Metering Service Data Records
(From PGE Web Site - **SDGE CHANGES IN BOLD**)

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 **or MEPMD02** 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 **respective MD**MA. **SDG&E has added a code at the end of the
MEPMD02 records that will be available to flag a read as an opening or closing
read. As it is at the end of the record, it should not interfere with any party that
doesn't choose to look for it.**

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. **SDG&E will provide interval time stamps
using the midnight time of 24:00, but we will accept midnight times of 00:00 or**

24:00. MDMA's should be cautioned that they include the 00:00 interval with the prior day even though most database systems would assign the following day's date to that time.

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. (SDG&E typically defines three components: "On-Peak", "Semi-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, Off-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 monthly 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~~. **SDG&E will only be providing end of the month meter reads**

"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, **or** 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. **Monthly** or 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 a 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:

1. Record Type: Protocol Text: Always "MEPMD01"
2. Record Version: Date ("CCYYMMDD"): Currently "19970819"
3. 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.
4. 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.
5. 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.
6. 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.
7. Time stamp: Date/Time ("CCYYMMDDHHMM"): Date and Time that this record
   was created.
8. Meter ID: Arbitrary Text: This is the placard identifier or faceplate
   serial number to physically identify a meter. **For SDG&E, this is the number
assigned to the meter by the MDMA and reported to the Utility.** 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~~ **11** characters of this entry will be recognized by ~~PG&E~~ **SDG&E**.

> **format 99999999CHN where CH is a literal and N represents the channnel number for the meter and both are optional unless a channel scheme is required for metering.**

9. Purpose: Protocol Text: Indicates the reason for this data transmission. Defined values are:
   - o "OK" - Normal transmission.
   - o "RESEND" - Retransmission of previously sent data.
   - o "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).
   - o "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 of generally supplied once per request for analysis purposes.
   - o "PROFILE" - Account usage profile data. **N/A**
   - o "TEMPLATE" - Account usage template data.
   - o "ADJUSTMENT" - Data is an adjustment for meter data previously sent.

10. Commodity: Protocol Text: Describes what commodity type this account is for. Defined values are:
    - o "E" - Electricity.
    - o "G" - Gas.
    - o "W" - Water.
    - o "S" - Steam.

11. 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.

12. 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. = **1.0**

13. 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 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. **= 00000015**
14. Count: Numeric Integer: Indicates the number of Date/Time, flag, and
value sets to follow. A maximum of 48 sets is allowed per record.
SDG&E will post data where < or =32 (or 8 hours per record)
15. 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.
    format = 9.3
    time is expressed in GMT
When an "Interval" field is supplied, Date/Time fields after the first
may 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:
  o (empty) - An empty flag field indicates that the value is OK and
    validated.
  o "E" - Value is estimated. Estimation method is described in
    account's "MEPAD01" record.
  o "A" - Value is an adjustment. Adjustments are made to correct
    metering inconsistencies or errors.
  o "N" - Value is empty. No value is being sent for this interval.
    May be sent as the first entry for a new account.
  o "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:

1. Record Type: Protocol Text: Always "MEPMD02"
2. Record Version: Date ("CCYYMMDD"): Currently "19970819"
3. 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.
4. 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.

5. 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.

6. 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.

7. Time stamp: Date/Time ("CCYYMMDDHHMM"): Date and Time that this record was created.

8. 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~~ **8** characters of this entry will be recognized by ~~PG&E~~ **SDG&E**.

9. Purpose: Protocol Text: Indicates the reason for this data transmission. Defined values are:
    o "OK" - Normal transmission.
    o "RESEND" - Retransmission of previously sent data.
    o "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).
    o "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 of generally supplied once per request for analysis purposes.
    o "PROFILE" - Account usage profile data. **N/A**
    o "TEMPLATE" - Account usage template data.
    o "ADJUSTMENT" - Data is an adjustment for meter data previously sent.

10. Commodity: Protocol Text: Describes what commodity type this account is for. Defined values are:
    o "E" - Electricity.
    o "G" - Gas.
    o "W" - Water.
    o "S" - Steam.

11. 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.

12. Season identifier: Protocol Text: This identifies the season for which the values apply. Defined values are: "S" - Summer. "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.
13. 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.
14. Data Start Time: Date/Time ("CCYYMMDDHHMM"): Describes date and time that the data interval reported in this record began.
15. Data Time stamp: Date/Time ("CCYYMMDDHHMM"): Describes date and time that ends the interval reported in this record.
16. Count: Numeric Integer: Indicates the number of label-flag-value sets to follow. A maximum of 6 sets is allowed per record.
17. 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 indicates that the value is OK.) Defined values for the label field are:
    o "ON-PEAK"
    o "OFF-PEAK"
    o "~~PART-PEAK~~"
    o "~~PEAK-2~~"
    o "~~PEAK-3~~"
    o "~~PEAK-4~~"
    o "TOTAL"
    o "**SEMI-PEAK**"
    o "**SUP-OFF-PEAK**"
    o **"ON-PEAK-2"**
    o **" SEMI-PEAK-2"**

18. Open/Closing Flag: Protocol Text: Flags record as being for opening or closing meter reads. Current defined values are:

CODE   EVENT

o   **(empty) - An empty flag field indicates that the value is not an opening or closing read.**

o   **"C"-   Change meter, remove read**

- o **"P"-** **Change meter, set read**

- o **"E"-** **New service, set read (new service point)**
- o **"X"-** **Remove meter (not replacing at this same time)**

- o **"F"-** **Final read (normal close of an account)**
- o **"S"-** **Credit turn off read**
- o **"T"-** **Turn on (initial read for opening an account)**
- o **"Z"-** **Reset read (where read in system is manually set to a value)**