Retail Manual

Retail Manual on Metering Standards and Procedures 1.0

Abstract

This manual presents the metering procedures and standards for the Retail Market.

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## Retail Metering Standards and Procedures

### Draft 1.0

### Public

### Document Approval

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<th>Author:</th>
<th>PEMC</th>
<th>Date:</th>
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### Related Document

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<td>Rules for the Integration of Retail Competition in the Wholesale Electricity Spot Market (Retail Rules)</td>
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<td>WESM-MSDM-MM-07</td>
<td>WESM Manual: Metering Standards and Procedures (Issue 7.0)</td>
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<td>Retail Manual: Registration Criteria and Procedures</td>
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### Distribution List

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SECTION 1 INTRODUCTION

1.1 PURPOSE

Pursuant to Clause 4.9 of the Retail Rules, the Central Registration Body shall formulate and publish a market manual that:

a) Describes the class and accuracy requirements of meters;

b) Defines the procedures that Retail Metering Services Providers must undertake to validate, estimate, correct or substitute erroneous meter data;

c) Defines the information that must be contained in the installation database of a Retail Metering Services Provider, and

d) Other relevant procedures to implement the metering provisions of the Retail Rules

As complied, this Manual consolidates the pertinent metering procedures and standards applicable for Contestable Customers and for the reference of Distribution Utilities, Suppliers, Retail Metering Services Providers, other WESM Members and the public. More specifically, this Manual, in compliance to Clause 4.9 of the Retail Rules, will:

a) Define the metering installation standards that a Contestable Customer meter installation must comply with to be eligible for registration in accordance with Retail Rules Clause 4.3.2;

b) Describe the standard numbering system that Retail Metering Services Providers must follow when numbering and identifying their metering installations;

c) Describe the procedures the Central Registration Body, Contestable Customers, and Suppliers must follow when registering Contestable Customer metering installations in the WESM in accordance with Retail Rules Clause 4.3.2.1;

d) Describe the procedures that the Central Registration Body and the Retail Metering Services Providers must follow to ensure Contestable Customer metering data is collected in a timely and efficient manner;

1 As the default Retail Metering Services Provider
e) Describe the procedures of the *Central Registration Body* for the validation, estimation, and revision of *metering data* to make it settlement ready;

f) Describe the reporting procedures in cases where there are errors associated with *metering data* or meter trouble; and

g) Describe the procedures of the *Central Registration Body* for the measurement and monitoring of the annual performance of *Retail Metering Services Providers*.

### 1.2 SCOPE OF APPLICATION

This Manual covers the metering procedures and standards for *meters* of *Contestable Customers* only.

This Manual does not cover the procedure for the registration of *Retail Metering Services Providers*, which is covered by the Retail Manual on Registration Criteria and Procedures.[2]

### 1.3 CONVENTIONS and DEFINITIONS

#### 1.3.1 Conventions

The standard conventions to be followed in this Manual are as follows:

a) The word ‘shall’ denotes a mandatory requirement;

b) Unless otherwise defined or the context implies otherwise, the italicized terms used in this Manual which are defined in the *WESM Rules*, *Retail Rules*, WESM Manual on Metering Standards and Procedures[3], *Grid Code* or *Distribution Code* will bear the same meaning as defined in the *WESM Rules*, *Retail Rules*, WESM Manual on Metering Standards and Procedures Issue, *Grid Code* or *Distribution Code*. Italicized terms that are used in this Manual but are not defined in the *WESM Rules*, *Retail Rules*, WESM Manual on Metering Standards and Procedures Issue, *Grid Code* or *Distribution Code* are defined in Section 1.3.2 of this Manual.

c) Double quotation marks are used to indicate titles of publications, legislation, forms, and other documents; and

d) Any procedure-specific convention(s) shall be identified within the specific document itself.

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[2] DOCUMENT ID
[3] Issue 7.0 WESM-MSDM-MM-07
1.3.2 Definition of Terms

American National Standards Institute (ANSI). A private non-profit organization that oversees the development of voluntary consensus standards for products, services, processes, systems, and personnel in the United States.

End-to-End Test. A continuity test of data transfer from the meter to the Meter Data Retrieval System of the Retail Metering Services Provider and then to the Meter Data Collection System of the Central Registration Body.

International Electrotechnical Commission (IEC). A non-profit, non-governmental international standards organization that prepares and publishes International Standards for all electrical, electronic and related technologies – collectively known as "electrotechnology".

Institute of Electrical and Electronics Engineers (IEEE). A professional association that is dedicated to advancing technological innovation and excellence.

Instrument Transformers. A general term for current transformers and voltage transformers.

Meter Trouble. Any error associated with metering data.

Meter Trouble Report. A report issued by the Central Registration Body to a Retail Metering Services Provider for the correction of detected metering data errors.

1.4 RESPONSIBILITIES

1.4.1 Compliance and Implementation

a) The Central Registration Body shall be responsible for the development, validation, maintenance, publication, and revision of this document in coordination with WESM Members;

b) The Retail Metering Services Provider shall provide the necessary information and references for subsequent revisions and validation of this document;

c) The Rules Change Committee shall be responsible for the initial approval of the subsequent revisions and issuances of this Manual;

d) The PEM Board shall be responsible for the final approval of the subsequent revisions and issuances of this Manual;

e) The Dispute Resolution Administrator shall be responsible for the investigation of any infraction by a Retail Metering Services Provider of
a Contestable Customer, cases where disputes involved metering data, and tampering of any metering installation that is detrimental to the integrity of the metering data; and

f) Any other responsibilities of technical or legal committees or groups as stated in the WESM Rules and Retail Rules, the Grid Code or the Distribution Code which may affect the relevant provision of this Manual.

1.4.2 Amendments

Amendments to this Manual shall be submitted to the WESM Rules Change Committee and shall be acted upon pursuant to Chapter 8 of the WESM Rules and relevant market manuals.

1.5 EFFECTIVITY AND PUBLICATION

This Manual shall take effect upon approval by the Department of Energy. Thereafter, it shall be published in the market information web site.

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4www.wesm.ph
SECTION 2 METERING INSTALLATION STANDARDS

2.1 COVERAGE

This section defines the metering installation standards that a Contestable Customer meter installation must comply with to be eligible for registration in the Wholesale Electricity Spot Market.

The section also covers certain electrical, dimensional, and mechanical characteristics and designs, and takes into consideration certain safety features of current and inductively-coupled voltage transformers of types generally used in the measurement of electricity associated with revenue metering.

2.2 OVERVIEW

a) A metering installation shall be accurate in accordance with the Retail Rules, the Grid Code, the Distribution Code, the WESM Rules and this Manual.

b) A metering installation shall be secure.

c) A metering installation shall have facilities to enable metering data to be transmitted from the metering installation to the Retail Metering Services Provider metering database, and be capable of communicating with the Retail Metering Services Provider metering database.

d) A metering installation shall contain a device which has a visible or an equivalently accessible display of metering data or which allows the metering data to be accessed and read at the same time by portable computer or other equipment of a type or specification reasonably acceptable to all entities who are entitled to have access to that metering data.

e) A metering installation shall have electronic data recording facilities such that all metering data can be measured and recorded in trading intervals.

f) A metering installation shall, where bi-directional active energy flows occur, be capable of separately registering and recording flows in each direction.

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5 Retail Rules Clause 4.3.2.2
6 Retail Rules Clause 4.3.2.3
7 Retail Rules Clause 4.3.2.4
8 Retail Rules Clause 4.3.2.5
9 Retail Rules Clause 4.3.2.6
10 Retail Rules Clause 4.3.2.7
g) A metering installation shall have a meter having an internal data logger capable of storing the metering data for at least sixty days and have a back-up storage facility enabling metering data to be stored for forty-eight hours in the event of external power failure.

h) A metering installation shall have an active energy meter, and, if required in accordance with the Grid Code or Distribution Code, a reactive energy meter having an internal data logger.

2.3 GENERAL COMPLIANCE

This Manual supplements the minimum requirements in the Distribution Code for metering installations of Contestable Costumers. Any metering installation of a higher level of accuracy or functionality than the standards in the Distribution Code and this standard may also be installed.

2.4 METERS

This section provides the standards for meters located within the metering installation. With adherence to these standards, a metering installation shall be able to fully or partially comply with the following clauses of the Retail Rules:

a) Clause 4.3.2.2
b) Clause 4.3.2.3
c) Clause 4.3.2.4
d) Clause 4.3.2.5
e) Clause 4.3.2.6
f) Clause 4.3.2.7
g) Clause 4.3.2.8
h) Clause 4.3.2.9
i) Clause 4.3.3

2.4.1 Redundancy Requirement

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11 Retail Rules Clause 4.3.2.8
12 Retail Rules Clause 4.3.2.9
A metering installation shall have a main and a backup revenue meter of different brands (i.e., different make and model).

2.4.2 Technical Requirements

Meters, both installed as the main revenue meter and backup revenue meter, shall meet the minimum requirements listed in Table 1.

Table 1. Minimum Technical Requirements for Main and Backup Revenue Meters.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>SPECIFICATIONS</th>
<th>REFERENCE DOCUMENTS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy Class</td>
<td>IEC 687 Class 0.2 / ANSI 12.20 Class 0.3 or better</td>
<td>Same as the main meter</td>
<td>ANSI or IEC</td>
</tr>
<tr>
<td>No. of Stator</td>
<td>Corresponds to the service type and complying with Blondel's Theorem</td>
<td>Same as the main meter</td>
<td>Distribution Code ANSI</td>
</tr>
<tr>
<td>Voltage Rating</td>
<td>Corresponds to the secondary voltage rating of voltage transformers used</td>
<td>Same as the main meter</td>
<td>Distribution Code</td>
</tr>
<tr>
<td>Current Rating</td>
<td>Corresponds to the secondary current rating of current transformers used (typically 1A or 5A)</td>
<td>Same as the main meter</td>
<td>ANSI or IEC</td>
</tr>
<tr>
<td>Frequency</td>
<td>60 Hz</td>
<td>Same as the main meter</td>
<td>Distribution Code</td>
</tr>
<tr>
<td>Measurement</td>
<td>Unidirectional active metering (delivered and 2-quadrant reactive metering) or, where bi-directional energy flows, bi-directional active metering</td>
<td>Same as the main meter</td>
<td>Distribution Code Retail Rules</td>
</tr>
<tr>
<td>Interval Data</td>
<td>Programmable to 5, 15, 30 minute interval</td>
<td>Same as the main meter</td>
<td>Distribution Code</td>
</tr>
<tr>
<td>No. of Channels</td>
<td>At least four (4) channels:</td>
<td>Same as the main meter</td>
<td>Distribution Code</td>
</tr>
<tr>
<td></td>
<td>a. kWh (Delivered)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. kVARh (Delivered)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. kWh (Received)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>d. kVARh (Received)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mass Memory</td>
<td>Minimum of 60 day recording of a 15-minute time-stamped demand interval for 4 recording channels</td>
<td>Same as the main meter</td>
<td>Distribution Code</td>
</tr>
<tr>
<td>Recording Billing Quantities</td>
<td>Display and record TOU energy and power parameters (kWh, kVARh)</td>
<td>Same as the main meter</td>
<td>Distribution Code</td>
</tr>
<tr>
<td>ITEM</td>
<td>SPECIFICATIONS</td>
<td>REFERENCE DOCUMENTS</td>
<td></td>
</tr>
<tr>
<td>-----------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------------------</td>
<td></td>
</tr>
<tr>
<td><strong>Security</strong></td>
<td>The meter shall have provisions for securing the meter data, meter configurations and programs by electronic means and/or passwords. It shall also be secured physically by way of security seals.</td>
<td>Same as the main meter</td>
<td>Retail Rules</td>
</tr>
<tr>
<td><strong>Communication Capability</strong></td>
<td>The meter shall have one (1) independent communication ports in addition to the optical port.</td>
<td>Same as the main meter</td>
<td>Retail Rules</td>
</tr>
<tr>
<td><strong>Internal Clock/Battery</strong></td>
<td>With long life lithium battery for clock/ calendar maintenance</td>
<td>Same as the main meter</td>
<td>Retail Rules</td>
</tr>
<tr>
<td><strong>Time Synchronization</strong></td>
<td>Shall be crystal synchronization time-based. The internal clock shall be capable of being reset/set by the data collection software during normal collection operations.</td>
<td>Same as the main meter</td>
<td>Retail Rules</td>
</tr>
<tr>
<td><strong>Digital Display</strong></td>
<td>The meter shall have a digital display with a minimum of 5 integer digits and 3 decimal digits.</td>
<td>Same as the main meter</td>
<td>IEC, ANSI, IEEE</td>
</tr>
<tr>
<td><strong>Codes and Standards Compliance</strong></td>
<td>The meter shall adhere to established International Standards (e.g. IEC, ANSI, IEEE)</td>
<td>Same as the main meter</td>
<td>IEC, ANSI, IEEE</td>
</tr>
<tr>
<td><strong>Enclosure</strong></td>
<td>The meter shall be provided with the necessary cover to protect the internal component against the harmful elements of environment that may affect its measuring circuit and operation.</td>
<td>Same as the main meter</td>
<td>ANSI</td>
</tr>
</tbody>
</table>

2.4.3 Communication Links

The communication link to be installed shall be a dedicated line solely for the metering of the Retail Metering Services Provider.
This section provides the standards for instrument transformers located within the metering installation. With adherence to these standards, a metering installation shall be able to fully or partially comply with Retail Rules Clause 4.3.2.

2.5.1 General Requirement

A metering installation shall include instrument transformers.

2.5.2 Use of Instrument Transformers

Instrument transformers supplying the revenue meter shall be used solely for the purposes of revenue metering and not for any other purposes, such as, but not limited to, the attachment of other devices. Moreover, the following schemes shall not be allowed:

a) The use of an instrument transformer for two or more metering points

b) Paralleling of current transformers

2.5.3 Instrument Transformer Ratios

2.5.3.1 Selection of Current Transformer Ratios

Current transformer ratios shall be selected according to the following factors:

a) The maximum sustained primary current in a current transformer shall not exceed the primary tap multiplied by the primary factor of the current transformer; and

b) The minimum sustained primary current during normal operation shall not be less than 10% of the primary tap.

2.5.3.2 Selection of Voltage Transformer Ratios

Voltage transformer ratios shall be selected such that operation at the minimum or maximum sustained secondary voltage shall not affect meter accuracy or meter function.

2.5.4 Accuracy Requirements

2.5.4.1 Current Transformers

Current transformers shall conform to the IEC 44-1 Class 0.2 or ANSI C57.13 Class 0.3 or better of any instrument transformer.
2.5.4.2 Voltage Transformers

Voltage transformers shall conform to the IEC 6044-2 Class 0.2 or ANSI C57.13 Class 0.3 of any instrument transformer.

2.5.4.3 Accuracy Tests

2.5.4.3.1 Requirements

Where accuracy tests are required, they shall comply with the following requirements:

a) Tests shall be carried out by a third-party testing agency using equipment traceable to International Standards;

b) Tests shall be conducted with the suitable burdens connected to each current transformer;

c) Additional tests shall be conducted at other suitable burdens if the existing burden is expected to change in the future;

d) Tests shall include ratio and phase-angle error tests;

e) Ratio and phase-angle tests of current transformers shall be measured over a range of secondary current from 1% of rated primary current up to and including the maximum current as defined by the rating factor; and

f) Test results shall provide correction factors to be applied to both active and reactive power at each test point.

2.5.4.3.2 Instrument Transformer Burdens

Burden shall include the following considerations:

a) Every device connected to every instrument transformer;

b) The burden imposed by each device; and

c) The size of the conductors in the secondary cabling and the length of the path followed by the cabling.

2.5.4.3.2.1 Current Transformers Burden Calculation

The burden calculation for a current transformer shall include:

a) The impedance of the secondary wiring;
b) The impedance of all devices connected to the current transformer;

c) The apparent impedance associated with the interconnection of current transformer secondaries;

d) The apparent impedance associated with the sharing of a common current path through a measuring device with another current transformer;

e) The apparent impedance associated with the sharing of an approved common-return conductor;

f) The apparent impedance associated with the impedance of any other current transformer(s) connected in parallel with subject instrument transformer;

g) Burden under balanced power system conditions; and

h) Worst-case unbalance, including single-phase power

The measurement of calculation shall verify that actual burdens in service do not exceed the nameplate rated burden limits for the IEC 44-1 Class 0.2 or ANSI C57.13 Class 0.3 of any instrument transformer.

2.5.4.3.2.2 Voltage Transformers Burden Calculation

The burden calculation for a voltage transformer shall include the apparent power and power factor at the secondary terminals of the instrument transformer.

The measurement of calculation shall verify that actual burdens in service do not exceed the nameplate rated burden limits for IEC 6044-2 Class 0.2 or ANSI C57.13 Class 0.3 of any instrument transformer.

2.5.5 Safety Requirements and Grounding System

A metering installation shall conform to the requirements of:

a) Philippine Electrical Code; and


2.5.6 Technical Specifications

This section provides the minimum technical specifications of current transformers, voltage transformers of the main meter, as well as the lightning arresters connected to the meter.
2.5.6.1 Current Transformer

Current transformer installed at the main meter shall meet the minimum requirements listed in Table 2.

Table 2. Minimum Technical Specifications for Current Transformers.

<table>
<thead>
<tr>
<th>ITEMS</th>
<th>SPECIFICATIONS</th>
<th>REFERENCE DOCUMENTS</th>
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<tbody>
<tr>
<td>Type</td>
<td>Outdoor Type; Minimum oil filled, Dry Type or Gas-filled</td>
<td></td>
</tr>
<tr>
<td>Cooling</td>
<td>Oil immersed, Self-cooled; Butyl, Cast resin</td>
<td></td>
</tr>
<tr>
<td>Construction</td>
<td>Single phase, wound type, free standing</td>
<td></td>
</tr>
<tr>
<td>Accuracy Class</td>
<td>IEC 44-1 Class 0.2 /ANSI C57.13 Class 0.3 or better</td>
<td></td>
</tr>
<tr>
<td>Burden</td>
<td>Shall not exceed the rated burden limit of 12.5 VA for the IEC 44-1 Class 0.2 /ANSI C57.13 Class 0.3 (Refer to Table 1 of the Appendix of the WESM Manual on Metering Standards and Procedures)</td>
<td></td>
</tr>
<tr>
<td>Rated Primary Current</td>
<td>The thermal rating factor shall not be less than 1.0.</td>
<td></td>
</tr>
<tr>
<td>Secondary Current</td>
<td>1A or 5A</td>
<td>IEC 4.2 Standard values of rated secondary currents</td>
</tr>
<tr>
<td>Rating Factor</td>
<td>Minimum of 1.0 at 30°C</td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>60 Hz</td>
<td></td>
</tr>
<tr>
<td>Ambient Air Temperature</td>
<td>-5°C and 50°C for very hot climate</td>
<td>IEC 3.2.1 1996</td>
</tr>
<tr>
<td>BIL</td>
<td>Refer to Table 2 of the Appendix of the WESM Manual on Metering Standards and Procedures for applicable BIL</td>
<td></td>
</tr>
<tr>
<td>Creepage Distance</td>
<td>Refer to Table 3 of the Appendix of the WESM Manual on Metering Standards and Procedures for applicable creepage distance</td>
<td></td>
</tr>
<tr>
<td>Number of Core</td>
<td>At least two (2) metering core</td>
<td></td>
</tr>
</tbody>
</table>

13 Issue 7.0 WESM-MSDM-MM-07
ITEMS | SPECIFICATIONS | REFERENCE DOCUMENTS
---|---|---
Mounting | Depend on the applications | |
Grounding | Must have adequate grounding | |
Security | Seal holder shall be provided to the CT secondary terminal box | |

2.5.6.2 Voltage Transformer

*Voltage transformer* installed at the main *meter* shall meet the minimum requirements listed in Table 3.

Table 3. Minimum Specifications for Voltage Transformers.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>SPECIFICATIONS</th>
<th>REFERENCE DOCUMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Outdoor Type; Minimum oil filled, Dry Type or Gas-filled</td>
<td></td>
</tr>
<tr>
<td>Cooling</td>
<td>Oil immersed, Self-cooled; Butyl, Cast resin</td>
<td></td>
</tr>
<tr>
<td>Construction</td>
<td>Single phase, Inductive type, single bushing</td>
<td></td>
</tr>
<tr>
<td>Termination</td>
<td>Line-to-ground</td>
<td></td>
</tr>
<tr>
<td>Accuracy Class</td>
<td>IEC 6044-2 Class 0.2 / ANSI C57.13 Class 0.3 or better</td>
<td></td>
</tr>
<tr>
<td>Burden</td>
<td>Shall not exceed the rated burden limit for the IEC 6044-2 Class 0.2 / ANSI C57.13 Class 0.3 or better. (Refer to Table 4 of the Appendix of the WESM Manual on Metering Standards and Procedures(^{14}))</td>
<td></td>
</tr>
<tr>
<td>Ratio</td>
<td>Refer to Table 5 of the Appendix of the WESM Manual on Metering Standards and Procedures(^{14})</td>
<td></td>
</tr>
<tr>
<td>Secondary Voltage</td>
<td>Refer to Table 5 of the Appendix of the WESM Manual on Metering Standards and Procedures(^{14})</td>
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<tr>
<td>Frequency</td>
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<tr>
<td>Operating Temperature</td>
<td>55°C average ambient temperature, with max ambient temperature not exceeding 65°C</td>
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</tr>
<tr>
<td>BIL</td>
<td>Refer to Table 2 of the Appendix of</td>
<td></td>
</tr>
</tbody>
</table>

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2.5.6.3 Lightning Arrester

Lightning Arrester installed at the main meter shall meet the minimum requirements listed in Table 4.

<table>
<thead>
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<td>[KV]</td>
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<td>[KV]</td>
<td>[KA]</td>
<td>IEC Station</td>
<td>[KVA]</td>
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<td>420</td>
<td>20</td>
<td>CL 4 Station</td>
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</table>

2.5.7 Primary Connections

2.5.7.1 Location of Primary Terminals

2.5.7.1.1 Current Transformer

The primary terminals of each current transformer shall be located as close as practicable to the metering point.

2.5.7.1.2 Voltage Transformer

The primary terminals of each voltage transformer shall be:

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a) At the same potential as the current transformer; and

b) As close as practicable to the primary terminals of the current transformer of the same phase

2.5.7.2 Connection to Power System

With respect to any physical separation of the points at which the voltage transformer and the current transformer of each phase are connected to the power system, the metering installation shall:

a) Minimize the voltage drop between the voltage transformer and the current transformer; and

b) Minimize the leakage current between the voltage transformer and the current transformer.

2.5.7.3 Location/Arrangement of Instrument Transformers

With respect to the physical arrangement of the instrument transformers, the current transformer shall be located at the load side based on the normal flow of current (Refer to Figure 3 of the Appendix of the WESM Manual on Metering Standards and Procedures).**

2.5.7.4 Distances, clearances between Instrument Transformers

The distances between instrument transformers and the prescribed clearances shall follow the distances and clearances shown in Table 6 and Figure 4 of the Appendix of the WESM Manual on Metering Standards and Procedures.

2.5.7.5 Primary Cable

2.5.7.5.1 Quality of Materials and Workmanship

The primary cable terminations connected to the high-voltage terminals of an instrument transformer shall be in good quality and of accepted workmanship.

2.5.7.5.2 Electrical Location of Primary Connections

Primary connections of the instrument transformer shall be located such that operation of power system equipment does not degrade the following elements:

a) Accuracy of measurement;

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b) Data required for validation or settlement;
c) Loss adjustment factors; and
d) Monitoring of metering equipment condition.

2.5.8 Secondary Connections

2.5.8.1 Size of Secondary Cabling

2.5.8.1.1 Current Transformer

The secondary cabling between the current transformers and the meter test switch/block shall be of a sufficient size that the rated burden for the IEC 0.2 or ANSI 0.3 accuracy class is not exceeded when rated current flows in the secondary winding.

2.5.8.1.2 Voltage Transformer

The secondary cabling between the voltage transformers and the meter test switch/block shall be of correct size such that the voltage drop in each phase does not exceed 0.2 V.

2.5.8.2 Codes and Conditions

Instrument transformer secondary cabling and cabling accessories shall comply with the following codes and conditions:

a) The Philippine Electrical Code;
b) The main meter shall be supplied from dedicated current transformers used for no other purpose;
c) Voltage transformers with one secondary winding shall be dedicated to the main meter and used for no other purpose;
d) Voltage transformers with more than one secondary winding shall have one winding dedicated to the main meter and shall be used for no other purpose;
e) Electrical connection to the instrument transformer secondary terminals shall not be outside of the meter box;
f) Cabling from the instrument transformers to the meter enclosure shall be routed in dedicated conduit, and the route shall be visually traceable; and
g) Each secondary terminal of each instrument transformer shall be brought to the test block on a separate conductor.

2.6 SECURITY OF METERING INSTALLATIONS AND DATA

This section provides the security standards for metering installations and its metering data. With adherence to these standards, a metering installation shall be able to fully or partially comply with Retail Rules Clause 4.3.2.3.

2.6.1 Physical Security

A metering installation shall be secure, tamper-proof, and conforms to the following applicable security requirements:

2.6.1.1 Instrument Transformers Connections

Secondary cabling shall be secured, tamper-proof, and compliant with the Distribution Code requirements on the security of registered revenue metering installations and metering data.

2.6.1.2 Conduit Systems

All wiring from the secondary terminal box of instrument transformers to the meter box shall be placed in a conduit, which is compliant with environmental requirements, to ensure that the cabling is secure, tamper-proof, and compliant with the Central Registration Body Requirements. Conduit joints (i.e., elbow, T-connector) shall be properly sealed and secured. No secondary cabling shall be exposed and accessible to unauthorized personnel.

2.6.1.3 Secondary Terminal Box

Secondary terminal boxes of the current transformers and voltage transformers shall be sealed and placed as far as practicable to ensure the detection of unauthorized access to the instrument transformer connections.

2.9.1.4 Meter Enclosure

All meters, test links, and communication equipment shall be contained within a meter enclosure. The meter enclosure shall comply with the following requirements:

a) The meter enclosure shall be secured by the Retail Metering Services Provider;

b) The Retail Metering Services Provider shall have access to the meter enclosure at all times;
c) Persons other than the Retail Metering Services Provider shall not be given access to the meter enclosure;

d) The meter enclosure shall be padlocked and sealed as far as practicable in a manner approved by the Central Registration Body; and

e) The meter enclosure shall be weatherproof.

2.6.1.4 Meter Test Block/Switch

Meter test block/switch shall be installed inside the meter enclosure to allow the current and voltage from each instrument transformer and meter to be individually determined. The meter test block/switch shall have the following technical description:

a) Test Points: 10 points, (4 potential & 6 current Points)
b) Pole Arrangement: P-CC-P-CC-P-CC-P
c) Rating: 600 VAC, 20 Amperes
d) Current carrying parts are made of non-tarnishing nickel silver
e) Switches are of the open knife-blade type
f) Current switch poles are provided with an auto-shorting jaw and the other has a shunted jack which is adaptable to a test plug
g) Base is a one piece resistant moldings

The meter test block/switch shall also be provided with the standard cover: a one-piece molded high-impact styrene removable cover.

2.6.1.5 Meter Seals and Padlock

2.6.1.5.1 Meter Seal Requirements

The requirements for meter seals are:

a) Seals shall have unique serial numbers
b) Seals shall be traceable to the Retail Metering Services Provider or Energy Regulatory Commission personnel that installed the seals
2.6.1.5.2 Padlock Requirements

The requirements for padlocks are:

a) Padlock shall be heavy duty;

b) Padlock shall have only one security key and placed on a secured area;

c) Security key shall be controlled by Retail Metering Services Provider; and

d) Use of security key shall be documented and monitored.

2.6.1.6 Metering Perimeter

The metering installation shall be secured by a perimeter fence, if applicable, and its gate properly padlock, sealed and secured. Metering perimeter shall also be well-lighted and free from any unwanted materials, equipment, vegetation, and other entities.

2.6.2 Metering Data Security

a) Each Contestable Costumer, through its Retail Metering Service Provider, shall ensure that the metering data recorded in each metering installation is protected from direct local or remote electronic access, including during the transfer of such metering data to the communication interface of the metering database. The Retail Metering Service Provider shall implement suitable passwords and other security controls.

b) The Retail Metering Service Provider shall protect the metering data during delivery to the Central Registration Body other than electronic means and from access by persons other than itself regardless of the medium such as, but not limited to, diskettes, CDs or paper on or in which such metering data is transcribed, transferred or stored for purposes of such delivery.

c) Each Retail Metering Service Provider shall keep all records of passwords for electronic access to metering data confidential.
d) The Retail Metering Service Provider shall provide, for each metering installation, passwords to the Central Registration Body providing read-only access.

e) The Retail Metering Service Provider may, or at the request of the Central Registration Body shall, change one or more of the passwords relating to a metering installation in which it is the Retail Metering Service Provider.

2.7 REDUNDANT METERING INSTALLATION

A metering installation shall have a redundancy which can be achieved in two ways:

a) Dual metering using two independent sets of instrument transformers approved by the Central Registration Body where the main instrument transformers are connected to the main meter and the alternate instrument transformers are connected to the backup meter; or

b) Partial redundant metering using a single set of instrument transformers approved by the Central Registration Body where both the main and backup meters are connected to either common or separate core.

2.7.1 Minimum Requirement

The minimum requirement is partial redundant metering using single set of instrument transformer approved by the Central Registration Body where the main and backup meters are in series or in parallel and connected to a common core.

2.7.2 Minimum Metering Data Deviation

The metering data recorded by the main and backup meters shall not deviate by more than ±0.6%. In the event that the deviation exceeds this value, the Retail Metering Service Provider shall immediately investigate and correct the causes of such deviations.

2.8 EXISTING METERING INSTALLATIONS

An existing metering installation that does not fully comply with the requirements of this Manual shall be permitted by the Central Registration Body to remain in service subject to the following conditions:

a) The meter has a mass memory capable of recording 15-minute demand interval and have communication ports for remote and manual data retrieval;
b) The Energy Regulatory Commission has tested or verified and sealed the meter;

c) All non-compliant meters shall be replaced within six (6) months from the effectivity of its registration in the WESM.

d) All non-compliant instrument transformers shall be replaced within the period of two (2) years from the effectivity of registration in the WESM.
SECTION 3 SITE EQUIPMENT IDENTIFICATION NUMBER (SEIN)

3.1 COVERAGE

This section describes the standard numbering system that Retail Metering Services Providers must follow when numbering and identifying their metering installations and its individual equipment.

3.2 OBJECTIVES

The objectives of establishing a standard numbering system for identifying and numbering metering installations and its individual equipment are:

a) To facilitate the location of metering installations for administrative purposes by reflecting the geographical location of the metering installation in its Site Equipment Identification Number; and

b) To facilitate the identification of metering installations whose details are recorded in the metering database administered by the Central Registration Body under Retail Rules Clause 4.5.2;

3.3 GUIDELINES

The Retail Metering Services Providers shall follow the procedures listed in this Section when numbering and identifying metering installations and its individual equipment.

3.3.1 Basis

The specific details of these guidelines are as prescribed in the following provisions of the Distribution Code:

a) Provision 7.12.1.1
b) Provision 7.12.1.2
c) Provision 7.12.1.3
d) Provision 7.12.2.1
e) Provision 7.12.2.2
f) Provision 8.3.1
g) Provision 8.4.5

3.3.2 Metering Installation

A metering installation shall be numbered using the following convention:

WWW-XXXX-YY-CCCC-NN

Where:
WWW shall be the Standard Site ID of the Substation where the Contestable Costumer is drawing power from. Refer to Procedure No. 1 and Table 9 of the Appendix of the WESM Manual on Metering Standards and Procedures\textsuperscript{17} for the procedure on the designation and a sample list of Standard Site IDs, respectively. Note: the Standard Site ID of the Substation where the Contestable Customer is drawing power from also denotes the Market Trading Node that its metering installation shall be mapped to by the Central Registration Body.

XXXX shall be the Metered Participant ID of the Associated Grid Connection Point. Refer to Procedure No. 2 and Table 10 of the Appendix of the WESM Manual on Metering Standards and Procedures\textsuperscript{17} for the procedure on the designation and a sample list of Metered Participant IDs of Associated Grid Connection Points, respectively.

YY shall be a two (2) digit number designating the off-take grid meter.

CCCC shall be the Metered Participant ID of the Contestable Customer as referenced to its short name ID. Refer to Appendix B for the procedure on the designation of Metered Participant IDs of Contestable Customers.

NN shall be a two (2) digit number identifying the metering installation of the facility of the Contestable Customer.

Example:

ARA-MECO-01-PLDT-01

Where:

ARA Standard Site ID of Araneta S/S
MECO Metered Participant ID of Meralco
01 Grid Off-take Meter No. 1
PLDT Metered Participant ID of Philippine Long Distance Telephone Company
01 Metering Installation No. 1 of the Facility

3.3.3 Meter

A meter shall be numbered using the following convention:

BY- (WWW-XXXX-YY-CCCC-NN)

\textsuperscript{17} Issue 7.0 WESM-MSDM-MM-07
Where:

B shall be a one (1) letter initial designating the purpose of the meter. Refer to Table A-1 for the standard purpose designations of meters.

Y shall be a one (1) digit number designating the function of the meter. The standard function designations are as follows: 1 – Delivered (OUT), 2 – Received (IN), 3 – Bi-directional (IN & OUT).

(WWW-XXXX-YY-CCCC-NN) shall be the Standard Equipment Identification Number of the metering installation where the meter is located.

Example:

**R3-ARA-MEC0-01-PLDT-01**

Where:

R Main meter purpose designation
3 Bi-directional function designation
(WWW-XXXX-YY-CCCC-NN) Standard Equipment Identification Number of the metering installation where the meter is located (See sample in Section 3.3.2 for details)

### 3.3.4 Meter Box and Modem

A meter box or modem shall be numbered using the following convention:

**DD-(B-WWW-XXXX-YY-CCCC-NN)**

Where:

DD shall be the two (2) letter initial designation for the relevant metering equipment, device, or auxiliary. Refer to Table A-2 for the standard designation of metering equipment, devices and auxiliaries.

B shall be a one (1) letter initial designating the purpose of the meter. Refer to Table A-1 for the standard purpose designations of meters.

(WWW-XXXX-YY-CCCC-NN) shall be the Standard Equipment Identification Number of the metering installation where the meter is located.
Example:

**MB-(R-ARA-MEC0-01-PLDT-01)**

Where:

- **MB**: Meter Box equipment, device, or auxiliary designation
- **R**: Main meter purpose designation
- **(WWW-XXXX-YY-CCCC-NN)**: Standard Equipment Identification Number of the metering installation where the meter is located (See sample in Section 3.3.2 for details)

### 3.3.5 Meter Test Switch

A meter test switch shall be numbered using the following convention:

**DDYY-(B-WWW-XXXX-YY-CCCC-NN)**

Where:

- **DD**: shall be the two (2) letter initial designation for meter test switch. Refer to Table A-2 for the standard designations of metering equipment, devices and auxiliaries.
- **YY**: shall be a two (2) digit number designating the off-take grid meter.
- **B**: shall be a one (1) letter initial designating the purpose of the meter. Refer to Table A-1 for the standard purpose designations of meters.
- **(WWW-XXXX-YY-CCCC-NN)**: shall be the Standard Equipment Identification Number of the metering installation where the meter is located

Example:

**TS01-(R-ARA-MEC0-01-PLDT-01)**

Where:

- **TS**: Meter Test Switch equipment, device, or auxiliary designation
3.3.6 **Current Transformer**

A *current transformer* shall be numbered using the following convention:

\[
PDD-(B-XXXX-YY-CCCC-NN)
\]

Where:

- **P** shall be a one (1) letter initial designation for phase of the current transformer: A – Phase A, B – Phase B, C – Phase C
- **DD** Shall be the two (2) letter initial designation for the current transformer. Refer to Table A-2 for the standard designations of metering equipment, devices and auxiliaries.
- **B** shall be a one (1) letter initial designating the purpose of the *meter*. Refer to Table A-1 for the standard purpose designations of *meters*.
- **(WWW-XXXX-YY-CCCC-NN)** shall be the Standard Equipment Identification Number of the *metering installation* where the *meter* is located

Example:

\[
ACT-(R-ARA-MEC0-01-PLDT)
\]

Where:

- **A** Phase A of the current transformer
- **CT** Current transformer equipment, device, or auxiliary designation
- **R** Main *meter* purpose designation
- **(WWW-XXXX-YY-CCCC-NN)** Standard Equipment Identification Number of the *metering installation* where the *meter* is located (See sample in Section 3.3.2 for details)
SECTION 4 METERING INSTALLATION REGISTRATION

4.1 COVERAGE

Pursuant to Retail Rules Clause 4.3.2.1, a metering installation shall be registered in the WESM through the Central Registration Body.

This section provides the procedures to be followed by the Central Registration Body, Contestable Customers, Suppliers, and Retail Metering Services Providers for the registration of metering installations of Contestable Customers in the WESM.

4.2 OVERVIEW

In order for a metering installation to be successfully registered in the WESM, Retail Metering Service Providers must be able to demonstrate the following requirements to the Central Registration Body:

a) Metering installation for registration are compliant with the Retail Rules and Section SECTION 2 of this Manual;

b) Metering installation for registration has successfully undergone an End-to-End Test; and

c) Metering installation for registration has successfully undergone commissioning tests.

4.3 METERS FOR REGISTRATION

Main and backup meters, of revenue quality and the same accuracy class, shall be registered.

4.4 REGISTRATION PROCEDURES

4.4.1 Submission of Application Form and Pertinent Documents

To initiate the registration of a metering installation of a Contestable Customer, its Retail Metering Services Provider, on behalf of the Supplier or Contestable Customer, shall submit the following to the Central Registration Body by courier:

a) Accomplished Metering Installation Registration Form as published in the market information web site\(^{18}\) signed by both Retail Metering Services Provider and Contestable Customer;

b) Load Profile of the metering installation during the previous twelve (12) months as well as its maximum and minimum hourly demand;

\(^{18}\) www.wesm.ph
c) Single Line Diagrams from the off-take meter or grid meter to the metering point of the Contestable Customer;

d) Certification on Meter Test Results from the Energy Regulatory Commission with its corresponding seal;

e) Retail Metering Services Provider test and calibration reports of instrument transformers and meters;

f) Pro-forma Agreement between the Contestable Customer or Supplier and its Retail Metering Services Provider; and

g) Documentation of other special features of the meter.

4.4.2 Validation of Documents

Upon receipt of the Metering Installation Registration Form, the Central Registration Body shall inspect and validate the submitted documents for completeness and conformance to the standards established in Section SECTION 2 of this Manual.

4.4.2.1 Conformance to Requirements

If the Central Registration Body deems that the submitted documents are conformant and indicates conformance to its requirements, the Central Registration Body shall notify the Retail Metering Services Provider of the conformance through fax, mail, or e-mail.

4.4.2.2 Non-conformance to Requirements

4.4.2.2.1 Notification

If the Central Registration Body deems that the submitted documents are non-conformant or indicates a non-conformance to its requirements, the Central Registration Body shall request the relevant Retail Metering Service Provider to provide further clarifications by sending a notification either through fax, mail, or e-mail.

4.4.2.2.2 Resubmission of Documents

To proceed with the registration process, the Retail Metering Services Provider shall resubmit all necessary documents requested by the Central Registration Body through mail or courier.

4.4.3 Testing
Retail Metering Standards and Procedures

In addition to the transmittal of the notification of conformance to the Retail Metering Services Provider, the Central Registration Body shall also request the Retail Metering Services Provider to perform commissioning tests and subsequent End-to-End Test on the metering installation for registration.

Upon notification from the Central Registration Body, the Retail Metering Services Provider shall then conduct the required tests.

4.4.3.1 Ready for Operation

When the metering installation for registration satisfactorily passes all required tests, the Retail Metering Services Provider shall submit all relevant reports to the Central Registration Body. Upon receipt of the reports, the Central Registration Body shall deem the metering installation ready for operation.

4.4.3.2 Failure of Tests

If the metering installation for registration fails any of the required tests, the Retail Metering Services Provider shall be responsible for rectifying all uncovered problems on the metering installation. Upon correction of the uncovered problem, the metering installation shall again be subjected to the test that it failed until it passes all required tests.

4.4.4 Approval of Application

Upon receipt of all documents indicating the conformance of the metering installation for registration to the standards in this Manual and passing of all required tests, the Central Registration Body shall issue its approval to the metering installation for registration, update its registry, and publish the newly registered metering installation of the Retail Metering Service Provider in the market information web site19.

19 www.wesm.ph
SECTION 5 METERING DATA COLLECTION

5.1 COVERAGE

Pursuant to Retail Rules Clause 4.4.2.1, the Retail Metering Services Provider, on behalf of its associated Supplier or Contestable Customer, shall retrieve the metering data from the meter and transmit the metering data to the Central Registration Body.

This section provides the procedures to be followed by the Central Registration Body, Contestable Customers, Suppliers, and Retail Metering Services Providers in the collection and submission of metering data to the Central Registration Body.

5.2 DATABASES

5.2.1 Metering Database

Pursuant to Retail Rules Clause 4.5.2.1, the Central Registration Body shall create, maintain and administer a metering database, which shall include a metering register containing information for each metering installation registered with the Central Registration Body.

5.2.1.1 Data Inclusions

The metering database shall include metering data, energy data, data substituted in accordance with Retail Rules Section 4.6, and all calculations made for settlement purposes.

5.2.1.2 Storage Duration

Furthermore, data shall be stored in the metering database:

a) For sixteen (16) months in accessible format; and

b) For ten (10) years in archive.

5.2.1.3 Access

The only entities entitled to have either direct or remote access to metering data on a read-only basis from the metering database or the metering register in relation to a metering point are:

a) Each Supplier whose settlement amounts are determined by reference to quantities of energy flowing through that metering point,
5.2.2 **Installation Database**

Pursuant to *Retail Rules* Clause 4.5.1.1, a *Retail Metering Services Provider* shall create, maintain and administer an *installation database* in relation to all its *metering installations*.

### 5.2.2.1 Data Inclusions

The *installation database* shall include *metering data*, energy data, and, if necessary, data substituted.

### 5.2.2.2 Access

In accordance with *Retail Rules* Clause 4.5.1.2, a *Retail Metering Services Provider* shall ensure that each affected *Supplier*, *Distribution Utility*, and *Contestable Customer* as well as the *Central Registration Body* is given access to the information in its *installation database* at all reasonable times and:

b) The *Retail Metering Services Provider* who is responsible for the *metering installation* at that *metering point*,

c) The *Central Registration Body* and its authorized agents,

d) The *Market Operator* and its authorized agents,

e) Any *Contestable Customer* with respect to the metering data in relation to the *metering point* registered to it,

f) Any *Distribution Utility* with respect to *Contestable Customers* whose facilities are located in its franchise area and for whom said *Distribution Utility* is not the *Retail Metering Services Provider*,

g) The *Market Surveillance Committee*,

h) The *Enforcement and Compliance Office*,

i) The *Market Assessment Group*,

j) The *PEM Auditor*,

k) The *Department of Energy*, and

l) The *Energy Regulatory Commission*. 
5.3 COLLECTION AND SUBMISSION PROCEDURE

This section provides the process for the collection and submission to the Central Registration Body of metering data.

5.3.1 Requirements

5.3.1.1 Data

The metering data shall contain the following:

- **Data**
  - a) Date and time, or time series, of the meter readings received for each Contestable Customer meter,
  - b) Active energy (kWh), active power (kW), reactive energy (kVARh), and reactive power (kVAR) data in 15-minute resolution with assigned channel number, and
  - c) Site Equipment Identification Number of the meter.

5.3.1.2 Format

The Retail Metering Services Provider shall submit the metering data in the meter data exchange format prescribed by the Central Registration Body.

5.3.1.3 Timing

Pursuant to Retail Rules Clause 4.3.8, all meter clocks shall be synchronized by the Retail Metering Services Provider to Philippine Standard Time (PST) to ensure accuracy of settlements.

5.3.2 Daily Process

5.3.2.1 Collection

At a fifteen-minute resolution, the meter at the metering point of a Contestable Customer continuously records metering data. Immediately at the end of the trading day, the Retail Metering Services Provider shall collect the metering data and event
log of the whole trading day from each meter, identified by its Recorder ID (SEIN) and Device ID (Serial Number), of all its associated Contestable Customers.

The metering data is automatically collected daily by the Meter Data Retrieval System of the Retail Metering Services Provider which is directly connected to the meter.

5.3.2.2 Submission

The Retail Metering Services Provider shall submit the collected metering data of the trading day to the Central Registration Body at 0400H of the succeeding trading day.

5.3.2.2.1 Normal

The Meter Data Retrieval System of the Retail Metering Services Provider automatically exports the metering data of all its associated Contestable Customers to the Meter Data Collection System of the Central Registration Body daily through file transfer protocol.

In the event that no metering data was received by 0800H, the Central Registration Body shall immediately call the Retail Metering Services Provider to resend the data through the same method.

Upon receipt, the Meter Data Collection System of the Central Registration Body converts the metering data to the required file format for use in settlement.

5.3.2.2.2 Communication Failure

In case of communication failure between a meter and its Meter Data Retrieval System, the Retail Metering Services Provider shall retrieve the metering data from the meter manually through a meter reader handheld device or laptop. The metering data shall then be uploaded to the Meter Data Retrieval System of the Retail Metering Services Provider for export to the Meter Data Collection System of the Central Registration Body.

5.3.3 Monthly Process

Not later than three (3) business days after the end of the billing period, the Retail Metering Services Provider shall submit a monthly preliminary CD containing all metering data of all metering points of its associated Contestable Customers. In addition to the CD, Retail Metering Services Provider shall also submit a transmittal letter that includes a tabulation of all associated metering points and their corresponding total metered quantity for the billing period.

In the event that metering data errors are detected by the Central Registration Body in accordance with Section SECTION 6 of this Manual, the Retail Metering Services
5.4 EMERGENCY PROCEDURES

This section provides the procedural steps to be followed in case of a failure of the Meter Data Retrieval System of the Retail Metering Services Provider or an emergency situation that requires the transfer of the metering data processing operations of the Central Registration Body from the Main Server to the Emergency Back-up System (EBS).

5.4.1 Failure of the Meter Data Retrieval System

In case of a failure of the Meter Data Retrieval System of the Retail Metering Services Provider,

a) The Retail Metering Services Provider shall:

i. Inform the Central Registration Body of the occurrence of a failure of its Meter Data Retrieval System;

ii. Perform emergency restoration of its Meter Data Retrieval System;

iii. While the Meter Data Retrieval System is out of service, retrieve all required metering data using alternative methods of retrieval and submit it within seven (7) days to the Central Registration Body in a file format that is compatible with the system of the Central Registration Body. For this purpose, the Retail Metering Services Provider may use a backup Meter Data Retrieval System, if it is available, or retrieve the metering data on-site or remotely using the appropriate software;

iv. Inform the Central Registration Body when its Meter Data Retrieval System is ready to resume normal operation; and

v. Resume normal retrieval and transmittal of metering data using the Meter Data Retrieval System.

b) The Central Registration Body shall, upon receipt of the metering data, perform Validation, Estimation and Editing (refer to Section SECTION 6 of this Manual), process the metering data for billing and settlement, and upload the metering data to the metering database.

5.4.2 Transfer to Emergency Back-up System
In the event that an emergency situation that requires the transfer of the metering data processing operations of the Central Registration Body from the Main Server to the Emergency Back-up System (EBS),

a) The Central Registration Body shall:

   i. Inform the Retail Metering Services Providers, Suppliers, and the Contestable Customers of the need to transfer operations from the Main Server to the Emergency Back-up Site;

   ii. Instruct Retail Metering Services Providers to transmit metering data to the Emergency Back-up Site;

   iii. Activate the Emergency Back-up Site, upload the metering data, and perform Validation, Estimation and Editing process for billing and settlement;

   iv. Perform emergency restoration of its Main Server;

   v. When the operations are ready to resume at the Main Server, inform the Retail Metering Services Providers to resume metering data transmittal to the Main Server; and

   vi. Resume operations at and upload the metering data to the Main Server, and perform Validation, Estimation and Editing process for billing and settlement.

b) The Retail Metering Services Provider shall:

   i. Transmit the metering data to the Emergency Back-up Site of the Central Registration Body when instructed; and

   ii. Resume transmittal of metering data to the Main Server of the Central Registration Body when informed.
SECTION 6 DATA VALIDATION, ESTIMATION AND EDITING

6.1 COVERAGE

Pursuant to Retail Rules Clause 3.3.5.3(c), the Central Registration Body shall develop and publish the methodologies and procedures for determining metered quantity by using historical load profiles.

This section provides the methodologies and procedures for validating, estimating, and editing metering data for the determination of the metered quantity of a Contestable Customer in accordance with Retail Rules Section 3.3.5.3.

Furthermore, this section discusses the obligations of the Retail Metering Services Providers in the validation, estimation, and editing of metering data as stipulated in Retail Rules Section 4.6.2.

6.2 GENERAL DESCRIPTION

All metering data received by the Central Registration Body shall be evaluated using the Validation, Estimate and Editing process described in this section. When metering data contains missing values, uncertain values, or exceeds the maximum or minimum of the daily hourly load profile values of the registered meter, such metering data shall undergo estimation and editing wherein substitutions of metering data shall be made using historical data.

The Central Registration Body shall issue a Meter Trouble Report for all metering data that fails the validation component of the Validation, Estimate and Editing process. When Meter Trouble Reports are issued, the Central Registration Body shall give instructions to the concerned Distribution Utility or Retail Metering Service Provider who shall investigate the meter trouble and subsequently provide a report to the Central Registration Body. The concerned Retail Metering Services Provider shall then correct the meter data. Procedures regarding Meter Trouble Reports are described in more detail in Section SECTION 7 of this Manual.

6.3 VALIDATION PROCEDURES

This section provides the procedures to be followed by the Central Registration Body and the Retail Metering Service Providers in the daily and monthly validation processes.

6.3.1 Daily Validation

6.3.1.1 Validation Error Categories

The Central Registration Body shall perform several checks upon receipt of metering data. These checks are described further in Section 6.3.1.2. Metering data that fails the checks will be reported according to four (4) error categories:
a) Uncertain Value
b) Missing Values
c) Outside Historical Min/Max
d) Orphan values

6.3.1.2 Validation Checks

The following checks shall be performed by the Central Registration Body for the above validation error categories:

a) Check for uncertain values.
b) Check for missing values.
c) Check for values in the metering data which fall outside the maximum and minimum range of the historical data. The historical data used in this check are as follows:
   i. Value during the same hour last week,
   ii. Value during the same hour the previous day, and
   iii. Average of the values during the whole previous day.
d) Check for values in the metering data whose meter is not registered in the Central Registration Body.

6.3.1.3 Meter Trouble Report

In cases where a metering data error is detected, the Central Registration Body shall issue a Meter Trouble Report to the concerned Retail Metering Services Provider. Further details are provided in Section SECTION 7 of this Manual.

6.3.1.4 Validation Reporting

The Central Registration Body shall prepare a daily validation report containing the errors encountered for the day and their respective category.

6.3.2 Monthly Validation

In addition to the daily validation, the Central Registration Body shall also validate the monthly metering data sent to the Central Registration Body by the Retail Metering Services Providers. The procedure for the monthly validation is as follows:
a) The Retail Metering Services Provider shall submit a preliminary CD in accordance with Section 5.3.3 of this Manual. The preliminary CD must have no missing values;

b) The Central Registration Body shall compare the values contained in the CD to the daily metering data of each metering point earlier submitted by the Retail Metering Services Provider. If there are discrepancies between the values, a Meter Trouble Report (refer to Section SECTION 7) shall be issued to the Retail Metering Services Provider;

c) If issued a Meter Trouble Report, a Retail Metering Services Provider shall correct the metering data and submit a final CD not later than five (5) business days prior to the issuance of the final settlement statement; and

d) All CDs shall be formally transmitted to the Central Registration Body with a cover letter identifying all the metering points, through their Standard Equipment Identification Number, in the CD and their respective total monthly metering data.

6.3.3 Validation of Off-Take Meters

The Central Registration Body shall, on a daily and monthly basis, validate the assignment of off-take meters to facilities of Contestable Customers. In this validation, the metered quantity of an off-take meter is checked against the aggregate metered quantity of all facilities of Contestable Customers assigned to the off-take meter. The metered quantity in the off-take meter shall be greater than the aggregate metered quantity of all facilities of Contestable Customers assigned to the off-take meter.

If the aggregate metered quantity of all facilities of Contestable Customers assigned to the off-take meter exceeds the metered quantity at that off-take meter, the Central Registration Body shall facilitate the re-assignment of off-take meters.

6.3.4 Metering Installation Validation Tests

Pursuant to Retail Rules Clause 4.6.2.1, in case of metering data error, the Retail Metering Services Provider shall perform validation, estimation and editing in order to derive corrected metering data. This section provides the validation tests that a Retail Metering Services Provider shall perform on its metering installations.

6.3.4.1 Current and Voltage Check

This indicator detects the loss of voltage and/or current input to the meter due to failure of the supply from one or more instrument transformers or tampering.
6.3.4.2 Load Profile vs. Meter Reading

These checks for corruption related to the meter multiplier.

6.3.4.3 Intervals Found vs. Interval Expected

Check for missing intervals.

6.3.4.4 Time Synchronization

Checks for synchronism of meter clock to Philippine Standard Time/Data Collection System time.

6.3.4.5 Number of Power Outage Intervals

This indicator allows periods of zero primary power to be identified.

6.3.4.6 Cyclic Redundancy Check / Read-Only Memory / Random Access Memory

This is part of the internal components of a meter, which is automatically flagged when failing.

6.3.4.7 Meter Clock Overflow

Flag generated by the meter indicating failure of internal electronics.

6.3.4.8 Hardware Reset

Flag generated by the meter indicating failure of internal electronics.

6.3.4.9 Time Reset

Indicates the interval in which the meter clock time has been changed creating either a shorter or longer interval.

6.3.4.10 Data Overflow on Interval

This indicates that the meter is creating more pulses than it can record in an interval or Data Collection System (DCS) can accommodate in an interval.

6.3.4.11 Number of Channels

The actual number of data channels from the meter does not match the number expected at the data collection System.
6.3.4.12 Changed Device ID

The internal device identifier does not match the value registered at the data collection system.

6.3.4.13 Watchdog Time Out

This is the failure of the meter to return data in response to a poll within the required time frame. This is reported by some recorders when a watchdog register is tripped or activated.

6.3.4.14 Parity Error

This indicator determined by a parity error bit that is set by a recorder on a channel of data during status check or read/write function.

6.3.4.15 Event Log Check

Checks error messages and alarms recorded by the meter.

6.4 ESTIMATION PROCEDURES

In accordance with Retail Rules Section 3.3.5.3(a), if no metering data is submitted by the relevant Retail Metering Services Provider in accordance with the billing and settlement timetable, the Central Registration Body shall determine the metered quantity of a facility of a Contestable Customer using the historical load profiles of that facility of a Contestable Customer.

6.4.1 Daily Process

The Central Registration Body, upon detection of a metering error in the daily metering data submitted by the Retail Metering Services Providers, shall estimate the metering data on a daily basis.

6.4.1.1 Uncertain Value Checking

Any value in the metering data that falls outside the maximum and minimum range of the metering data as recorded in the registry of the Central Registration Body metering system shall be marked with the status ‘uncertain’. Metering data with values with ‘uncertain’ status are estimated using the following:

6.4.1.1.1 Historical Values

The values with ‘uncertain’ status may be replaced using the following historical data:

a) Value during the same hour last week,
b) Value during the same hour the previous day, and

c) Average of the values during the whole previous day.

6.4.1.1.2 Backup Meter

The values with ‘uncertain’ status may be replaced with the values from the backup meter during the same hour.

6.4.1.1.3 Previous Hour Data

The values with ‘uncertain’ status may be replaced using the reading from the previous hour.

6.4.2 Monthly Process

This section details the procedures conducted monthly for estimating metering data for the determination of the metered quantity of a Contestable Customer.

6.4.2.1 Interpolation of Metering Data

If metering data are missing on one (1) to four (4) consecutive fifteen-minute intervals, metering data shall be estimated by means of interpolation between the available intervals.

6.4.2.2 Back-up Meter Data

If more than four (4) fifteen-minute intervals are missing, data from the backup meter can be directly substituted for the missing data from the main meter provided that the historical difference of metering data between the main and backup meters does not exceed more than ±0.6%. If the average deviation exceeds ±0.6%, a correction factor shall be applied using the historical difference between the main and backup meters.

6.4.2.3 From Grid Off-Take Meter

If both the main and backup meters fail, the metering data on the metering point of the facility of the Contestable Customer shall be estimated using the metering data from its grid off-take meter. The load profile of the grid off-take meter of the Contestable Customer shall be adjusted using a historical factor obtained through the comparison of the historical grid off-take metering data and historical main metering data. The following guidelines shall be followed in performing this estimation:

a) The hourly equivalent metering data shall be computed proportionately according to the load profile obtained from available grid off-take
metering data corresponding to the metering point for the time covered by the register readings; and

b) The metering data of the facility of the Contestable Customer shall be proportionate to the grid off-take meter using historical factor.

6.4.2.4 Scientific Method of Estimation

If there is a loss of one of the phase voltages and currents, estimation shall be performed through the scientific method of calculation using the average remaining phase voltages or currents of good data from the historical load profile.

6.4.2.5 Historical Meter Data

If the above methods do not provide reasonable values, the following historical data from the main meter may be used for estimating missing values:

a) Values during the same hour of the previous day with the same day type (i.e., weekday or weekend),

b) Values during the same hour of the same day last week recorded by the same meter (i.e. Saturday, Sunday, Holidays), and

c) Average value of the values during the same hour of the same day of the three (3) previous weeks recorded by the same meter.

6.4.2.6 Other Technical Methods

Other technical methods proposed and submitted by the Retail Metering Services Providers may be considered by the Central Registration Body.

6.5 EDITING PROCEDURE

The Central Registration Body shall update the metering data in the metering database to correct the values submitted by the Retail Metering Services Provider. This update shall include actual metering data obtained as well as estimated metering data from the main and back-up meters within the required period.

6.6 APPROVAL AND EXPORTING

The Central Registration Body shall approve all received metering data before they are used in the settlement process. These metering data shall have been reviewed and verified using the methods discussed in Section 6.3 and 6.4. Settlement-ready metering data shall be exported to the settlement process and only approved data are transferrable.
7.1 COVERAGE

This section provides the details and procedures in relation to the Meter Trouble Report and its issuance.

7.2 INITIATION

A Meter Trouble Report may be initiated due to the following:

a) A metering data error is detected through the validation process described in Section 6.3 of this Manual; or

b) A Retail Metering Services Provider, a Contestable Customer, or a Supplier requests the Central Registration Body to issue a Meter Trouble Report to the Retail Metering Services Provider due to difficulties in communicating with a metering installation, or validation of metering data. Where the Central Registration Body determines that a Meter Trouble Report is not required, it shall notify the Retail Metering Services Provider, Contestable Customer, or Supplier of its decision within twenty-four (24) hours.

7.3 ISSUANCE

The Central Registration Body shall issue a Meter Trouble Report to the concerned Retail Metering Services Provider and, for information, its associated Contestable Customer or Supplier within twenty-four (24) hours after detection or request.

7.4 RESOLUTION

7.4.1 Timeline

Upon receipt of the Meter Trouble Report, a Retail Metering Services Provider shall submit the correct metering data to the Central Registration Body within two (2) business days.

7.4.2 Unresolved Meter Trouble Reports

7.4.2.1 Estimation

If a Meter Trouble Report is still unresolved after the designated timeline in Section 7.4.1, the Central Registration Body shall implement the estimation and editing of metering data in accordance with Section SECTION 6 of this Manual.

7.4.2.2 Late Resolution
The Retail Metering Services Provider may still resolve a Meter Trouble Report and provide metering data acceptable to the Central Registration Body after the deadline set in Section 7.4.1. For late resolutions, the deadline to be reflected in the final settlement statement is five (5) business days prior to the issuance of the final settlement statement of the affected trading day.

7.4.2.2.1 Before Deadline

If the Retail Metering Services Provider resolves the Meter Trouble Report and submits metering data not later than five (5) business days prior to the issuance of the final settlement statement date of the affected trading day, the Central Registration Body shall use the submitted metering data for the final settlement of the Supplier or Contestable Customer.

7.4.2.2 After Deadline

If the Retail Metering Services Provider resolves the Meter Trouble Report and submits metering data later than five (5) business days prior to the issuance of the final settlement statement of the affected trading day, the Central Registration Body shall reflect the said adjustment in the succeeding billing period.²³

7.4.2.3 Certification

The Retail Metering Services Provider shall provide a certification on the adjusted metering data showing the agreement of all affected parties in accordance with Retail Rules Clause 4.6.2.3.

7.4.2.4 Meter Malfunction

In cases where there is an unintentional meter error (e.g., meter multiplier) that causes a meter malfunction, the Retail Metering Services Provider shall reconcile the metering data of the affected trading intervals within one (1) year after the date of discovery of such error.

²³ Retail Rules Clause 3.3.5.3(b)
SECTION 8 PERFORMANCE MANAGEMENT

8.1 COVERAGE

This section provides the Contestable Customers, Suppliers, Retail Metering Services Providers, and the Central Registration Body the steps for the review, evaluation and measurement of the performance of a Retail Metering Services Provider.

8.2 OBLIGATIONS

The Central Registration Body shall conduct periodic monitoring and reporting of the ratings of Retail Metering Services Providers using the measures in this section.

The Retail Metering Services Providers shall, if requested, provide the Central Registration Body information necessary for the measurement of their performance.

8.3 OVERVIEW

The Retail Metering Services Providers shall be measured with respect to the following areas:

a) The integrity of metering data provided by the Retail Metering Services Provider to the Central Registration Body and the Contestable Customers;

b) The timeliness of daily and monthly metering data delivery with respect to the deadlines in this Manual;

c) The timeliness in resolving the daily and monthly Meter Trouble Reports; and

d) Customer satisfaction.

8.4 PERFORMANCE MEASURES

The Central Registration Body shall rate the performance of Retail Metering Services Providers against the standards set forth in this section.

8.4.1 Service Delivery

8.4.1.1 Daily Meter Data Delivery

Daily Meter Data Delivery or Meter Retrieval Success is computed as the ratio of the number of metering installations with successfully communicated metering data to the total number of registered metering installations of the Retail Metering Services Providers.
8.4.1.2 Integrity of Metering Data

Integrity of Metering Data is computed as the ratio of the number of metering installations for which its metering data has passed the validation process to the total number of metering installation with successfully communicated metering data. Daily average of the Integrity of Metering Data shall be greater than or equal to 95%.

8.4.1.3 Timeliness and Percentage Resolution of Daily Meter Trouble Reports

Timeliness and Percentage Resolution of Daily Meter Trouble Reports is computed as the ratio of resolved Meter Trouble Reports, within two (2) business days, to the total number of metering installations for which a daily Meter Trouble Report was issued on. Average daily Timeliness and Percentage Resolution of Daily Meter Trouble Reports shall be greater than or equal to 90%.

8.4.1.4 Timeliness and Percentage Resolution of Monthly Meter Trouble Reports

Timeliness and Percentage Resolution of Monthly Meter Trouble Reports is computed as the ratio of resolved Meter Trouble Reports, not later than five (5) days prior to the issuance of the final settlement statement, to the total number of metering installations for which a monthly Meter Trouble Report was issued. Average daily Timeliness and Percentage Resolution of Monthly Meter Trouble Reports shall be greater than or equal to 90%.

8.4.1.5 Timeliness of Monthly Meter Data Delivery

Timeliness of Monthly Meter Data Delivery is computed as the ratio of the actual number of submitted metering data measured three (3) calendar days after the end of the billing period to the expected number of submitted metering data based on the number of metering installations of the Retail Metering Services Provider. Timeliness of Monthly Meter Data Delivery shall be 100% or complete delivery of metering data.

8.4.2 Customer Satisfaction

Customer Satisfaction shall be computed using inputs collected through a survey. The survey shall allow the customers of the Retail Metering Services Provider to rate their satisfaction with regard to the following areas:

a) Corporate Image,

b) Punctuality and Responsiveness,

c) Safety, and
d) Behavior and General Impression.

To facilitate the survey, a Retail Metering Services Provider Customer Satisfaction Rating (CSR) Sheet shall be issued the customers of the Retail Metering Services Provider. Annual average Customer Satisfaction shall be greater than or equal to 90%.

8.4.3 Summary

The performance measures described above are summarized in Table 5.

<table>
<thead>
<tr>
<th>Performance Category</th>
<th>Measure</th>
<th>Criteria</th>
<th>Percent Weight</th>
<th>Percent Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service Delivery</td>
<td>Daily Meter Data Delivery</td>
<td>Ratio of metering installations with successfully communicated metering data to total number of metering installations</td>
<td>25</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td>Integrity of Meter Data</td>
<td>Ratio of the number of metering installations with valid metering to the total number of metering installation with successfully communicated metering data</td>
<td>25</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td>Timeliness and Percentage Resolution to the Daily Meter Trouble Report</td>
<td>Ratio of resolved Meter Trouble Reports to the total number of metering installations for which a daily Meter Trouble Report was issued on</td>
<td>15</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>Timeliness and Percentage Resolution of Monthly Meter Trouble Reports</td>
<td>Ratio of resolved Meter Trouble Reports to the total number of metering installations for which a monthly Meter Trouble Report was issued on</td>
<td>10</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>Timeliness of Monthly Meter Data Delivery</td>
<td>Ratio of the actual number of submitted metering data to the expected number of submitted metering data based on the number of metering installations</td>
<td>15</td>
<td>100</td>
</tr>
<tr>
<td>Customer Satisfaction</td>
<td>Customer Satisfaction Rating</td>
<td>Retail Metering Service Provider Performance Appraisal by their</td>
<td>10</td>
<td>90</td>
</tr>
</tbody>
</table>
8.4.4 Computation of Overall Performance

The overall performance of the Retail Metering Services Provider shall be computed by summing the product of the rating of the Retail Metering Services Provider on each performance measure and the percent weight of the same performance measure as indicated in Table 5.

8.5 MONITORING PROCEDURES

The Central Registration Body shall calculate the performance measures and the overall performance score (Refer to Section 8.4 for details) of each Retail Metering Services Provider on a monthly, semi-annual and annual basis.

8.5.1 Monthly Performance Monitoring

After every billing period, the Central Registration Body shall release to concerned Contestable Customers, Suppliers and Retail Metering Service Providers the service delivery ratings (refer to Section 8.4.1) of their associated Retail Metering Service Provider. If requested, the Central Registration Body shall discuss the results of the performance monitoring with the concerned Contestable Customer, Supplier, or Retail Metering Service Provider. The results of the monthly performance monitoring shall be published in the market information web site²⁴.

8.5.2 Semi-Annual Customer Satisfaction Monitoring

Every six (6) months, the Central Registration Body shall determine the customer satisfaction rating of the Retail Metering Services Providers through the issuance of the Customer Satisfaction Rating Sheet to all direct Contestable Customers and Suppliers. The Central Registration Body shall require the direct Contestable Customers and Suppliers to accomplish and submit their issued Customer Satisfaction Rating Sheets back to the Central Registration Body.

The Customer Satisfaction Rating Sheets are to be accomplished every first week of July of the current year and January of the following year. The July rating shall determine the customer satisfaction performance of the Retail Metering Services Provider from January to June of the current year while the January rating shall determine the customer satisfaction performance of the Retail Metering Services Provider for the second half of the previous year (i.e., July to December).

8.5.3 Annual Performance Monitoring

The Annual Performance Monitoring of Retail Metering Services Providers covers the billing periods January to December of each year. It shall consist of:

²⁴ www.wesm.ph
a) The annual rating of the performance measures under Section 8.4.1 computed by averaging the ratings during the twelve (12) billing periods of the year, and

b) The Annual Customer Satisfaction Rating computed by averaging the ratings from the two (2) semi-annual surveys.

The Annual Performance of Retail Metering Services Providers shall be submitted by the Central Registration Body to the Philippine Electricity Market Corporation (PEMC) Management and published in the market information web site.
Table A-1. Meter Purpose Designations.

<table>
<thead>
<tr>
<th>Designation</th>
<th>Meter</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>Main Meter</td>
</tr>
<tr>
<td>R1</td>
<td>Alternate Meter (Partial Redundant Metering)</td>
</tr>
<tr>
<td>B</td>
<td>Alternate Meter (Full Redundant Metering)</td>
</tr>
<tr>
<td>B1</td>
<td>Backup Meter</td>
</tr>
</tbody>
</table>

Table A-2. Metering Equipment, Devices and Auxiliaries Designations.

<table>
<thead>
<tr>
<th>Designation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT</td>
<td>Current Transformer</td>
</tr>
<tr>
<td>LA</td>
<td>Lightning Arrester</td>
</tr>
<tr>
<td>MB</td>
<td>Meter Box</td>
</tr>
<tr>
<td>MD</td>
<td>Modem</td>
</tr>
<tr>
<td>MF</td>
<td>Multi-function Electronic Meter (Smart Meter)</td>
</tr>
<tr>
<td>PT</td>
<td>Potential Transformer</td>
</tr>
<tr>
<td>ST</td>
<td>Metering Structure</td>
</tr>
<tr>
<td>TS</td>
<td>Meter Test Switch</td>
</tr>
</tbody>
</table>
These guidelines shall be followed in the labeling and numbering of metering installations of a Contestable Customers.

1. The Metered Participant ID of Contestable Customers shall be identified by four (4) alpha-numeric characters except for cases cited in items 5 and 6 of these guidelines.

2. The Metered Participant ID of Contestable Customers whose full name corresponds to a three-letter abbreviation shall be that three-letter abbreviation appended by the zero (0) character.

   Example:

<table>
<thead>
<tr>
<th>Contestable Customer</th>
<th>Metered Participant ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Power Conversion</td>
<td>APC0</td>
</tr>
<tr>
<td>Bank of the Philippine Islands</td>
<td>BP10</td>
</tr>
<tr>
<td>Cultural Center of the Philippines</td>
<td>CCP0</td>
</tr>
</tbody>
</table>

3. The Metered Participant ID of Contestable Customers whose corporate name is composed of only one or two words shall be the first letter of the first word, the succeeding two (2) consonants of the first word, and the first letter of the second word or the zero (0) character.

   Example:

<table>
<thead>
<tr>
<th>Contestable Customer</th>
<th>Metered Participant ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amerton, Inc.</td>
<td>AMRI</td>
</tr>
<tr>
<td>Ayala Corp.</td>
<td>AYLC</td>
</tr>
<tr>
<td>Lancaster</td>
<td>LNC0</td>
</tr>
<tr>
<td>Magic Mall</td>
<td>MGCM</td>
</tr>
<tr>
<td>TIMEX</td>
<td>TMX0</td>
</tr>
</tbody>
</table>

4. The Metered Participant ID of Contestable Customers whose name consists of four (4) letters or less shall be its name itself appended by the zero (0) character, if necessary.

   Example:

<table>
<thead>
<tr>
<th>Contestable Customer</th>
<th>Metered Participant ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHPC</td>
<td>PHPC</td>
</tr>
</tbody>
</table>

5. The Metered Participant ID of Contestable Customers that have numeric characters in its corporate name shall be the numeric characters and the abbreviation of the alphabetic characters.
Example:

<table>
<thead>
<tr>
<th>Contestable Customer</th>
<th>Metered Participant ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>14-678 PROPERTY HOLDINGS INC.</td>
<td>146PH</td>
</tr>
<tr>
<td>1590 ENERGY CORPORATION</td>
<td>159EC</td>
</tr>
<tr>
<td>18-2 PROPERTY HOLDINGS INC.</td>
<td>182PH</td>
</tr>
<tr>
<td>19-1 REALTY CORPORATION</td>
<td>191RC</td>
</tr>
<tr>
<td>6-24 PROPERTY HOLDINGS INC.</td>
<td>624PH</td>
</tr>
<tr>
<td>6-3 PROPERTY HOLDINGS INC.</td>
<td>63PHI</td>
</tr>
<tr>
<td>21ST CENTURY STEEL MILLS, INC.</td>
<td>21CSM</td>
</tr>
</tbody>
</table>

6. The Metered Participant ID of Contestable Customers that have several facilities in their name shall be composed of six (6) alpha-numeric characters. The Metered Participant ID shall be the combination of three (3) alpha-numeric characters corresponding to the abbreviation of their corporate name, two (2) numeric characters corresponding to the facility number, and one (1) numeric character corresponding to the metering installation in that location.

Example:

<table>
<thead>
<tr>
<th>Contestable Customer</th>
<th>Metered Participant ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROBINSONS LAND CORP., Batangas</td>
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