

## Annex A

### Proposed Amendment on the WESM Manual on Metering Standards and Procedures regarding Current Transformer Requirements

WESM Manual on Metering Standards and Procedures Issue 11.0					Stakeholder Comments / Revisions	Stakeholder Rationale
Title	Clause	Provision	Proposed Amendment	Rationale		
Current Transformer Burden	2.5.7	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 (see Table 1)	<b><u>Shall be based on the standard rated burden as specified in the latest revision of IEC 61869-2 or ANSI/IEEE C57.13, or their latest equivalent standards.</u></b>	To consider the latest revision of International Standard IEC 61869-2 (2012) which cancels and replaces the first edition of IEC 60044-1 published in 1996 and to update the term “ANSI” to “IEEE”. Installation of a higher accuracy and functionality than the standards set by the PGC and WESM and its conformance to IEC and IEEE standards are supported by Sections 2.1.1 and 2.5.4.1 of WESM Metering Standards and Procedures which is also consistent with PEMC-TC’s opinion issued last April 2019 to Mactan Electric Corp. in which “the TC is of the opinion that the specifications of MECO’s current transformer comply with the metering accuracy class of 0.3 as well as the rated burden of B-1 (25VA), which is higher and therefore better than the burden B-0.2 (5VA) specified in PGC Appendix 2.” Refer to the attached letter (Annex “A”). Refer also to the attached Factory Test Reports (FAT) and MERALCO acceptance tests that		

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				<p>certifies that the CT maintains its accuracy within specified limits when tested at different primary current and burden. Factory Test Reports (FAT) also certifies that it conforms to IEC 61869-1, IEC 61869-2 and IEEE C57.13 Standard requirements.</p> <p>The rules change should also be reflected in the WESM Metering Standards and Procedures Issue 12.0, Appendix "N".</p>		
Requirements for Grid Revenue Meters	2.4.1.	[See pages 3-6]	[See pages 3-6]	Document Reference for consistency with the Philippine Grid Code 2016 Edition		
Requirements for Distribution Revenue Meter	2.4.2.	[See pages 6-8]	[See pages 6-8]	Document Reference for consistency with the Philippine Distribution Code 2016 Edition		
Current Transformer	2.5.7.	[See pages 8-9]	[See pages 8-10]	Document Reference for consistency with the Philippine Grid Code 2016 Edition		
Voltage Transformer	2.5.8.	[See pages 9-10]	[See pages 10-11]	Document Reference for consistency with the Philippine Grid Code 2016 Edition		

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Provision			Proposed Amendment																																																					
<p><b>2.4.1. Requirements for Grid Revenue Meters</b></p> <p>Meters installed as the main revenue meter, shall meet the minimum requirements listed below:</p> <table border="1"> <thead> <tr> <th>ITEMS</th> <th>SPECIFICATIONS</th> <th>REFERENCE DOCUMENTS</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>Grid Code 9.3.3.1</td> </tr> <tr> <td>No. of Stator</td> <td>Blondel's Theorem compliant / 3-element</td> <td></td> </tr> <tr> <td>Rating</td> <td>115V 1 A or 5 A 60 Hz</td> <td>The rating should be suitable to the secondary rating of the instrument transformers.</td> </tr> <tr> <td>No. of Quadrants (Measurement)</td> <td>Active Energy/Power Measurement: Bi-directional Reactive Power Measurement: 4 Quadrant</td> <td>Grid Code 9.3.3.2</td> </tr> <tr> <td>Interval Data</td> <td>Programmable to 1, 5, 15, 30, and 60 minute interval</td> <td>Grid Code 9.3.4.1</td> </tr> <tr> <td>No. of Channels</td> <td>At least eight (8)</td> <td>Grid Code 9.2.4.1 Grid Code 9.2.4.2</td> </tr> <tr> <td>Mass Memory</td> <td>Minimum 60 day recording of a 5-minute time-stamped demand interval for 8 recording channels</td> <td>WESM 4.5.1 (g) Grid Code 9.3.4.3 Grid Code 9.2.5.3</td> </tr> <tr> <td>Billing Function</td> <td>The meter shall be capable of measuring and recording the following electrical parameters per billing interval:                             <ul style="list-style-type: none"> <li>• Kwh (Delivered)</li> <li>• Kwh (Received)</li> <li>• Kvarh (Quadrant 1)</li> <li>• Kvarh (Quadrant 2)</li> </ul> </td> <td>Grid Code 9.2.4.1 Grid Code 9.2.4.2 Grid Code 9.3.3.1 Grid Code 9.3.3.2 Grid Code 9.5.4 Grid Code 9.5.5</td> </tr> </tbody> </table>			ITEMS	SPECIFICATIONS	REFERENCE DOCUMENTS	Accuracy Class	IEC 687 Class 0.2 / ANSI 12.20 Class 0.3 or better	Grid Code 9.3.3.1	No. of Stator	Blondel's Theorem compliant / 3-element		Rating	115V 1 A or 5 A 60 Hz	The rating should be suitable to the secondary rating of the instrument transformers.	No. of Quadrants (Measurement)	Active Energy/Power Measurement: Bi-directional Reactive Power Measurement: 4 Quadrant	Grid Code 9.3.3.2	Interval Data	Programmable to 1, 5, 15, 30, and 60 minute interval	Grid Code 9.3.4.1	No. of Channels	At least eight (8)	Grid Code 9.2.4.1 Grid Code 9.2.4.2	Mass Memory	Minimum 60 day recording of a 5-minute time-stamped demand interval for 8 recording channels	WESM 4.5.1 (g) Grid Code 9.3.4.3 Grid Code 9.2.5.3	Billing Function	The meter shall be capable of measuring and recording the following electrical parameters per billing interval: <ul style="list-style-type: none"> <li>• Kwh (Delivered)</li> <li>• Kwh (Received)</li> <li>• Kvarh (Quadrant 1)</li> <li>• Kvarh (Quadrant 2)</li> </ul>	Grid Code 9.2.4.1 Grid Code 9.2.4.2 Grid Code 9.3.3.1 Grid Code 9.3.3.2 Grid Code 9.5.4 Grid Code 9.5.5	<p><b>2.4.1. 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	<ul style="list-style-type: none"> <li>• Kvarh (Quadrant 3)</li> <li>• Kvarh (Quadrant 4)</li> <li>• Kvah (Delivered)</li> <li>• Kvah (Received)</li> <li>• Max Kw (Delivered)</li> <li>• Max Kw (Received)</li> <li>• Kvar (Quadrant 1)</li> <li>• Kvar (Quadrant 2)</li> <li>• Kvar (Quadrant 3)</li> <li>• Kvar (Quadrant 4)</li> <li>• Kva (Delivered)</li> <li>• Kva (Received)</li> <li>A. Power Factor</li> <li>• Frequency</li> <li>• Per Phase Current</li> <li>• Per Phase Voltage</li> </ul>			Billing Function	<p>The meter shall be capable of measuring and recording the following electrical parameters per billing interval:</p> <ul style="list-style-type: none"> <li>• Kwh (Delivered)</li> <li>• Kwh (Received)</li> <li>• Kvarh (Quadrant 1)</li> <li>• Kvarh (Quadrant 2)</li> <li>• Kvarh (Quadrant 3)</li> <li>• Kvarh (Quadrant 4)</li> <li>• Kvah (Delivered)</li> <li>• Kvah (Received)</li> <li>• Max Kw (Delivered)</li> <li>• Max Kw (Received)</li> <li>• Kvar (Quadrant 1)</li> <li>• Kvar (Quadrant 2)</li> <li>• Kvar (Quadrant 3)</li> <li>• Kvar (Quadrant 4)</li> <li>• Kva (Delivered)</li> <li>• Kva (Received)</li> <li>A. Power Factor</li> <li>• Frequency</li> <li>• Per Phase Current</li> <li>• Per Phase Voltage</li> </ul>	<p><del>Grid Code 9.2.4.1</del>  <del>Grid Code 9.2.4.2</del>  <del>Grid Code 9.3.3.1</del>  <del>Grid Code 9.3.3.2</del>  <del>Grid Code 9.5.4</del>  <del>Grid Code 9.5.5</del>  <b>PGC 2016 GRM 9.2.2.2</b>  <b>PGC 2016 GRM 9.2.3.3</b></p>
Loss Compensation	A flexible transformer loss compensation for both copper and iron losses and transmission/ distribution line loss compensation with a simple user set-up for Site Specific adjustments. Losses can be measured and segregated separately from other billing parameters.	Grid Code 9.2.3.1 WESM 4.5.2.2		Loss Compensation	A flexible transformer loss compensation for both copper and iron losses and transmission/ distribution line loss compensation with a simple user set-up for Site Specific adjustments. Losses can be measured and segregated separately from other billing parameters.	<p><del>Grid Code 9.2.3.1</del>  <b>WESM 4.5.2.2</b></p>
Security	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.	WESM 4.5.6 Grid Code 9.4.5		Security	The meter shall have provisions for securing the meter data, meter configurations and programs by	<p>WESM 4.5.6  <del>Grid Code 9.4.5</del>  <b>PGC 2016 GRM 9.3.8.1</b></p>
Communication Capability	The meter shall have at least minimum of three (3) independent communication ports that could operate independently. Each port can communicate	WESM 4.5.7.1 WESM 4.5.1( c ) Grid Code 9.3.4.2 Grid Code 9.5.1.1				

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	simultaneously, with each one using a different protocol. It should be capable of a two-way communication.	Grid Code 9.5.1.4		electronic means and/or passwords. It shall also be secured physically by way of security seals.	<b><u>PGC 2016 GRM 9.3.8.2</u></b> <b><u>PGC 2016 GRM 9.3.8.3</u></b>
Internal Clock	The meter shall have an internal clock with an allowable error of +/-1 second per demand interval.	WESM 4.5.8.1 Grid Code 9.3.4.4	Communication Capability	The meter shall have at least minimum of three (3) independent communication ports that could operate independently. Each port can communicate simultaneously, with each one using a different protocol. It should be capable of a two-way communication.	WESM 4.5.7.1 WESM 4.5.1( c ) <del>Grid Code 9.3.4.2</del> <del>Grid Code 9.5.1.1</del> <del>Grid Code 9.5.1.4</del> <b><u>PGC 2016 GRM 9.2.3.3</u></b>
Time Synchronization	Line frequency or crystal synchronization. The internal clock shall be capable of being reset set by the data collection software during normal collection operations.	WESM 4.5.8.1 Grid Code 9.3.4.4	Internal Clock	The meter shall have an internal clock with an allowable error of +/-1 second per demand interval.	WESM 4.5.8.1 <del>Grid Code 9.3.4.4</del> <b><u>PGC 2016 GRM 9.2.3.3</u></b>
Digital Display	The meter shall have a digital display with a minimum of 5 digits.	WESM 4.5.1 ( c ) Grid Code 9.3.3.1	Time Synchronization	Line frequency or crystal synchronization. The internal clock shall be capable of being reset set by the data collection software during normal collection operations.	WESM 4.5.8.1 <del>Grid Code 9.3.4.4</del> <b><u>PGC 2016 GRM 9.2.3.3</u></b>
Codes and Standards Compliance	The meter shall adhere to established International Standards (IEC, etc.).	Grid Code 9.3.3.1	Digital Display	The meter shall have a digital display with a minimum of 5 digits.	WESM 4.5.1 ( c ) <b><u>PGC 2016 GRM 9.2.3.3</u></b>
Applicable and Compliance Tests	These tests shall include material tests and established practice and/or other approved standards. Routine tests prescribed by the applicable standards shall be performed. In particular, the following tests shall be performed for the revenue meters: a. Power frequency tests (insulation) b. Impulse voltage test (insulation). c. HF interference test d. Surge withstand and fast transient tests	Grid Code 9.3.3.3. IEC 255-1 IEC 255-A (Class III) IEC 245-4	Codes and Standards Compliance	The meter shall adhere to established International Standards (IEC, etc.).	<del>Grid Code 9.3.3.1</del> <b><u>PGC 2016 GCR 4.2.10</u></b>
Battery	Capable of retaining readings and time of day for at least two days without external power source	Grid Code 9.2.5.3 Grid Code 9.3.3.2 WESM 4.5.1 (g)	Applicable and Compliance Tests	These tests shall include material tests and established practice and/or other approved standards. Routine tests prescribed by the applicable standards shall be performed. In particular, the following tests shall be performed for the revenue meters: a. Power frequency tests (insulation) b. Impulse voltage test (insulation). c. HF interference test	<b><u>PGC 2016 GRM 9.2.5.2</u></b> <b><u>PGC 2016 GRM 9.2.5.3</u></b> <b><u>PGC 2016 GRM 9.2.8.1</u></b> <del>Grid Code 9.3.3.3.</del> IEC 255-1 IEC 255-A (Class III) IEC 245-4

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Enclosure	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.	ANSI 12.1 4.3.4		d. Surge withstand and fast transient tests	
			Battery	Capable of retaining readings and time of day for at least two days without external power source	<b>PGC 2016 GRM 9.2.3.3</b> <del>Grid Code 9.2.5.3</del> <del>Grid Code 9.3.3.2</del> WESM 4.5.1 (g)
			Enclosure	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.	ANSI 12.1 4.3.4 <b>PGC 2016 GRM 9.2.2.3</b> <b>PGC 2016 GRM 9.2.2.4</b> <b>PGC 2016 GRM 9.3.8</b>

  

**2.4.2. Requirements for Distribution Revenue Meter**

Meters installed as the main revenue meter, shall meet the minimum requirements listed below:

ITEMS	SPECIFICATIONS	REFERENCE DOCUMENTS
Accuracy Class	IEC 687 Class 0.2 / ANSI 12.20 Class 0.3 or better	IEC 687 4.6
No. of Stator	Corresponds to the service type and complying with Blondell's Theorem	Dist. Code 8.4.3.1 ANSI C12.1
Voltage Rating	Corresponds to the secondary voltage rating of voltage transformers used	Dist. Code 5.5.1.1
Current Rating	Corresponds to the secondary current rating of current transformers used (typically 1A or 5A)	ANSI or IEC Standard
Frequency	60 Hz	Dist. Codes 3.2.2.1 -
Measurement	Bi-directional active metering (delivered & received) and 4-quadrant reactive metering	Dist Codes 8.3.3.1 Dist. Codes 8.3.4.2 Dist. Code 8.4.3.2
Interval Data	Programmable to 5, 15, 30 minute interval	Dist. Code 8.4.4.1
No. of Channels	At least Six (6) Channels	This satisfies the minimum requirements as stated under: Dist. Codes 8.3.3.2 Dist. Codes 8.3.4.3
Mass Memory	At least 60 days	Dist Code 8.3.5.3

**2.4.2 Requirements for Distribution Revenue Meter**

Meters installed as the main revenue meter, shall meet the minimum requirements listed below:

ITEMS	SPECIFICATIONS	REFERENCE DOCUMENTS
Accuracy Class	IEC 687 Class 0.2 / ANSI 12.20 Class 0.3 or better	IEC 687 4.6 <b>PDC 2016 7.2.7</b>
No. of Stator	Corresponds to the service type and complying with Blondell's Theorem	<b>PDC 2016 7.2.7</b> <del>Dist. Code 8.4.3.1</del> ANSI C12.1
Voltage Rating	Corresponds to the secondary voltage rating of voltage transformers used	<del>Dist. Code 5.5.1.1</del> <b>PDC 2016 7.2.7</b>
Current Rating	Corresponds to the secondary current rating of current transformers used (typically 1A or 5A)	ANSI or IEC Standard <b>PDC 2016 7.2.7</b>
Frequency	60 Hz	<del>Dist. Codes 3.2.2.1 -</del> <b>PDC 2016 7.2.7</b>

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Recording Billing Quantities	Display and record TOU energy and power parameters (kWh, kVarh, max. kW & cum. kW) for all rates	Dist. Code 8.4.3.1	Measurement	Bi-directional active metering (delivered & received) and 4-quadrant reactive metering	<del>Dist. Codes 8.3.3.1 Dist. Codes 8.3.4.2 Dist. Code 8.4.3.2</del> <b>PDC 2016 7.2.7</b>
Loss Compensation (if applicable)	A flexible transformer loss compensation for both copper and iron losses and transmission/ distribution line loss compensation with a simple user set-up for Site Specific adjustments. Losses can be measured and segregated separately from other billing parameters.	WESM 4.5.2.2	Interval Data	Programmable to 5, 15, 30 minute interval	<del>Dist. Code 8.4.4.1</del> <b>PDC 2016 7.2.7</b>
Security	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.	WESM 4.5.6	No. of Channels	At least Six (6) Channels	This satisfies the minimum requirements as stated under: <del>Dist. Codes 8.3.3.2 Dist. Codes 8.3.4.3</del> <b>PDC 2016 7.2.7</b>
Communication Capability	The meter shall be equipped with a means of communication channel capable of electronic data transfer. Either an integrated telephone modem, and/or RS-232 communication port for interface to an external communication medium are considered acceptable.	WESM 4.5.7.1 WESM 4.5.1( c ) Dist. Code 8.4.4.2	Mass Memory	At least 60 days	<del>Dist. Code 8.3.5.3</del> <b>PDC 2016 7.2.7</b>
Internal Clock/Battery	With long life lithium battery for clock/ calendar maintenance	WESM 4.5.8.1 Dist Code 8.4.4.6	Recording Billing Quantities	Display and record TOU energy and power parameters (kWh, kVarh, max. kW & cum. kW) for all rates	<del>Dist. Code 8.4.3.1</del> <b>PDC 2016 7.2.7</b>
Time Synchronization	The meter can be programmed to synchronize time without change in measured billing parameters.		Loss Compensation (if applicable)	A flexible transformer loss compensation for both copper and iron losses and transmission/ distribution line loss compensation with a simple user set-up for Site Specific adjustments. Losses can be measured and segregated separately from other billing parameters.	WESM 4.5.2.2
Digital Display	The meter shall have a digital display with a minimum of 5 digits.	WESM 4.5.1 ( c ) Dist Code 8.4.3.1	Security	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.	WESM 4.5.6 <b>PDC 2016 7.4.7</b>
			Communication Capability	The meter shall be equipped with a means of communication channel capable of electronic data transfer.	WESM 4.5.7.1 WESM 4.5.1( c ) <del>Dist. Code 8.4.4.2</del>

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Provision			Proposed Amendment		
Codes and Standards Compliance	The meter shall adhere to the IEC Standards or their equivalent national standards for metering			Either an integrated telephone modem, and/or RS-232 communication port for interface to an external communication medium are considered acceptable.	<b><u>PDC 2016 7.2.7</u></b>
Enclosure	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.	ANSI 12.1 4.3.4	Internal Clock/Battery	With long life lithium battery for clock/calendar maintenance	WESM 4.5.8.1 <del>Dist Code 8.4.4.6</del> PDC 2016 7.2.1
			Time Synchronization	The meter can be programmed to synchronize time without change in measured billing parameters.	
			Digital Display	The meter shall have a digital display with a minimum of 5 digits.	WESM 4.5.1 ( c ) <del>Dist Code 8.4.3.4</del> <b><u>PDC 2016 7.2.7</u></b>
			Codes and Standards Compliance	The meter shall adhere to the IEC Standards or their equivalent national standards for metering	IEC, ANSI/IEEE <b><u>PDC 2016 7.2.7</u></b>
			Enclosure	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.	ANSI 12.1 4.3.4

  

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**2.5.7. Current Transformer**

Current Transformer installed as the main metering, shall meet the minimum requirements listed below:

ITEMS	SPECIFICATIONS	REFERENCE DOCUMENTS
Type	Outdoor Type; Minimum oil filled, Dry Type or Gas-filled	
Cooling	Oil immersed, Self-cooled; Butyl, Cast resin	
Construction	Single phase, wound type, free standing	
Accuracy Class	IEC 44-1 Class 0.2 /ANSI C57.13 Class 0.3 or better	Grid Code 9.3.2.1
Burden	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 (see Table 1)	Grid Code 9.3.2.2 Grid Code 9.4.1.2
Rated Primary Current	The thermal rating factor shall not be less than 1.0.	
Secondary Current	1A or 5A	Grid Code 9.3.2.2

**xxx**

**2.5.7. Current Transformer**

Current Transformer installed as the main metering, shall meet the minimum requirements listed below:

ITEMS	SPECIFICATIONS	REFERENCE DOCUMENTS
Type	Outdoor Type; Minimum oil filled, Dry Type or Gas-filled	



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Provision			Proposed Amendment		
		IEC 4.2 Standard values of rated secondary currents	Cooling	Oil immersed, Self-cooled; Butyl, Cast resin	
Rating Factor	Minimum of 1.0 at 30°C		Construction	Single phase, wound type, free standing	
Frequency	60 Hz		Accuracy Class	IEC 44-1 Class 0.2 /ANSI C57.13 Class 0.3 or better	<del>Grid Code 9.3.2.1</del> <b>PGC 2016 GRM 9.2.3.2</b>
Ambient Air Temperature	-5°C and 50°C for very hot climate	IEC 3.2.1 1996	Burden	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 (see Table 1) <b>Shall be based on the standard rated burden as specified in the latest revision of IEC 61869-2 or ANSI/IEEE C57.13, or their latest equivalent standards.</b>	<del>Grid Code 9.3.2.2</del> <del>Grid Code 9.4.1.2</del> <b>PGC 2016 GRM 9.2.3.2</b>
BIL	Refer to Table 2 for applicable BIL		Rated Primary Current	The thermal rating factor shall not be less than 1.0.	
Creepage Distance	Refer to Table 3 for applicable creepage distance		Secondary Current	1A or 5A	<del>Grid Code 9.3.2.2</del> <b>PGC 2016 GRM 9.2.3.2</b> IEC 4.2 Standard values of rated secondary currents
Number of Core	Preferably Two (2) metering core	Grid Code 9321 Grid Code 9.3.2.2	Rating Factor	Minimum of 1.0 at 30°C	
Mounting	Depend on the applications		Frequency	60 Hz	
Grounding		Grid Code 9.3.2.2	Ambient Air Temperature	-5°C and 50°C for very hot climate	IEC 3.2.1 1996
Security	Seal holder shall be provided to the CT secondary terminal box (see Figure 1)	Grid Code 9.4.5 Meter Equipment Security	BIL	Refer to Table 2 for applicable BIL	
			Creepage Distance	Refer to Table 3 for applicable creepage distance	
			Number of Core	Preferably Two (2) metering core	<del>Grid Code 9321</del> <del>Grid Code 9.3.2.2</del> <b>PGC 2016 GRM 9.2.3.2</b>
			Mounting	Depend on the applications	

2.5.8. Voltage Transformer

Voltage Transformer installed as the main metering, shall meet the minimum requirements listed below:

ITEMS	SPECIFICATIONS	REFERENCE DOCUMENTS
Type	Outdoor Type; Minimum oil filled, Dry Type or Gas-filled	
Cooling	Oil immersed, Self-cooled; Butyl, Cast resin	
Construction	Single phase, Inductive type, single bushing	

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Provision			Proposed Amendment																										
Termination	Line-to-ground	Grid Code 9.3.1.	Grounding		<del>Grid Code 9.3.2.2</del> <b>PGC 2016 GCR 4.4.1.3.2</b> <b>PGC GRM 9.2.2.1 (g)</b>																								
Accuracy Class	IEC 6044-2 Class 0.2 /ANSI C57.13 Class 0.3 or better	Grid Code 9.3.1.1 .	Security	Seal holder shall be provided to the CT secondary terminal box (see Figure 1)	<del>Grid Code 9.4.5 Meter Equipment Security</del> <b>PGC 2016 GRM 9.3.8.2</b> <b>PGC 2016 GRM 9.2.4.1</b>																								
Burden	Shall not exceed the rated burden limit for the IEC 6044-2 Class 0.2 /ANSI C57.13 Class 0.3 or better. (see Table 4)	Grid Code 9.4.1.2	<b>2.5.8. Voltage Transformer</b>																										
Ratio	See Table 5		Voltage Transformer installed as the main metering, shall meet the minimum requirements listed below:																										
Secondary Voltage	See Table 5		<table border="1"> <thead> <tr> <th>ITEMS</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><del>Grid Code 9.3.1.</del> <b>PGC 2016 GRM 9.2.3.1</b> <b>PGC 2016 GCR 4.4.1.3</b></td> </tr> <tr> <td>Accuracy Class</td> <td>IEC 6044-2 Class 0.2 /ANSI C57.13 Class 0.3 or better</td> <td><del>Grid Code 9.3.1.1 .</del> <b>PGC 2016 GRM 9.2.3.1</b></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. (see Table 4) <b>Shall be compliant to the IEC 61869-3 or ANSI C57.13 Standard (or the latest version/s)</b></td> <td><del>Grid Code 9.4.1.2</del> <b>PGC 2016 GRM 9.2.3.1</b></td> </tr> <tr> <td>Ratio</td> <td>See Table 5</td> <td></td> </tr> </tbody> </table>			ITEMS	SPECIFICATIONS	REFERENCE DOCUMENTS	Type	Outdoor Type; Minimum oil filled, Dry Type or Gas-filled		Cooling	Oil immersed, Self-cooled; Butyl, Cast resin		Construction	Single phase, Inductive type, single bushing		Termination	Line-to-ground	<del>Grid Code 9.3.1.</del> <b>PGC 2016 GRM 9.2.3.1</b> <b>PGC 2016 GCR 4.4.1.3</b>	Accuracy Class	IEC 6044-2 Class 0.2 /ANSI C57.13 Class 0.3 or better	<del>Grid Code 9.3.1.1 .</del> <b>PGC 2016 GRM 9.2.3.1</b>	Burden	Shall not exceed the rated burden limit for the IEC 6044-2 Class 0.2 /ANSI C57.13 Class 0.3 or better. (see Table 4) <b>Shall be compliant to the IEC 61869-3 or ANSI C57.13 Standard (or the latest version/s)</b>	<del>Grid Code 9.4.1.2</del> <b>PGC 2016 GRM 9.2.3.1</b>	Ratio	See Table 5	
ITEMS	SPECIFICATIONS	REFERENCE DOCUMENTS																											
Type	Outdoor Type; Minimum oil filled, Dry Type or Gas-filled																												
Cooling	Oil immersed, Self-cooled; Butyl, Cast resin																												
Construction	Single phase, Inductive type, single bushing																												
Termination	Line-to-ground	<del>Grid Code 9.3.1.</del> <b>PGC 2016 GRM 9.2.3.1</b> <b>PGC 2016 GCR 4.4.1.3</b>																											
Accuracy Class	IEC 6044-2 Class 0.2 /ANSI C57.13 Class 0.3 or better	<del>Grid Code 9.3.1.1 .</del> <b>PGC 2016 GRM 9.2.3.1</b>																											
Burden	Shall not exceed the rated burden limit for the IEC 6044-2 Class 0.2 /ANSI C57.13 Class 0.3 or better. (see Table 4) <b>Shall be compliant to the IEC 61869-3 or ANSI C57.13 Standard (or the latest version/s)</b>	<del>Grid Code 9.4.1.2</del> <b>PGC 2016 GRM 9.2.3.1</b>																											
Ratio	See Table 5																												
Frequency	60 Hz																												
Operating Temperature	55°C average ambient temperature, with max ambient temperature not exceeding 65°C																												
BIL	Refer to Table 2 for applicable BIL																												
Creepage distance	Refer to Table 3 for applicable creepage distance																												
Number of Core	Preferably Two (2)																												
Mounting	Depend on the applications																												
Grounding		Grid Code 9.3.1.1																											
Security	Seal holder shall be provided to the CT secondary terminal box (see Figure 1)	Grid Code 9.4.5 Meter Equipment Security																											

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Provision	Proposed Amendment		
	Secondary Voltage	See Table 5	
	Frequency	60 Hz	
	Operating Temperature	55°C average ambient temperature, with max ambient temperature not exceeding 65°C	
	BIL	Refer to Table 2 for applicable BIL	
	Creepage distance	Refer to Table 3 for applicable creepage distance	
	Number of Core	Preferably Two (2)	
	Mounting	Depend on the applications	
	Grounding		<del>Grid Code 9.3.1.1</del> <b>PGC 2016 GCR 4.4.1.3.2</b> <b>PGC GRM 9.2.2.1 (g)</b>
	Security	Seal holder shall be provided to the CT secondary terminal box (see Figure 1)	<del>Grid Code 9.4.5 Meter Equipment Security</del> <b>PGC 2016 GRM 9.3.8.2</b> <b>PGC 2016 GRM 9.2.4.1</b>

