



Republic of the Philippines  
**DEPARTMENT OF ENERGY**

**DEPARTMENT CIRCULAR NO. \_\_\_\_\_**

**ADOPTING FURTHER AMENDMENTS TO THE MARKET MANUAL ON  
PROCEDURES FOR THE MONITORING OF FORECAST ACCURACY  
STANDARDS FOR MUST DISPATCH GENERATING UNITS**

**WHEREAS**, Sections 30 and 37(f) of the Electric Power Industry Reform Act (EPIRA) provides that the DOE, jointly with the electric power industry participants, shall establish the Wholesale Electricity Spot Market (WESM) and formulate the detailed rules governing the operations thereof;

**WHEREAS**, on 28 June 2002, the DOE, with the endorsement of the electric power industry participants, promulgated the WESM Rules through Department Circular No. DC2002-06-003;

**WHEREAS**, on 20 March 2017, the DOE promulgated the amended various WESM Market Manuals for the implementation of Must Dispatch and Priority Dispatch Generating Units in the WESM through Department Circular No. DC2017-03-0002;

**WHEREAS**, any changes, amendments, and modifications to the WESM Rules, Retail Rules and their Market Manuals shall be undertaken in accordance with the provisions of Chapter 8 of the WESM Rules;

**WHEREAS**, on 11 April 2019, the Philippine Electricity Market Corporation (PEMC) submitted to the Rules Change Committee (RCC) its proposed amendments to the Market Manual on Procedures for the Monitoring of Forecast Accuracy Standards for Must Dispatch Generating Units;

**WHEREAS**, the proposal aims to mainly align the provisions of the abovementioned Market Manual with the forthcoming operation of the new Market Management System and to provide a more appropriate calculation for the forecast percentage error;

**WHEREAS**, on 12 April 2019, during the 151<sup>st</sup> RCC Meeting, PEMC presented the proposed amendments to the RCC for approval for publication in the PEMC website;

**WHEREAS**, following the presentation and request, the RCC approved the publication of the proposed amendments in the PEMC website to solicit comments from WESM stakeholders, giving them until 30 May 2019 or thirty (30) working days from the date of publication (15 April 2019) to submit comments on the matter;

**WHEREAS**, the DOE, the Technical Committee (TC), the Independent Electricity Market Operator of the Philippines (IEMOP), the National Grid Corporation of the Philippines (NGCP), San Carlos Sun Power, Inc. (SACASUN), Wind Energy

Developers Association of the Philippines (WEDAP), SPC Power Corporation (SPC) and Aboitiz Power Corporation (APC) submitted comments to the proposal;

**WHEREAS**, 21 June 2019, the RCC during its 153<sup>rd</sup> RCC Meeting deliberated on the proposal giving due consideration to the submitted comments and the corresponding responses of the proponent;

**WHEREAS**, the RCC finalized the proposed amendments of the PEMC, and thereafter approved for endorsement to the PEM Board on 21 June 2019;

**WHEREAS**, on 31 July 2019 (14<sup>th</sup> Regular PEM Board Meeting), the PEM Board, after due evaluation and deliberation, approved the above stated RCC-approved proposal for endorsement to the DOE;

**WHEREAS**, on \_\_ November 2019, the DOE conducted various public consultation on the said proposed amendments to ensure transparency and consistency with the objectives of the EPIRA and the WESM;

**WHEREAS**, the DOE reviewed the said PEM Board-approved proposal and the comments and recommendations from the public consultation, made further revisions on the proposed amendments for consistency with the objectives of the WESM such as transparency and efficiency;

**NOW THEREFORE**, pursuant to its authority under the EPIRA and the WESM Rules, the DOE hereby adopts, issues, and promulgates the following amendments to the Market Manual:

**Section 1. Amendments to the WESM Manual on the Procedures for the Monitoring of Forecast Accuracy Standards for Must Dispatch Generating Units Issue 1.0.** The following provisions in the WESM Manual on the Procedures for the Monitoring of Forecast Accuracy Standards for Must Dispatch Generating Units Issue 1.0 are hereby amended:

- (a) Section 1.1 (Background) and its Subsections under Introduction is amended to read as –

**“1.1 BACKGROUND**

1.1.1 The *WESM Rules* require *generation companies* to submit to the *Market Operator projected outputs* in respect of their *must dispatch generating units* for each *dispatch interval*.

xxx      xxx                  xxx

1.1.4 Moreover, the *Enforcement and Compliance Office (ECO)* of the *Philippine Electricity Market Corporation (PEMC)* is required by the *WESM Rules* to report to the *PEM Board* and *DOE* the annual compliance of each *must dispatch generating unit* to the forecast accuracy standards with respect to its *projected outputs*.”

(b) Section 2.1.2 (Glossary) under Definitions is amended to read as:

“2.1.2 Glossary

- (a) Forecast percentage error. Error (in %) of the *projected output* submitted by a *must dispatch generating unit* with respect to its *projected output* over a *dispatch interval* in accordance with Section 4.2.3
- (b) Initial loading. Loading (in MW) for the beginning of the *dispatch interval* assumed in, or estimated by, the *dispatch optimization* performed prior to the beginning of that *dispatch interval*.
- (c) MAPE. Abbreviation of *mean absolute percentage error*.
- (d) Mean absolute percentage error. Mean of the *forecast percentage errors* of a *must dispatch generating unit* over a certain period calculated in accordance with Section 4.2.1.
- (e) Must dispatch generating unit. A *generating unit* so designated by the *Market Operator* under clause 2.3.1.5 of the *WESM Rules* and is provided *Must Dispatch*. For brevity and when the context applies, this also refers to a *generation company* that operates a *must dispatch generating unit* in this *Market Manual*.
- (f) Perc95. Abbreviation of *percentile 95 of the forecasting error*.
- (g) Percentile 95 of the forecasting error. The value (in %) not exceeding 95% of the forecast percentage errors of the *must dispatch generating unit* during a certain period (see Section 6, Appendix A of this Manual).
- (h) Projected quantity. Estimated *generation* of a *must dispatch generating unit* over a *trading interval* based on its submitted *projected output* assuming linear ramping calculated in accordance with Section 4.2.4.
- (i) Transition Period. The period specified by the DOE wherein the provisions under Section 4.5 shall apply.”

(c) Section 3.1 (Market Operator) and its Subsections under Responsibilities is amended to read as:

“3.1 PEMC

3.1.1 *PEMC* shall review annually the forecast accuracy standards in this *Market Manual*.

3.1.2 The ECO shall report to the *PEM Board* and the *DOE* the monthly and annual compliance of each *must dispatch generating unit* to the forecast accuracy standards with respect to its *projected outputs*.”

(d) Section 3.4.2 under Generation Companies is amended to read as:

“3.4.2 *Generation companies* shall immediately advise the *System Operator* and *Market Operator* of any circumstances which threaten a significant probability of material adverse change in the state of their facilities in any dispatch interval of any trading day in the current week-ahead market horizon. After the occurrence of the significant event referred to above, the Generation Company shall submit a written report to the *Market Operator* with supporting data immediately within the following trading day.”

(e) New Section 3.5 under Responsibilities is added to read as:

“3.5 *Market Operator*

3.5.1 The *Market Operator* shall advise the *must dispatch generating units* of their *real-time dispatch schedules*, and any output restrictions imposed as a result of the dispatch scheduling process or by the *System Operator*.”

(f) Section 4.1 (Standards) and its Subsections under Forecast Accuracy Standards and Procedures is amended to read as:

“4.1 Standards

4.1.1 Each *must dispatch generating unit* shall comply with the following standards with respect to its *mean absolute percentage error (MAPE)* and *percentile 95 of the forecasting error (Perc95)* determined in accordance with Section 4.2 and calculated over the period specified in Section 4.1.2:

Technology	Standards	
	MAPE	Perc95
Solar	< 18%	< 30%
Wind		
Run of River Hydro	< 9%	< 30%

4.1.2 The *MAPE* and *Perc95* of each *must dispatch generating unit* shall be calculated over the period starting on the 26th of December of a year and ending on the 25th of December of the succeeding year.

4.1.3 Subject to Section 4.5 of this *Market Manual*, *must dispatch generating units* who fail to meet the requisite forecast accuracy standards set out in Section 4.1.1 of this *Market Manual* may be liable for sanctions imposed under Clause 7.2 of the *WESM Rules*. For this purpose, the ECO shall develop the necessary procedures and guidelines for monitoring the compliance with the forecast accuracy standards including the procedure for the review by the Market Surveillance Committee of the results of the

monitoring, and the approval and imposition of appropriate penalty by the *PEM Board*.”

- (g) Section 4.2 (Calculations) and its Subsections under Forecast Accuracy Standards and Procedures is amended to read as:

“4.2 Calculations

xxx      xxx              xxx

- 4.2.3 The *forecast percentage error* for a *trading interval* of a *must dispatch generating unit* shall be calculated using the following formula:

$$FPE_{i,t} = \left| \frac{PQ_{i,t} - MQ_{i,t}}{PQ_{i,t}} \right| \times 100\%$$

Where,

$FPE_{i,t}$  *forecast percentage error* (in %) of *must dispatch generating unit i* for *trading interval t*

$PQ_{i,t}$  *projected quantity* (in MWh) of *must dispatch generating unit i* for *trading interval t* calculated in accordance with Section 4.2.4

$MQ_{i,t}$  *metered quantity* (in MWh) of *must dispatch generating unit i* for *trading interval t* as provided by the *Metering Services Provider*

- 4.2.4 The *projected quantity* for each *dispatch interval* of a *must dispatch generating unit* shall be calculated using the following formula:

$$PQ_{i,t} = \frac{1}{n} \sum_{1}^n \frac{IL_{i,t} + PO_{i,t}}{2}$$

Where,

$PQ_{i,t}$  *projected quantity* (in MWh) of *must dispatch generating unit* for *trading interval t*

$IL_{i,t}$  *initial loading* (in MW) of *must dispatch generating unit i* for each *dispatch interval* used during the scheduling process for *trading interval t*

$PO_{i,t}$  *projected output* (in MW) of *must dispatch generating unit i* for each *dispatch interval* used during the scheduling process for *trading interval t*

$n$  number of *dispatch interval(s)* within a *trading interval*

4.2.5 A one hundred (100) percent FPE shall be imposed to a *must dispatch generating unit* on a particular *dispatch interval* where its *Projected Quantity* is equal to zero (0) and a metered quantity has been recorded in its metering data.”

(h) Section 4.3 (Exclusions) under Forecast Accuracy Standards and Procedures is amended to read as:

“4.3.1 *Forecast percentage errors* occurring on the following conditions shall be excluded from the calculation of the *MAPE* and *Perc95* of *must dispatch generating units*:

- a) the *dispatch target* of the *must dispatch generating unit* was restricted below its *projected output*<sup>12</sup>;
- b) the output of the *must dispatch generating unit* was restricted by the *System Operator*<sup>13</sup> as indicated in the *System Operator’s* report submitted to the *Market Operator* in accordance with the *WESM Rules*<sup>14</sup>;
- c) a *market suspension* or *market intervention* was declared for the *dispatch interval*;
- d) an *outage* resulted in its derating; or
- e) a natural calamity (e.g., typhoon, landslide) affected the ability of the *must dispatch generating unit* to forecast accurately.
- f) the projected quantity and the metered quantity both reflect zero (0) MWh.

footnote 13 – *Clause 3.8.3.5, WESM Rules*

(i) Section 4.4 (Monitoring, Reporting and Review) and its Subsections under Forecast Accuracy Standards and Procedures is amended to read as:

“4.4.1 The *ECO* shall report to the *PEM Board* and *DOE* the annual compliance of each *must dispatch generating unit* to the forecast accuracy standards with respect to its *projected outputs* within two (2) calendar months after the end of the period specified in Section 4.1.2.

4.4.2 The *ECO* shall report to the *PEM Board* and *DOE* the status of the compliance of each *must dispatch generating unit* to the *forecast accuracy standards* as of the most recent *Billing Period* with a *final statement* on a monthly basis.

4.4.3 *PEMC* shall periodically review the forecast accuracy standards set in Section 4.1.”

(j) Section 4.5 (Transition Period) under Forecast Accuracy Standards and Procedures is amended to read as:

“4.5 Transition Period

4.5.1 A *transition period* covering the period specified by the DOE shall be implemented for amendments related to compliance of *must dispatch generation unit*.

xxx      xxx                  xxx

4.5.3 Before the end of the *transition period*, PEMC shall submit to the DOE and other concerned government agencies a report on the compliance of *must dispatch generating units* to the forecast accuracy standards and its proposed forecast accuracy standards to be implemented after the *transition period*.

xxx      xxx                  xxx”

(k) Section 5.2 (Publication) under Amendment, Publication and Effectivity is amended to read as:

“5.2 Publication

5.2.1 This *Market Manual*, as it may be amended from time to time, shall be published by PEMC.”

(l) Appendix A (NIST Method for Calculating Percentiles) is amended to read as:

“Appendix A NIST Method for Calculating Percentiles

xxx      xxx                  xxx

Sample list:  $Y_{[k]} = \{5\%, 12\%, 3\%, 20\%, 15\%\}$ ;  $N = 5$

Sample ordered data:  $Y_{[k]} = \{3\%, 5\%, 12\%, 15\%, 20\%\}$ ;  $N = 5$

xxx      xxx                  xxx”

**Section 2. Separability Clause.** If for any reason, any section or provision of this Circular is declared unconstitutional or invalid, such parts not affected shall remain valid and subsisting.

**Section 3. Effectivity.** This Circular shall take effect 15 days following its complete publication in at least two (2) newspapers of general circulation. Copies thereof shall be filed with the University of the Philippines Law Center – Office of National Administrative Register (UPLC-ONAR).

Issued this \_\_\_\_ November 2019 at the DOE, Energy Center, Rizal Drive, Bonifacio Global City, Taguig City, Metro Manila.

**ALFONSO G. CUSI**  
Secretary