC centric. This newer approach generalizes the messaging.

#### UDC/ESP Workshop – August 13, 1997:

- MEPAD01: Changed order of fields for clarity.
- MEPAD01: Changed “Type of Service Relationship” field from single to multi-entry. ESPs did not want to have to send separate DASRs for service type for an account.
- MEPAD01: (SCE) Added “UDC account ID” field to facilitate special contract accounting.
- MEPAD01: (SCE, GMER, SDG&E) Added customer name fields.
- MEPAD01: (SCE) Split address information into separate components.
- MEPAD01: (SCE) Split rate name into UDC rate name and SP rate name.
- MEPAD01: (SCE, GMER, SDG&E) Added customer phone and FAX fields.
- MEPAD01: (SCE, SDG&E) Added “Renewable Energy” field.
- MEPAD01: Changed Meter ID and configuration fields to allow up to 12 meters to be defined.
- MEPAD02: (SCE) Added new “MEPAD02”, credit data type record.
- MEPMD01: (PG&E) Added “Meter ID” field.
- MEPMD02: (PG&E) Added “Meter ID” field.
- MEPBD01: (SDG&E) Added “Meter ID” field.
- MEPBD01: Added “Payment” and “Uncollectable” to “Purpose” field.
- MEPBD01: (PG&E) Split usage units and value fields into electric and gas units and value fields.
- MEPBD02: (PG&E) Deleted “Season ID”, “Season Begin”, “Season End”, and “Day” fields. These fields were unnecessary for interval pricing.
- MEPLF01: (SCE) Added new “MEPLD01”, electric distribution loss factors record.

#### Version 1.00 – August 19, 1997: FIRST RELEASE

- Changed all “Record Versions” from “19970401” to “19970819”.

#### Version 1.01 – August 22, 1997:

- Tom Brecken – NCPA: Added “ELEC-SCE” for electric scheduling coordinators to MEPAD01 “Type of service relationship” field.



- Ruth Jenkins – PG&E: Corrected difference in spelling in “Type of service relationship” field between MEPAD01 and MEPAD02.

Version 1.10 – September 18, 1997:

- Roger Treinen – PG&E: Replaced “Distribution Loss Designator” field with “DLF type” field in to MEPLF01. This was done to match DLF working group submittal to CPUC.
- Roger Treinen – PG&E: Removed “Distribution loss designator” field from MEPAD01. This field was no longer needed.
- Roger Treinin – PG&E: Changed the length of the “Meter Congestion Zone” field in MEPAD01 from 4 to 20 characters to accommodate complex encoding of distribution information.
- Roger Treinin – PG&E: Added new “Service Category” field to MEPAD01. This was done to allow description of service feed voltage.
- Roger Treinin – PG&E: Added new “UDC ID” field to MEPAD01. This field was necessary to match accounts with UDC specific loss factions.
- Tom Brake – PG&E: Clarified handling of leading and trailing blank characters in fields. Changed “Specific Protocol Features” to indicate that leading and trailing blanks will be ignored unless the field is enclosed in quotes. The handling of white space is ambiguous without this note.
- Ruth Jenkins – PG&E: Changed “SP-PEND”, “CUST-PEND”, and “MTR-REQ” account status values to “PEND-ST”, “PEND-CUS”, and “PEND-MTR” to simplify mainframe programming.
- Stephanie Liecht – PG&E: Deleted “MEPAD01 – Example Operations” section. This section was superseded by other documents.
- Changed MEPAD01 “Record Version” to “19970912”.
- Changed MEPLF01 “Record Version” to “19970912”.