

TC-ANREP-2016

# Technical Committee 2016 Annual Report

January 2016 to December 2016

This Report is prepared by the Philippine Electricity Market Corporation – Market Assessment Group for the Technical Committee.

February 2017

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The Technical Committee (TC) submits this Annual Report covering the activities undertaken and accomplished by the TC for the year 2016. This report also presents the proposed activities of the TC for the year 2017.

The Market Assessment Group (MAG) provides support to the TC in performing its functions and obligations under the WESM Rules and applicable WESM Manuals.

## **I. 2016 ACCOMPLISHMENTS**

### **A. Conduct of Technical Studies or Reviews**

#### **A.1. Study on Dispatch Tolerance Limit**

Following the transmittal of its report on the study on the dispatch tolerance limit to the Market Surveillance Committee (MSC), and the presentation of the same to the Philippine Electricity Market Corporation (PEMC) and the Department of Energy (DOE) in December 2015<sup>1</sup>, the TC finalized and approved the public version of the report on the study on the dispatch tolerance limit, and had the same published in the market information website on 04 March 2016.

Said study was undertaken in response to the MSC's request for the TC to review the reasonability of the  $\pm 3\%$  dispatch tolerance limit as provided under the PEM Board Resolution No. 2005-15. Said request was in connection with the monitoring of the MSC on the possible non-compliances by trading participants to the RTD schedule.

In its report, the TC concluded that there was no indication that the current  $\pm 3\%$  dispatch tolerance limit needed to be revised. The TC however recommended that further investigation be conducted if the deviation in MW exceeded the frequency bias (in MW/0.1 Hz) for each grid as declared by the System Operator. The report stated that the balance

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<sup>1</sup> The TC completed its study on the dispatch tolerance limit and transmitted its report on the study to the Market Surveillance Committee, copy furnished to Pres. Melinda L. Ocampo, on 30 September 2015. The same was presented to PEMC and DOE on 26 November 2015, to discuss the said study. (Ref. [TC-ANREP-2015](#))

between supply and demand, including losses, is the basis for maintaining the system frequency. As such, the TC was of the opinion that analyzing dispatch accuracy should be done together with demand forecast accuracy.

Also, as with the TC's previous recommendation in 2011, the TC recommended a shorter trading interval from the current one-hour trading interval to minimize both end-of-interval dispatch deviations and intra-interval variations, etc. Since energy units are traded in the market, a shorter trading interval would result to more accurate technical and commercial transactions.

#### **A.2. Study on the Pmin of Combined Cycle Gas Turbine Plants<sup>2</sup>**

During the 1<sup>st</sup> and 2<sup>nd</sup> quarters of 2016, the TC prioritized the completion of its study on the minimum stable load (Pmin) of combined cycle gas turbine (CCGT) plants. Said study was initiated by the TC as a supplemental activity, following the submission of its comments on the study conducted by PEMC-Trading Operations Department (TOD) on the Pmin issue of the 1200 MW Ilijan CCGT plant ("Ilijan").

In its study, the TC recommended that the Pmin of CCGT plants be based on the basic combined cycle configuration, i.e. a module configuration composed of one (1) gas turbine and one (1) steam turbine (1 GT + 1 ST)<sup>3</sup>.

The TC finalized and approved its report on the study on the Pmin of CCGT plants and submitted the same to the Philippine Electricity Market (PEM) Board, copy furnished PEMC Pres. Melinda L. Ocampo, on 07 April 2016. The public version of the report was published in the market information website on 06 May 2016.

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<sup>2</sup> Carried-over activity from 2015 TC Work Plan

<sup>3</sup> Ref: [TC Study on Pmin of CCGT](#)

### **A.3. Study on the Framework of Participation of Battery Energy Storage Systems in the Market<sup>4</sup>**

The TC continued its discussion on the study on the framework of the participation of battery energy storage (BES) systems in the market. Said study was initiated by the TC, emanating from a request from the Rules Change Committee (RCC) to determine the classification of BES systems in the WESM.

As reference in its study, the TC reviewed the initiatives on the integration of BES systems in other jurisdictions. The TC also gathered relevant documents on BES as additional reference materials, such as the copy of the approved *Test Procedure on Battery Energy Storage System*, which the System Operator prepared and presented to the Grid Management Committee (GMC), and the copy of PEMC-TOD's evaluation on BES systems. As requested by the TC, resource persons from PEMC-TOD presented their evaluation on BES.

The TC thereafter consolidated all relevant inputs based on available documents and discussions on BES during its meetings and subsequently discussed its recommendations. The TC included recommendations on the registration, participation, mode of operation and modelling of BES systems.

Based on the result of its review and discussions, the TC opined that BES is beneficial to the market, and thus acknowledged that BES can be used as fast responding regulating reserve. However, the TC noted that the capacity of BES as reserve is a function of its state of charge which has to be continuously monitored by the System Operator for timely reserve dispatch, and by the Market Operator in the eventual market-based reserve scheduling.

In its report, the TC also emphasized that the new market management system (MMS) should be able to accommodate the peculiar behavior of BES, such as its bidirectional power injection to the grid and periodic monitoring of the state of charge. The TC further recognized that even as it introduces additional computing and communication burden to

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<sup>4</sup> Carried-over activity from 2015 TC Work Plan

the MMS, the shorter dispatch interval provides a better environment for storage technologies such as BES to participate in the market.

In view of the above, the TC thus recommended that: (a) BES be classified as Non-Generator Resource (NGR) emphasizing its distinct characteristics compared to rotating machine-based generators; (b) a grid impact study be conducted based on the size of the BES facility; and (c) relevant market rules be revised accordingly, establishing the requirement for the classification of BES as NGR and requirement for registration and offer submission<sup>5</sup>.

The TC finalized and approved its report on the study on the framework of participation of BES systems in the market and submitted the same to the PEM Board, copy furnished PEMC Pres. Melinda L. Ocampo, on 20 January 2017. The public version of the report was published in the market information website on 23 January 2017.

#### **A.4. Study on Participation of Embedded Generation in the Market**

The TC commenced its discussion on the study on the participation of embedded generation (EG) in the market, which study was requested by the DOE for inclusion in the TC activities, during the drafting of the TC 2016 Work Plan.

In the course of its initial discussions, the TC was informed that upon the request of the DOE, PEMC has previously submitted a discussion paper on the issues related to the participation of EGs in the WESM. As reference in its ongoing study, the TC requested the following documents:

- a. *Issue Paper on Embedded Generation in the WESM*, prepared and submitted to the DOE by PEMC-Corporate Planning and Communications (CPC); and
- b. proposed Department Circular on *Construction and Operation of Embedded Generating Facilities*, drafted by the National Grid Corporation of the Philippines (NGCP).

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<sup>5</sup> Ref: [TC Study on the Framework of Participation of BES Systems in the Market](#)

As part of its consultation process, the TC requested resource persons from PEMC-CPC to present its issue paper. Noting the substantial content of the issues paper, the TC put on hold its ongoing study and decided to provide comments on PEMC-CPC's issue paper instead. In addition to its comments, the TC also included other issues not covered in PEMC-CPC's issue paper. The TC document containing its comments on the PEMC's issues paper and other issues is being finalized and the same is expected to be submitted to the DOE within the 1<sup>st</sup> quarter of 2017.

#### **A.5. Study on the Operation of the Reserve Market and the Integration of Variable Renewable Energy Resources**

The TC commenced its study on the operation of the Reserve Market and the integration of VRE resources. Initial discussions were with regard to the level of reserve in consideration of the VRE and power resiliency. The TC also checked updates on the status of the GMC's proposed amendments on the categories of reserves and gathered relevant documents as reference in drafting the outline of its report.

On 16 June 2016, the TC conducted a consultation meeting with the PEMC-TOD to solicit information and discuss matters in relation to the study. The TC also reviewed the report prepared by SW Advisory<sup>6</sup>, on the pricing and cost recovery mechanism for reserves in the WESM, noting that some of the issues discussed by the TC may have been covered already in the SW Advisory report.

Noting the information gathered during the consultation meeting and from relevant documents, the TC focused its succeeding discussions on the following topics:

- a. stages of Reserve Market implementation which include, among others, the co-optimization of energy and reserve, the current reserve categories and the reserve categories during the interim and the full implementation of Reserve Market;

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<sup>6</sup> The SW Advisory is the independent consultant who conducted the technical study on the operational and regulatory framework for the implementation of the Reserve Market.

- b. harmonization of the proposed reserve categories for the Reserve Market with the reserve categories in the Philippine Grid Code 2016 edition.

In the course of its study, the TC noted that the output of the study on BES systems (Section **A.3**) would be a significant input to the study on the operation of the Reserve Market and the integration of VRE resource. To prioritize the completion of the studies on BES systems and EGs in the WESM (Sections **A.3** and **A.4**), the TC agreed to carry-over its ongoing study on the operation of Reserve Market and integration of VRE resources, in its 2017 activities.

#### **A.6. Study on the Planned Forecasting Methodology in the New Market Management System**

The TC commenced its discussion on the study on the planned forecasting methodology in the new MMS. As reference for its study, the TC reviewed relevant documents and Manuals as regards the forecasting methodology in the WESM. The TC also invited resource persons from the PEMC-TOD for a presentation and discussion on the load forecasting methodology in the new MMS.

In the course of its study, the TC was assured that the issues on load forecasting in the current MMS would be addressed in the new MMS. With the imminent implementation of the new MMS, the TC thereafter deferred the conduct of the study on the planned forecasting methodology.



**B. Conduct of Trainings, Seminars and/or Consultation Meetings****B.1. Meeting for the Presentation of Transmission Development Plan 2016**

In its effort to keep itself updated on matters that concern the electric power industry, the TC requested representatives from the System Operator to present and discuss the NGCP's Transmission Development Plan 2016 – 2025 on 09 June 2016. Cognizant that such information will also provide helpful inputs to the WESM Governance Committees in the performance of their respective mandates, the TC likewise invited the members of the other WESM Governance Committees, i.e. Rules Change Committee, Market Surveillance Committee, PEM Audit Committee, and Dispute Resolution Administrator, and representatives from PEMC's Market Assessment Group and Legal Department to attend the presentation.

**B.2. Seminar on Power System**

Upon the request of the Market Assessment Group, the TC conducted a seminar on Power System 101 (Introduction to Power Systems for Non-Engineers) on 26 September 2016, to broaden the basic knowledge of the non-engineer independent members of the WESM Governance Committees, as well as PEMC employees on matters relating to electricity. Said seminar aimed to enhance the knowledge of the participants on technical matters, particularly on the power system, deemed useful in the performance of their respective tasks.

## **C. Review of TC Business Procedures**

### **C.1. Review of the TC Internal Rules**

As part of its responsibility, the TC reviewed its Internal Rules Issue 2.0 with the objective of enhancing its business procedures. After due deliberation, the TC agreed to revise the provisions pertaining to the conduct of business and decision-making. The TC thereafter promulgated the revised TC Internal Rules (Issue 3.0) effective 07 April 2016.

Noting that the affected provisions were based on the Guidelines Governing the Constitution of the PEM Board Committees Issue 2.0, the TC also subsequently reviewed the said Guidelines with the view to submit proposed amendments as may be appropriate (See discussions in **Section C.2.**).

### **C.2. Review of the Guidelines Governing the Constitution of the PEM Board Committees**

In the course of its review of the TC Internal Rules, the TC noted that some provisions in the said rules, particularly with regard to the conduct of business and decision-making, are not applicable for the TC. Since the said provisions were lifted from the Guidelines Governing the Constitution of the PEM Board Committees Issue 2.0, the TC decided to also submit its proposed amendments on the same, recommending the manner of decision-making of the TC be based on consensus instead of majority vote.

Following its review of the Guidelines, the TC finalized its proposed amendments and subsequently transmitted the same to the RCC on 26 April 2016. Said proposal was thereafter approved and endorsed to the PEM Board by the RCC. In its meeting on 29 November 2016, the PEM Board agreed to retain the majority rule in the decision-making process of the TC as currently provided under the Guidelines instead of consensus, noting that decisions on non-technical issues may be difficult to arrive at through a consensus among members.

## **D. Review of Proposed Amendments to the WESM Rules and Manuals**

### **D.1. Proposed Amendments to the WESM Rules for the Implementation of Enhancements to Market Design and Operations**

Following the RCC's invitation to all WESM members and interested parties to submit comments on the proposed amendments of PEMC to the WESM Rules for the implementation of enhancements to market design and operations, the TC reviewed the proposal and deliberated and finalized its comments and thereafter submitted the same to the RCC on 21 January 2016.

Said proposal for amendments was in accordance with the policies as provided for under the DOE Circular No. DC2015-010-0015<sup>7</sup> and covered the enhancements in WESM design and operations, as follows:

- a. Shortening of trading and dispatch interval from one (1) hour to five (5) minutes;
- b. Ex-ante pricing only for energy and reserves for every 5-minute dispatch interval;
- c. One (1) hour settlement interval for settlement purposes based on weighted average of the 5-minute ex-ante prices;
- d. Automatic pricing corrections;
- e. Implementation of hourly day-ahead projections (DAP) with sensitivities and hour-ahead projections (HAP);
- f. Implementation of nodal-based short-term demand forecasting; and
- g. Automatic dispatch conformance monitoring for energy and reserves.

In its letter to the RCC, the TC suggested that the provisions on computations, such as 3.13.4 *Zonal Reserve Settlement Quantity*, Sec. 3.13.13 *Determining the Transmission Rights Trading Amount*, Sec. 3.13.14 *Settlement Amounts for Trading Participants*, among others, be changed into equations for clarity. The TC also noted that some terminologies defined in the glossary such as *load weighted average*, among others, could be simplified by including an equation in the definition. On the other hand, some

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<sup>7</sup> Department Circular No. DC2015-010-0015 *Providing Policies for Further Enhancement of the Wholesale Electricity Spot Market (WESM) Design and Operations*

terminologies such as *sending node*, *receiving node*, among others, could be simplified further by including diagrams.

## **D.2. Proposed Amendments to the WESM Manuals on Price Determination Methodology, Constraint Violation Coefficient and Pricing Re-Runs**

The TC reviewed the PEMC's proposed amendments to the WESM Manuals on Price Determination Methodology (PDM), Constraint Violation Coefficient (CVC) and Pricing Re-Runs. The proposed amendments to the said manuals were in support of the related proposals to the WESM rules submitted by PEMC for the implementation of enhancements to the WESM design and operations.

The proposed amendments to the PDM consolidated the various price-related provisions of several other affected manuals, thus having the effect of abolishing the following Manuals:

- a. Procedure for Determining Ex-Post Nodal Energy Prices (EPNEP), Issue 2;
- b. Methodology for Determining Pricing Errors and Price Substitution Due to Congestion for Energy Transactions in the WESM (PSM), Issue 4;
- c. Administered Price Determination Methodology (APDM), Issue 5;
- d. Segregation of Line Rental Trading Amounts (SLRTA), Issue 1;
- e. Management Net Settlement Surplus, Issue 2; and
- f. Management of Must-run and Must-stop Units (MRU Manual), Issue 6.

On the other hand, the proposed amendments to the CVC Manual aimed to introduce enhancements on the same. The said amendments integrated the mechanism of pricing re-runs into the CVC Manual which had the effect of abolishing the WESM Manual on the Criteria for the Issuance of Pricing Error Notices and Conduct of Market Re-Run (PEN\_MRR).

In general, the TC recommended that the mathematical equations in the WESM Manual on Price Determination Methodology be simplified and the format be made consistent,

and to replace the word “delta” with the symbol “ $\Delta$ ” in Table 2 of Section 5.3 *Automatic Pricing Re-Run Parameters* in the WESM Manual on Constraint Violation Coefficients (CVC) and Pricing Re-Runs.

The TC finalized its comments on the proposed amendments and transmitted the same to the RCC on 15 July 2016.

### **D.3. Review of Proposed Amendments to the WESM Manual on Dispatch Protocol Issue 11.0**

The TC reviewed the RCC's proposed amendments to the WESM Manual on Dispatch Protocol Issue 11.0 regarding dispatch tolerance standards and co-generation facilities. The TC reviewed the proposed amendments and, in particular, simplified and clarified the definition of maximum available capacity and defined the technical constraints of plants, in general, to specify those of hydro, geothermal and co-generation plants. Some technical constraints enumerated in the definition were proposed to be deleted considering that said constraints were not technical constraints and can be addressed with proper maintenance. The TC finalized its comments to the proposed amendments and transmitted the same to the RCC on 16 May 2016.

### **D.4. Review of Proposed Amendments to the WESM Manual on Metering Standards and Procedures**

Following the RCC's request for comments on the proposed amendments to the WESM Manual on Metering Standards and Procedure, the TC reviewed the PEMC's proposed amendments to the WESM Manual on Metering Standards and Procedures Issue 10.0 regarding Metering Service Provider (MSP) Performance Measures. The TC discussed the proposed amendments and consolidated its comments on the same and thereafter finalized its comments to the proposed amendments and transmitted the same to the RCC on 16 May 2016.

Further, the TC reviewed the RCC's proposal which was published for comments on 03 June 2016. Said proposal was a consolidation of the previous proposals on the WESM Manual on Metering Standards and Procedures Issue 9.0, which were submitted by PEMC and the TC in 2014.

Consistent with the TC's previous comments on the proposed amendments to the WESM Rules, WESM Manual and Retail Manual on Metering Standards and Procedures, the TC reiterated that the requirement for the installation of backup meters should only be optional.

The TC noted that if however, backup meters were installed, it should be clarified: (a) which entity, i.e. customer or Metering Services Provider (MSP), would request for the installation; (b) who would shoulder the cost of installation; and (c) whether the current transformer (CT) and potential transformer (PT) for main and backup meters were separate. In addition, the TC deemed that the specifications of the backup meter should be the same as that of the main meter.

On the matter of the costs for the meters installed, the TC opined that the entity that requested for the installation of the backup meter should be the one to shoulder the costs attendant to the installation of the same.

The TC finalized its comments to the proposed amendments and subsequently transmitted the same to the RCC on 15 July 2016.

**D.5. Review of the Proposed Amendments to the WESM Manuals for the Implementation of Preferential Dispatch, FIT-All Collection and Non-expiration of Standing Submissions in the WESM**

The TC reviewed and discussed the proposed amendments to the WESM Manuals<sup>8</sup> for the implementation of preferential dispatch, FIT-All collection and non-expiration of standing submission in the WESM.

The TC posed no objection to the proposed amendments to the affected Manuals, except for the proposed new WESM Manual on Forecast Accuracy Standards for Must Dispatch Generating Units Issue 1.0. The TC deemed that the one (1) year period within which to assess the compliance of Must Dispatch Generating Units to said standards is too long. The TC suggested that the review of the mean absolute percentage error (MAPE) and percentile 95 of the forecasting error (Perc95), be conducted more often than annual so that any non-compliances may be addressed by generators as soon as they are informed of their inability to comply with said standards.

The TC finalized its comments to the proposed amendments and transmitted the same to the RCC on 26 April 2016.

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<sup>8</sup>*Billing and Settlement Manual Issue 4.0; Dispatch Protocol Manual Issue 11.0; Guidelines on Significant Variations in and between Trading Intervals Issue 2.0; Load Forecasting Methodology Issue 2.0; Management Procedure on Excess Generation Issue 2.0; Market Operator Information Disclosure and Confidentiality Manual Issue 3.0; Metering Standards and Procedures Issue 10.0; Procedure for Determining Ex-Post Nodal Energy Prices Issue 2.0; Registration, Suspension and De-registration Criteria and Procedures Issue 1.0; WESM Manual on Forecast Accuracy Standards for Must Dispatch Generating Units Issue 1.0*

**E. Support to PEM Audit Committee****E.1. PAC-TC Joint Conduct of the 2<sup>nd</sup> Metering Arrangements Review<sup>9</sup>**

As part of the Technical Working Group (TWG) created for the conduct of the 2<sup>nd</sup> Metering Arrangements Review (“Metering Review”), the TC, represented by Prof. Jordan Rel C. Orillaza and Engr. Jaime V. Mendoza, continued to provide assistance to the PEM Audit Committee (PAC) in the completion of the said Review<sup>10</sup>.

The TC joined the PAC during its regular meetings and the harmonization TWG meetings held during the period. The TC also continuously assisted the PAC in the finalization of the report on the 2<sup>nd</sup> Metering Review. The TC was provided with the copies of the final report on 04 April 2016.

**E.2. Joint 6<sup>th</sup> Market Operations Audit and 3<sup>rd</sup> Review of Metering Installations and Arrangements**

Pursuant to its mandate in the WESM Rules, the TC continued to provide assistance to the PAC in the conduct of the joint 6<sup>th</sup> Market Operational (MO) Audit and 3<sup>rd</sup> Review of Metering Installations and Arrangements (RMIA). Following the PAC’s request, the TC reviewed the Terms of Reference (TOR) for the joint MO Audit and RMIA. In its review of the TOR, the TC deemed that the review by External Auditors of the appropriateness of preventive maintenance measures by MSPs should be based on hard coded rules. As such, the TC proposed to state in the TOR that the adequacy and conformance of MSPs should be assessed against applicable rules and standards.

The TC finalized its proposed revisions and submitted the same to the PAC, through the PAC Secretariat on 11 January 2016.

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<sup>9</sup> Carried-over activity from 2015 Work Plan

<sup>10</sup> Department Circular No. DC2014-01-0001 *Creating A Technical Working Group to Assist the Philippine Electricity Market Auditor Under the Philippine Electricity Market Corporation in the Conduct of 2<sup>nd</sup> Metering Arrangements Review*



**F. Other Activities****F.1. Invitation for Meetings from External Parties**

During the period, the TC received invitations for meeting from external parties to solicit inputs or opinions from the TC on specific concerns.

**F.1.1. GN Power's Request for a Meeting Regarding Bataan System Integrity Protection Scheme**

On 11 August 2016, the TC received a letter from GN Power requesting for meeting to discuss and at the same time consult regarding the Bataan System Integrity Protection Scheme (SIPS), which was to be implemented by the System Operator. The TC discussed the request and carefully considered the situation of GN Power.

On 06 September 2016, the TC transmitted its response letter addressed to GN Power relaying the TC's action on the request for a meeting. In its letter, the TC informed GN Power that it recognized that the System Operator's proposed Bataan SIPS had been presented to the GMC earlier in 2016 and was still pending consideration with the GMC. The TC, thus, deemed it prudent to abstain from discussing the matter with GN Power as a courtesy to the ongoing process before the GMC.

**F.1.2. Distribution Management Committee's Invitation to Attend the Distribution Operations Subcommittee Meeting**

On 22 November 2016, the TC received a letter from the Distribution Management Committee (DMC) inviting representatives from the TC to attend the DMC's Distribution Operations Subcommittee Meeting. Said meeting was convened to discuss the request of the Private Electric Power Operators Association (PEPOA) for the DMC to formulate a recommendation to ERC on the proper treatment of transformer losses and site specific loss adjustment (SSLA).

Engr. Jaime V. Mendoza, in behalf of the TC, together with representatives from PEMC, participated in the subcommittee meeting held on 02 December 2016.

## **F.2. Participation in Market Participants' Update**

The TC participated as resource speaker during the Market Participants' Update (MPU) held on 29 April 2016 in Batangas City. During the MPU, Prof. Jordan Rel C. Orillaza presented the WESM Governance Updates for Q4 2015 to Q1 2016, in behalf of the WESM Governance Committees.

Activities in Sections **A.5** and **E2** were included as carried-over activities for 2017 since discussion and deliberations on the said topics are still ongoing. **Section II** provides the details of the TC 2017 Work Plan which contains said carried-over activities<sup>11</sup> as well as new activities for the 2017, as follows:

## II. 2017 WORK PLAN

Item	Activity	Requested by	Period Covered <sup>12</sup>	Responsible Lead Person/s	Status	Remarks/Deliverables
1.	Review of TC 2016 Annual Report	TC	Q1	TC	(new)	Submit TC 2016 Annual Report to PEM Board
2.	Comments to PEMC-CPC's Issues Paper on Embedded Generation	DOE	Q1	Engr. Jaime V. Mendoza	Carried-over activity	Submit comments on PEMC-CPC's issues paper to DOE
3.	Study on Operation of Reserve Market and Integration of VRE Resources	TC	Q1 – Q2	Engr. Fidel D. Dagsaan, Jr.	Carried-over activity	Submit report to PEM Board (cc: PMLO)
4.	Proposed Amendments to the	TC	Q1 – Q2	Prof. Jordan Rel C. Orillaza	(new)	Submit proposed amendments to the RCC

<sup>11</sup> Items 1 and 7 in the 2017 Work Plan are carried-over activities from the 2016 Work Plan, while item 2 is the action item for the Study on the Participation of Embedded Generation in the Market (Section A.4).

<sup>12</sup> "Period Covered" refers to the commencement and completion of each activity

Item	Activity	Requested by	Period Covered <sup>12</sup>	Responsible Lead Person/s	Status	Remarks/Deliverables
	WESM Rules (Battery Energy Storage)					
5.	Joint 6 <sup>th</sup> MO Audit and 3 <sup>rd</sup> Review of Metering Installations and Arrangements (RMIA)	PAC	Q1 – Q2	Engr. Jaime V. Mendoza/ Prof. Jordan Rel C. Orillaza	(new)	Assist PAC/ Participate in Meetings Conducted for the Joint 6 <sup>th</sup> MO Audit and 3 <sup>rd</sup> RMIA
6.	Review of TC Internal Rules	TC	Q2	TC	(new)	Submit proposed amendments to the TC Internal Rules
7.	Comments to Various Proposed Amendments	RCC	Q1 – Q4	TC	(continuing)	Submit comments or proposed amendments to RCC
8.	Participation in Market Participants' Update, Open House, etc.	PEMC-CPC	(CPC timeline)	TC	(recurring)	Participate as resource speaker, if required
9.	Conduct of Training/Seminar	TC or any requesting party	Q3	TC	(new)	Conduct of training or seminar
10.	Conduct of New Study/ies	TC or any requesting party	Q2 – Q4	TC	(new)	Submit report to PEM Board and/or requesting party.
11.	Others <i>(as may be directed by DOE or PEM Board and as may be requested by PEMC and by other Governance Committees)</i>	DOE/ PEM Board or any requesting party		TC	(continuing)	

### **III. MEMBERSHIP**

For 2016, the members of the Technical Committee (“TC”) were as follows:

1. Prof. Jordan Rel C. Orillaza (Independent)
2. Engr. William C. Alcantara (Independent)
3. Engr. Jaime V. Mendoza (DMC representative)
4. Engr. Fidel D. Dagsaan, Jr. (SO representative)

Prof. Jordan Rel C. Orillaza was appointed as independent member of the TC on 01 July 2013 and was designated as chairperson on 28 April 2015.

Engr. William C. Alcantara was appointed as independent member of the TC on 01 August 2013. He was the lead person for the Study on the Framework of Participation of BES Systems in the WESM until the expiration of his appointment on 31 July 2016. Prof. Jordan Rel C. Orillaza subsequently took over the position as lead person until the completion of the said study. No independent member has been appointed yet since the expiry of the appointment of Engr. Alcantara.

The SO representative, Engr. Fidel D. Dagsaan, Jr., was appointed on 28 April 2015. Engr. Jaime V. Mendoza was appointed as DMC representative on 24 June 2010 and has been on hold-over status since the expiry of his three-year appointment as DMC representative to the TC.

No GMC representative has been appointed as TC member since the expiry of appointment of the previous GMC representative on 31 July 2014.

#### **IV. RESPONSIBILITIES**

The main role and responsibilities of the TC are set out in the WESM Rules as follows:

1. Monitor technical matters relating to the operation of the spot market,
2. Provide a report to the PEM Board on any matter of a technical nature relating to any WESM member which in the reasonable opinion of the Technical Committee, causes:
  - a. That WESM Participant to be unable to comply with the WESM Rules; or
  - b. Unintended or distortionary effects to the operation of the WESM;
3. Assist the PEM Board by providing expertise in relation to:
  - a. Information technology;
  - b. Metering technology and metering data; and
  - c. Any other matter of a technical nature relating to the spot market;
4. From time to time if the Technical Committee in its discretion deems necessary or appropriate, propose amendments to the WESM Rules in relation to technical matters, in accordance with chapter 8 with a view to:
  - a. Improving the efficiency and the effectiveness of the operation of the spot market; and
  - b. Improving or enhancing the prospects for the achievement of the WESM objectives; and
5. Assist the Rules Change Committee in relation to its assessment of proposals of a technical nature to amend the WESM Rules under chapter 8.

In addition, the TC is also tasked to conduct technical reviews and studies pursuant to the guidelines set forth in the TC Market Manual.

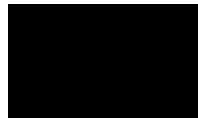
The TC conducted thirteen (13) meetings<sup>13</sup> in 2016. The TC deliberated on a number of matters during its meetings in line with its responsibilities as provided in the WESM Rules.

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<sup>13</sup> At any time and as may be practicable, the TC may conduct meetings more than once a month

**Submitted By:**

**Technical Committee**



**Jordan Reyes C. Orillaza**  
Chairperson



**Fidel D. Dagsaan, Jr.**  
Member



Member