PROPOSED AMENDMENTS ON THE WESM RULES AND MANUALS (PROVISIONS ON MARKET OPERATOR'S METERING PROCESSES AND SITE SPECIFIC LOSS ADJUSTMENT)

Rules Change Committee | 20 November 2026

IEMOP
We Run Markets

BACKGROUND

- In its letter dated 25 March 2024, IEMOP informed the DOE on its observation on Appendix K of the WESM Metering Manual Issue 16 which provides the percent transformer loss indicated in the table below used to determine the total transformer losses:

Capacity (kVA)	Percent Transformer Loss (%)
1000	1.9
2000	1.8
3000	1.7
4000	1.6
5000	1.5
10000	1.4

For in-between capacities, interpolation shall be performed to calculate the Percent Transformer Loss

- As may be observed, the table adopted in Manual Issue 16 does not cover capacities less than 1,000 kVA and above 10,000 kVa.

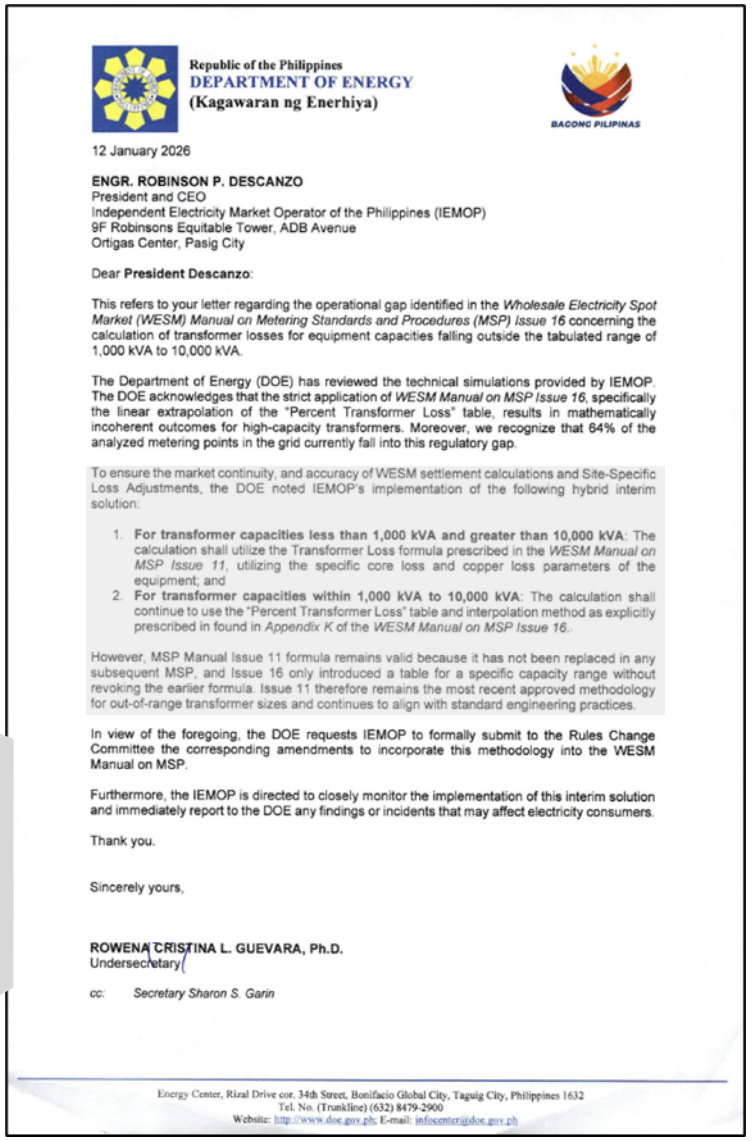
BACKGROUND

- In its letter dated 12 January 2026, the DOE provided guidance below:

To ensure the market continuity, and accuracy of WESM settlement calculations and Site-Specific Loss Adjustments, the DOE noted IEMOP's implementation of the following hybrid interim solution:

1. **For transformer capacities less than 1,000 kVA and greater than 10,000 kVA**: The calculation shall utilize the Transformer Loss formula prescribed in the *WESM Manual on MSP Issue 11*, utilizing the specific core loss and copper loss parameters of the equipment; and
2. **For transformer capacities within 1,000 kVA to 10,000 kVA**: The calculation shall continue to use the "Percent Transformer Loss" table and interpolation method as explicitly prescribed in found in *Appendix K* of the *WESM Manual on MSP Issue 16*.

However, MSP Manual Issue 11 formula remains valid because it has not been replaced in any subsequent MSP, and Issue 16 only introduced a table for a specific capacity range without revoking the earlier formula. Issue 11 therefore remains the most recent approved methodology for out-of-range transformer sizes and continues to align with standard engineering practices.



Republic of the Philippines
DEPARTMENT OF ENERGY
(Kagawaran ng Enerhiya)

BAGONG PILIPINAS

12 January 2026

ENGR. ROBINSON P. DESCANZO
President and CEO
Independent Electricity Market Operator of the Philippines (IEMOP)
9F Robinsons Equitable Tower, ADB Avenue
Ortigas Center, Pasig City

Dear **President Descanzo**:

This refers to your letter regarding the operational gap identified in the *Wholesale Electricity Spot Market (WESM) Manual on Metering Standards and Procedures (MSP) Issue 16* concerning the calculation of transformer losses for equipment capacities falling outside the tabulated range of 1,000 kVA to 10,000 kVA.

The Department of Energy (DOE) has reviewed the technical simulations provided by IEMOP. The DOE acknowledges that the strict application of *WESM Manual on MSP Issue 16*, specifically the linear extrapolation of the "Percent Transformer Loss" table, results in mathematically incoherent outcomes for high-capacity transformers. Moreover, we recognize that 64% of the analyzed metering points in the grid currently fall into this regulatory gap.

To ensure the market continuity, and accuracy of WESM settlement calculations and Site-Specific Loss Adjustments, the DOE noted IEMOP's implementation of the following hybrid interim solution:

1. **For transformer capacities less than 1,000 kVA and greater than 10,000 kVA**: The calculation shall utilize the Transformer Loss formula prescribed in the *WESM Manual on MSP Issue 11*, utilizing the specific core loss and copper loss parameters of the equipment; and
2. **For transformer capacities within 1,000 kVA to 10,000 kVA**: The calculation shall continue to use the "Percent Transformer Loss" table and interpolation method as explicitly prescribed in found in *Appendix K* of the *WESM Manual on MSP Issue 16*.

However, MSP Manual Issue 11 formula remains valid because it has not been replaced in any subsequent MSP, and Issue 16 only introduced a table for a specific capacity range without revoking the earlier formula. Issue 11 therefore remains the most recent approved methodology for out-of-range transformer sizes and continues to align with standard engineering practices.

In view of the foregoing, the DOE requests IEMOP to formally submit to the Rules Change Committee the corresponding amendments to incorporate this methodology into the WESM Manual on MSP.

Furthermore, the IEMOP is directed to closely monitor the implementation of this interim solution and immediately report to the DOE any findings or incidents that may affect electricity consumers.

Thank you.

Sincerely yours,

ROWENA CRISTINA L. GUEVARA, Ph.D.
Undersecretary

cc: Secretary Sharon S. Garin

Energy Center, Rizal Drive cor. 34th Street, Bonifacio Global City, Taguig City, Philippines 1632
Tel. No. (Trunkline) (632) 8479-2900
Website: http://www.doe.gov.ph; E-mail: infocenter@doe.gov.ph

BACKGROUND

- The DOE further confirmed that the WESM Metering Manual 11 formula remains valid because it has not been replaced in any subsequent manual, and Issue 16 only introduced a table for a specific capacity range without revoking the earlier formula. Thus, Issue 11 therefore remains the most recent approved methodology for out-of-range transformer sizes and continues to align with standard engineering practices.

- The DOE requested IEMOP to formally submit to the Rules Change Committee the corresponding amendments to incorporate this methodology into the WESM Metering Manual.

- Upon review of the WESM Rules and Metering manual, the IEMOP observed certain metering provisions that needs to be updated to align with existing practices of the industry.

RATIONALE OF THE PROPOSAL

- To comply with the DOE's directive to submit to the Rules Change Committee the corresponding amendments to incorporate the methodology for the determination of the SSLA for out-of-range transformer sizes to the WESM Metering Manual.

- To institutionalize and adopt in the WESM Rules and Market Manuals the metering practices observed in the WESM.

SUMMARY OF THE PROPOSAL

Amendments to Appendix K – Site-Specific Loss Adjustment

1. Providing the separate formula for active and reactive line.
2. Providing the definition of each variables for the determination of calculation of line losses.
3. Providing the formula for the determination of out-of-range Transformer kVA Ratings.
4. Harmonization of terminologies.

SUMMARY OF THE PROPOSAL

WESM Metering Manual Issue 16	Proposed Amendment
$$kW_{Meter} = \frac{kWh_{Meter}}{t}$$	$$kW_{Meter} = \frac{kWh_{Meter}}{t}$$
$$kVAR_{Meter} = \frac{kVARh_{Meter}}{t}$$	$$kVAR_{Meter} = \frac{kVARh_{Meter}}{t}$$
$$pf = \frac{kW_{Meter}}{\sqrt{(kW_{Meter})^2 + (kVAR_{Meter})^2}}$$	$$pf = \frac{kW_{Meter}}{\sqrt{(kW_{Meter})^2 + (kVAR_{Meter})^2}}$$
$$I_{Line} = \frac{kW_{Meter}}{\sqrt{3} \times V_{Rated} \times pf}$$	$$I_{Line} = \frac{kW_{Meter}}{\sqrt{3} \times V_{Rated} \times pf}$$
$$Line_{kW-Loss} = \frac{(I_{Line})^2 \times R_T}{1000}$$	$$\boldsymbol{Active\ Line_{kW-Loss} = \frac{(I_{Line})^2 \times R_T}{1000}}$$
	$$\boldsymbol{Reactive\ Line_{kVAR-Loss} = \frac{(I_{Line})^2 \times X_T}{1000}}$$

SUMMARY OF THE PROPOSAL

WESM Metering Manual Issue 16	Proposed Amendment
	Where: t = duration of a dispatch interval, in hours R_T = Total resistance of the line conductor per line, in ohms X_T = Total Reactance of the Line Conductor per line, in ohms pf = Power Factor kWh_{Meter} = Active energy derived from the meter registration, in kWh $kVARh_{Meter}$ = Reactive energy derived from the meter registration, in kVARh kW_{Meter} = Demand (Active Power) derived from the meter registration, in kW $kVAR_{Meter}$ = Reactive Power derived from the meter registration, in kVAR I_{Line} = Current along the line, in Ampere V_{Rated} = Rated voltage of the line, in kV Active $Line_{kW-Loss}$ = the active loss along the line, in kW Reactive $Line_{kVAR-Loss}$ = the reactive loss along the line, in kVAR

SUMMARY OF THE PROPOSAL

WESM Metering Manual Issue 16

ii. Calculation of Transformer Losses:

For the calculation of the transformer losses, the following percent transformer loss (% Transformer Loss) shall be used to determine the total transformer losses.

Capacity (kVA)	Percent Transformer Loss (%)
1,000	1.9
2,000	1.8
3,000	1.7
4,000	1.6
5,000	1.5
10,000	1.4

For in between capacities, interpolation shall be performed to calculate the Percent Transformer Loss.

When translating power (and energy) metered at the secondary side to the primary side, the following formula shall be used:

$$kW_{P-Meter} = \frac{kW_{Meter}}{(1 - \frac{\%Transformer_{Loss}}{100})}$$

$$kVAR_{P-Meter} = \frac{kVAR_{Meter}}{(1 - \frac{\%Transformer_{Loss}}{100})}$$

$$Transformer_{kW-Loss} = kW_{P-Meter} - kW_{Meter}$$

Conversely, power (and energy) that is metered at the primary side shall be translated to the secondary side using the formula:

$$kW_{S-Meter} = kW_{Meter}(1 - \frac{\%Transformer_{Loss}}{100})$$

$$kVAR_{S-Meter} = kVAR_{Meter}(1 - \frac{\%Transformer_{Loss}}{100})$$

$$Transformer_{kW-Loss} = kW_{Meter} - kW_{S-Meter}$$

Proposed Amendment

ii. Calculation of Transformer Losses:

a. For the calculation of the transformer losses, the following percent transformer loss (% Transformer Loss) shall be used to determine the total transformer losses.

Capacity (kVA)	Percent Transformer Loss (%)
1,000	1.9
2,000	1.8
3,000	1.7
4,000	1.6
5,000	1.5
10,000	1.4

For in between capacities, interpolation shall be performed to calculate the Percent Transformer Loss.

When translating power (and energy) metered at the secondary side to the primary side, the following formula shall be used:

$$kW_{P-Meter} = \frac{kW_{Meter}}{(1 - \frac{\%Transformer_{Loss}}{100})}$$

$$kVAR_{P-Meter} = \frac{kVAR_{Meter}}{(1 - \frac{\%Transformer_{Loss}}{100})}$$

$$Transformer_{kW-Loss} = kW_{P-Meter} - kW_{Meter}$$

Conversely, power (and energy) that is metered at the primary side shall be translated to the secondary side using the formula:

$$kW_{S-Meter} = kW_{Meter}(1 - \frac{\%Transformer_{Loss}}{100})$$

$$kVAR_{S-Meter} = kVAR_{Meter}(1 - \frac{\%Transformer_{Loss}}{100})$$

$$Transformer_{kW-Loss} = kW_{Meter} - kW_{S-Meter}$$

SUMMARY OF THE PROPOSAL

WESM Metering Manual Issue 16	Proposed Amendment
	b. For kVA ratings below or above the kVA capacity ratings in the table, the following formula shall be utilized for the calculation of the transformer loss of the meter: **Core Loss = $T_{Core\ Loss}$** **Copper Loss = $\left(\frac{\left(\frac{kW_{Meter}}{pf}\right)}{\text{kVA Rating}}\right)^2 \times P_{Short\ Circuit}$** **Transformer $Loss_{kW\text{-}Loss}$ = Core Loss + Copper Loss** **Where:** **$T_{Core\ Loss}$ = Rated Core Loss of the Transformer** **kW_{Meter} = Demand (Active Power) derived from the meter registration, in kW** **pf = Power Factor** **kVA Rating = Apparent power of the Transformer, in kVA** **$P_{Short\ Circuit}$ = Rated Copper Loss of the Transformer**

SUMMARY OF THE PROPOSAL

WESM Rules and Metering Manual

1. Harmonization of terminologies.
2. Harmonization of references to other documents or government issuances.
3. Clarifying the activities of the Market Operator in terms of meter access and data provision and retrieval
4. Clarifying the roles of the Market Operator and Governance Arm in developing process and imposition of penalties and sanctions for metering service providers.
5. Clarifying the role of the metering service providers in case of changes in connection of their customers.
6. To update references under the provisions across the rules and manuals.

IEMOP

We Run Markets

WWW.IEMOP.PH | INFO@IEMOP.PH | @IEMOPINFO

