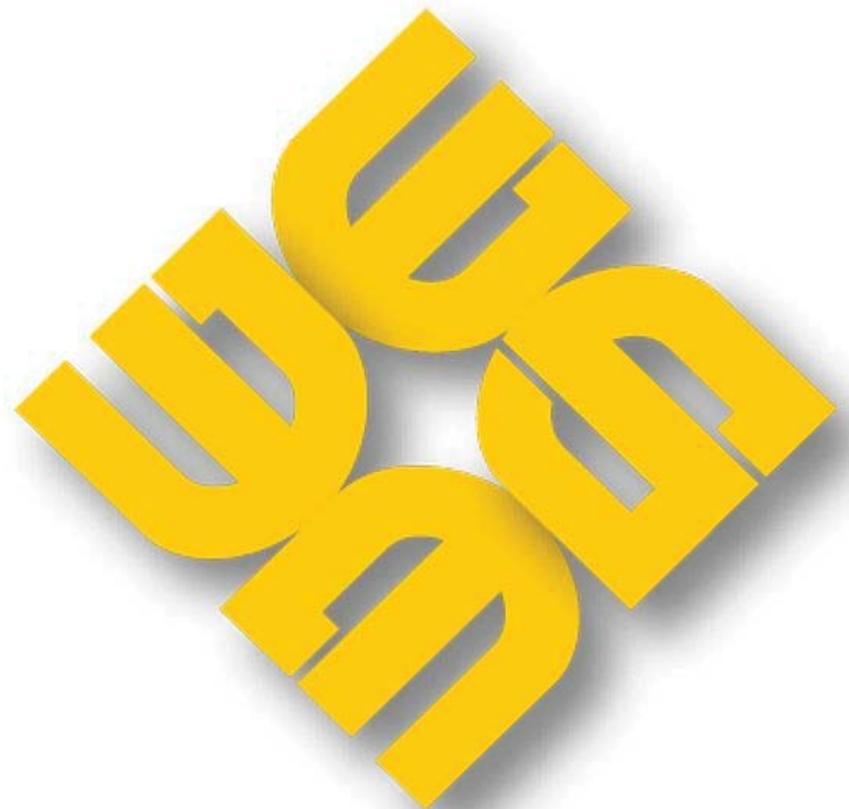


PUBLIC

Market Operator Performance

Annual Report for the Period
26 September 2015 to 25 September 2016
MOPS-2016-AR.1



**PHILIPPINE ELECTRICITY MARKET
CORPORATION
MARKET ASSESSMENT GROUP
(MAG)**

Executive Summary

This 2016 Annual Market Operator Performance Report provides the results of the monitoring and assessment of the Market Operator's performance for the period 26 September 2015 to 25 September 2016 (4Q 2015 – 3Q 2016).

In accordance with Clause 1.3.2.3 of the WESM Rules and Clause 1.4.2 of the Retail Rules, the current version of the Market Operator Performance Standards (MOPS) was approved by the PEM Board on 22 January 2015 and by the DOE on 06 October 2015.

The monitoring of the MO's performance is also provided under the Integrated Management System (IMS), as one of the Measurement, Analysis and Improvement Processes under the Quality Management System (QMS) of the Philippine Electricity Market Corporation (PEMC).

The over-all performance of the MO in 2016 is Satisfactory. The MO's performance rating in each performance category in 2016 and 2015 is provided below.

Category	Measure	Weight (%)	Target	2015		2016			Y-O-Y (Score)
				Actual	Score	Actual	Score		
A. IT Systems									
Market Management Systems	Availability	15	99.80%	99.88%	4	99.85%	3	Satisfactory	↓
WESM Website	Availability	5	99.50%	99.85%	5	99.87%	5	Excellent	■
B. Market Reports and Data Publication									
	Availability	5	95%	99.97%	4	99.99%	4	Very Satisfactory	■
	Timeliness	10	95%	96.77%	4	>95%	4	Very Satisfactory	■
C. Forecast Accuracy									
RTD Forecast - MAPE	Accuracy (L)	3.75	0.95%	0.79%	4	0.80%	4	Very Satisfactory	■
	Accuracy (V)	3.75	1.20%	1.16%	4	1.50%	2	Needs Improvement	↓
RTD Forecast - FAR	Accuracy (L)	3.75	97.20%	98.78%	5	98.64%	5	Excellent	↑
	Accuracy (V)	3.75	93.00%	95.03%	4	89.70%	2	Needs Improvement	↓
DAP Forecast - MAPE	Accuracy (L)	2.5	1.60%	1.39%	4	1.36%	4	Very Satisfactory	■
	Accuracy (V)	2.5	2.20%	2.18%	4	2.00%	4	Very Satisfactory	■
D. Dispatch Scheduling and Pricing									
RTD Workflow	Successful Run	2.5	99.75%	100%	5	100%	5	Excellent	■
RTX Workflow	Successful Run	2.5	99.75%	99.91%	4	100%	5	Excellent	↑
Pricing Errors and Market Re-runs	Timeliness (Prelim)	2	98.50%	99.98%	5	99.17%	4	Very Satisfactory	↓
	Timeliness (Final)	3	99.50%	100%	5	100%	5	Excellent	■
Market Intervention Attributable to MO	Duration	10	≤ 14	8	4	16	2	Needs Improvement	↓
E. Billing, Settlements and Accounts Management									
Preliminary and Final Settlement Statements	Timeliness	2	98%	99.79%	5	100%	5	Excellent	■
Preliminary Settlement Calculations	Accuracy	2	95%	93.64%	2	98.27%	4	Very Satisfactory	↑
Final Settlement Calculations	Accuracy	3	99%	97.62%	1	99.92%	5	Excellent	↑
	Frequency	2	≤ 6	2	5	1	5	Excellent	■
Meter Data Error Detection	Timeliness	2	98%	100%	5	100%	5	Excellent	■
Monetary	Efficiency	1	0 amount	0	5	0	5	Excellent	■

Category	Measure	Weight (%)	Target	2015		2016			Y-O-Y (Score)
				Actual	Score	Actual	Score		
Transactions			late	amount late		amount late			
	Timeliness	1	0 days late	0 days late	5	0 days late	5	Excellent	■
Margin Call	Timeliness	1	95%	100%	5	0 days late	5	Excellent	■
Default Notice	Timeliness	1	0 days late	0 days late	5	100%	5	Excellent	■
F. Registration and Customer Relations									
Registration	Timeliness	2	95%	97.06%	4	96.67%	4	Very Satisfactory	■
Customer Switching	Timeliness	1	95%	100%	5	100%	5	Excellent	■
Participant Training	Timeliness	2	95%	100%	5	100%	5	Excellent	■
	Feedback	1	90%	95.49%	4	94.80%	4	Very Satisfactory	■
Participant Queries and Data Requests	Timeliness	2	95%	99.02%	5	100%	5	Excellent	■
Participant/ Customer Complaints	Timeliness	2	95%	100%	5	98.51%	4	Very Satisfactory	▼
Over-All Score					4			3	▼

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1. Introduction

This 2016 Annual Market Operator Performance Report provides the results of the monitoring and assessment of the Market Operator's performance for the period 26 September 2015 to 25 September 2016 (4Q 2015 – 3Q 2016).

In accordance with Clause 1.3.2.3 of the Wholesale Electricity Spot Market (WESM) Rules, the PEM Board is mandated to develop the performance standards to monitor and provide indication on the performance of the Market Operator (MO) with respect to its responsibilities under the Electric Power Industry Reform Act (EPIRA) of 2001 and its Implementing Rules and Regulations (IRR), WESM Rules, Philippine Grid Code (PGC) and all other applicable laws, rules and regulations.

With the implementation of PEMC's Integrated Management System (IMS), the MOPS monitoring is included under the Measurement, Analysis and Improvement Processes of the PEMC's Quality Management System (QMS). As such, the MOPS also provides indication that the MO provides quality services and information to its customers.

This report is organized as follows: Section 2 provides an overview of the Market Operator Performance Standards (MOPS). It also describes the tasks involved in the monitoring of the MO's performance, and reporting of findings and recommendations by the Market Assessment Group (MAG), in accordance with Section 10 of the MOPS, to the Management of the Philippine Electricity Market Corporation (PEMC), PEM Audit Committee (PAC), PEM Board, and Department of Energy (DOE). Meanwhile, Section 3 provides the detailed scores for each category and sub-categories, along with the discussion of findings, recommendations and PEMC action plans, which have been discussed with the process owners and the PEMC Management. Comparative ratings for the years 2014 to 2016 are also described. The overall MO performance for the year is provided in Section 4.

2. Monitoring and Reporting

2.1. Performance Standards

The MOPS was initially approved by the PEM Board on 25 May 2011,¹ which was the basis for the internal monitoring of MO performance starting on 26 September 2011. On 21 March 2013, the PEM Board approved the revised MOPS, which was approved as amended by the DOE on 12 November 2013.² This DOE-approved version³ of the MOPS provided the basis for the MO's performance in 2014 covering the period 26 September 2013 to 25 September 2014 (4Q 2013 – 3Q 2014).

This report and the annual report for 2015, which covered the period 26 September 2014 to 25 September 2015 (4Q 2014 – 3Q 2015), are based on the MOPS⁴ as amended and approved by the PEM Board on 22 January 2015⁵ and the DOE on 06 October 2015.⁶

The MO performance standards are classified into six (6) categories with corresponding weights, as follows:

1.	Information Technology (IT) Systems	-	20%
2.	Market Reports and Data Publication	-	15%
3.	Forecast Accuracy	-	20%
4.	Dispatch Scheduling and Pricing	-	20%
5.	Billings, Settlements and Accounts Management	-	15%
6.	Registration and Customer Relations	-	10%

2.2. Data Collection and Validation

Data and supporting information were collected from the relevant PEMC departments, i.e. process owners, who are responsible in carrying out various MO responsibilities. Validations were conducted by cross-checking other data sources and verification of supporting documents, logs and publications, as possible.

The monitoring timeline is concurrent with the monthly WESM billing and settlement timetable, i.e. beginning every 26th day of each month and ending on the 25th day of the next month.

2.3. Evaluation and Reporting

The rating systems under the MOPS, including the performance targets for each category, were utilized in the determination of the MO performance rating (see Appendix A). The overall MO performance rating was computed as the rounded-off sum of the weighted scores computed from the equivalent scores multiplied by the assigned weights of the performance categories.

¹ PEMC-MOPS-001, 2011, approved by the PEM Board in its Resolution No. 2011-39

² DOE Letter dated 12 November 2013 (DOE-JLP-13006301) received by PEMC on 27 November 2013

³ PEMC-MOPS-002, 2013

⁴ PEMC-MOPS, 2015

⁵ PEM Board Resolution No. 2015-03

⁶ DOE Letter dated 06 October 2015 (DOE-ZYM-15000176) received by PEMC on 27 October 2015

The monitoring results were presented to relevant PEMC Departments, the PEMC Management, and PAC. These monitoring reports were submitted on a quarterly and annual basis to said parties, to the PEM Board and DOE. Further, the annual monitoring report is published in the WESM website and is subject to independent review by the external auditor engaged to conduct operational audit on the MO.⁷

Non-achievement of targets are reported internally through Non-conformance, Corrective and Preventive Action Reports (NCPARs) under the IMS to record preventive/corrective action plans and keep track of their progress.

⁷ The 2014 Annual MOPS Report was audited during the 5th Independent Market Operations Audit in 2015.

3. Categories and Ratings

3.1. IT Systems

IT systems cover the availability of the Market Management System (MMS) and the public WESM Website (PW). Table 1 provides the summary of how the MO fared under the measures in this category.

Table 1. IT Systems Performance for the period 4Q 2015 – 3Q 2016

Section	Sub-Category	Target		Actual		Score	Description
3.1.1	Market Management Systems Availability	99.80%	8,766.43 hrs out of 8,784 hrs	99.85%	8,770.85 hrs; 13.15 hrs downtime	3	Satisfactory
3.1.2	WESM Website Availability	99.50%	8,740.08 hrs out of 8,784 hrs	99.87%	8,772.55; 11.45 hrs downtime	5	Excellent

3.1.1. MMS Availability

The various IT components of the MMS is essential in the continuous and efficient communication of the market systems, gathering of market workflow inputs, processing and publication of market outputs and emergency systems.

Aside from the MMS components, the availability of the Wholesale Billing and Settlement System (WBSS) website,⁸ which can be accessed by Market Participants through the MMS digital certificates (DCs), was considered in this measure. The WBSS website is currently being used by market participants to access their meter data and for the generators to declare their bilateral contract quantities (BCQs).

The IT components of the MMS are being administered, maintained and monitored 24x7. As part of its operational functions, PEMC monitors the MMS performance to ensure that the market results are available and published on time.

Participants' complaints or concerns regarding the MMS secured website, or Market Participant Interface (MPI), and the WBSS website are reported through phone calls or emails. In addition, any system malfunction or errors detected internally are likewise immediately reported and addressed.

PEMC uses incident management in reducing or eliminating the effects of actual or potential disturbances in services. As applicable, these incidents are documented through the accomplishment of Incident Reports (IRs) and the filing of requests or concerns internally within PEMC through the use of the in-house developed integrated tool called WIMPSys.⁹ In addition, PEMC's WESM Compliance Officer (WCO) collates these concerns and reports valid complaints under the MOPS (See Section 3.6.5, Participant/Customer Complaints).

⁸ WBSS website may be accessed through either one of the links: Stl1.wesm.ph and Stl2.wesm.ph.

⁹ Work Order, Incident Report, Monitoring Logs and Participant Information System (WIMPSys)

MMS Downtimes

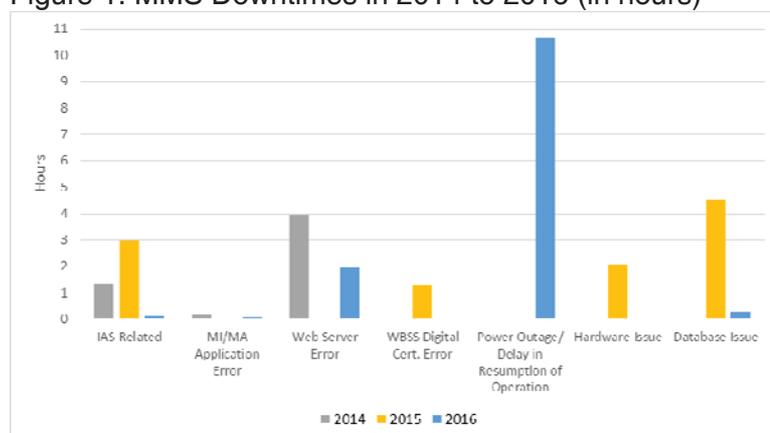
A total of 13.15 hours downtime were recorded in 2016, which were attributed to Internet Authentication Service (IAS)-related restarts, web-server issues, power outage, and database errors. Table 2 provides a summary of the MMS downtimes in 2016.

Table 2. MMS Downtimes in 2016

System	Downtimes	Period / Downtimes in Hours				Total
		Q1 (4Q 2015)	Q2 (1Q 2016)	Q3 (2Q 2016)	Q4 (3Q 2016)	
MMS	Restarting due to increased Internet Authentication Service (IAS) connections			0.13		0.13
	Power outage / Delay in resumption of operations			10.65		10.65
	Database Errors			0.23		0.23
	Application Error				0.12	0.12
WBSS	Database Errors	0.05				0.05
	Server Errors		1.97			1.97
Total		0.05	1.97	11.02	0.12	13.15

As provided in Figure 1, majority of the MMS downtimes in 2016 were caused by the loss of power of the uninterruptible power supply (UPS) of the MMS and the delay in the resumption of market operations in the emergency back-up site (EBS). This resulted to 10.65 hours downtime from 4:30 AM to 3:09 PM on 27 March 2016.¹⁰ The incident was partly due to the phasing issues following the switching of the MO's office building's electricity source from generator sets to MERALCO after its commissioning of a new load breaker switch. Further, the prolonged downtime was also due to the capacity of the UPS, which during the said period depleted faster than expected. The unexpected loss of power of the UPS resulted to damage of some MMS components and necessitated the transfer of operations to the EBS, which took around five (5) hours. To prevent recurrence of the said incident, the MO intends to upgrade its UPS system and enhance its business continuity plan (BCP), and disaster recovery plan (DRP).

Figure 1. MMS Downtimes in 2014 to 2016 (in hours)



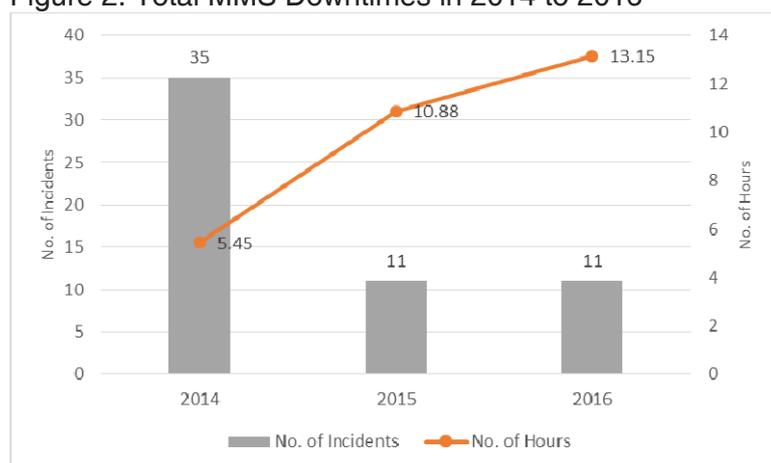
¹⁰ References: 1. Market Operations Report, 05 April 2016, Subject: Market Intervention on 27 March 2016 (0600H-1600H); 2. NCPAR-2016-03-007; 3. IR-1603-00134; and 4. Incident Report on the Implementation of Preventive Maintenance on 27 March 2016 from 3:00 AM to 8:55 AM by the Robinsons Equitable Tower Condominium Corporation.

Meanwhile, downtimes due to the restart of the MPI when there is an increasing number of IAS connections have been a recurring issue since 2012. Restarting the MPI is a preemptive measure undertaken by the MO to prevent prolonged downtimes when the MPI access becomes restricted due to the large number of IAS connections. Despite of this system limitation, the IAS-related downtime in 2016 has significantly decreased (0.13 hours) when compared to 2015 (2.98 hours) and 2014 (1.35 hours).

On the other hand, the WBSS was unavailable for a total of 2.02 hours in 2016, which is a notable decrease from the 4.05 hours downtime recorded in 2015. Of the WBSS downtimes, 1.97 hours are due to server issues, which occurred around midnight on 23 January 2016. In order to prevent the recurrence of WBSS-related errors, PEMC has implemented enhanced internal monitoring processes. In the long term, the Central Registration and Settlement System (CRSS) will replace the WBSS.

In total, there is a significant decrease in the number of incidents from 2014, as provided in Figure 2. On the other hand, an increase in the number of hours corresponding to those incidents was observed this year at 13.15 hours as compared to the 10.88 hours and 5.45 hours downtimes in 2015 and 2014, respectively.

Figure 2. Total MMS Downtimes in 2014 to 2016



Unavailability of the MMS that was caused by third party service providers, such as electricity supply and communication link providers of PEMC, and downtimes that do not require the MMS to restart were excluded.

Monitoring Results

The quarterly availability rating of the MMS for each quarter are provided in Table 3. The MMS availability for 2016 is at 99.85%, which is lower than the 99.88% rating in 2015 and 99.94% in 2014, as provided in Figure 3.

Table 3. MMS Availability for 4Q 2015 – 3Q 2016

Monitoring Period	Total Operating Hours	Target Operating Hours (99.80%)	Performance			
			Actual	Score	Description	
26Sep15 - 25Dec15	2,184.00	2,179.63	2,183.95 hrs (0.05 hrs downtime)	100%	5	Excellent
26Dec15 - 25Mar16	2,184.00	2,179.63	2,182.03 hrs (1.97 hrs downtime)	99.91%	4	Very Satisfactory
26Mar16 - 25Jun16	2,208.00	2,203.58	2,196.98 hrs (11.02 hrs downtime)	99.50%	1	Poor
26Jun16 - 25Sep16	2,208.00	2,203.58	2,207.88 hrs (0.12 hrs downtime)	99.99%	5	Excellent

Figure 3. MMS Availability (YTD) in 2014 to 2016



3.1.2. WESM Website Availability

The Public Website (PW), or the Market Information Website (www.wesm.ph), is the facility and electronic communication system wherein PEMC publishes information that may be accessed by WESM Members, interested parties and the general public.

In January 2016, PEMC launched an enhanced PW interface, which features new graphical and interactive front end data functions and displays that are envisioned to provide users easier, faster and clearer access to varied electricity market data.¹¹

In measuring its availability, downtimes attributed to or caused by third parties are excluded since these are beyond the control of the MO.

¹¹ WESM Bulletin 2016. Issue No. 2

Similar to the monitoring of MMS Availability, participants' complaints or concerns regarding the WESM website are reported through phone calls or emails. PEMC departments immediately report such complaints through IRs, as applicable.

WESM Website Downtimes

Downtimes refer to the number of hours or incidents when the WESM website is not accessible to internal and/or external parties. For the current year, these are due to web-service and firewall issues, and hardware issue due to high loading of servers, as provided in Table 4.

Table 4. WESM Website Downtimes in 2016

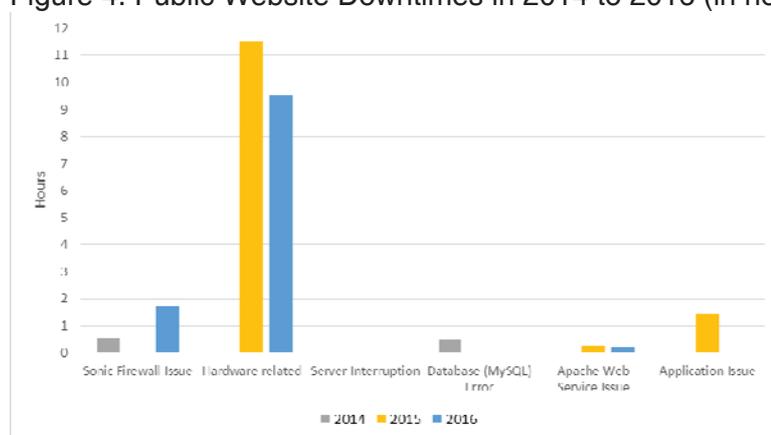
Downtimes	Period / Downtimes in Hours				Total
	Q1 (4Q 2015)	Q2 (1Q 2016)	Q3 (2Q 2016)	Q4 (3Q 2016)	
Apache Web Service issue	0.20				0.20
Sonicwall Firewall issue	1.23	0.50			1.73
Hardware issue		1.37		8.15	9.52
Total	1.43	1.87		8.15	11.45

Most of the downtimes in 2016, at 9.52 hours, were attributable to the high usage of the central processing unit (CPU) and server especially during 3Q 2016 (Q4). Review by the MO identified a configuration error in the server resulting to slow performance, which is further aggravated by the high server loading. To address the issues, the MO reconfigured the server and developed a detailed work instruction to restart the said equipment during such incidents.

During the year, two instances of PW downtimes were recorded due to firewall issue. The first incident, which occurred in 4Q 2015 (Q1), was resolved by remotely loading the latest firewall configuration for about 1.23 hours. The second incident, which occurred in 1Q 2016 (Q2), was due to the recent change in the configuration of the firewall resulting to a downtime of about 0.50 hours of the PW.

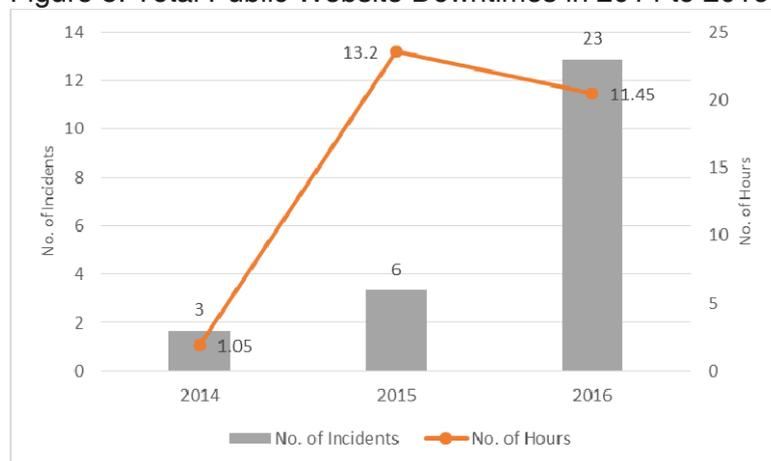
As presented in Figure 4, downtimes due to server interruption, database errors and application issues did not recur in 2016. Hardware related issues decreased from 11.55 hours in 2015 to 9.52 hours in 2016. However, firewall issues increased to 1.73 hours in 2016 from having no incidents in 2015 and 0.55 hours downtime in 2014.

Figure 4. Public Website Downtimes in 2014 to 2016 (in hours)



In terms of the total number of incidents related to PW downtimes, there is a significant increase from 3 in 2014 to 23 in 2016, as provided in Figure 5. On the other hand, there is a decrease in the number of downtimes in hours, from 13.2 hours in 2015 to 11.45 hours in 2016. This reflects the several but brief incidents within the 3rd quarter of 2016 related to hardware issues.

Figure 5. Total Public Website Downtimes in 2014 to 2016



Monitoring Results

The availability rating of the PW for each quarter are provided in Table 5. Figure 6 provides that the 2016 PW availability is Excellent at 99.87%, which is higher than the 99.85% rating in 2015, it is lower than the 99.99% rating in 2014.

Table 5. WESM Website Availability for 4Q 2015 - 3Q 2016

Monitoring Period	Total Operating Hours	Target Operating Hours (99.50%)	Performance			
			Actual	Score	Description	
26Sep15 - 25Dec15	2,184.00	2,173.08	2,182.57 hrs (1.43 hrs downtime)	99.93%	5	Excellent
26Dec15 - 25Mar16	2,184.00	2,173.08	2,182.13 hrs (1.87 hrs downtime)	99.91%	5	Excellent
26Mar16 - 25Jun16	2,208.00	2,196.96	2,208.00 hrs	100%	5	Excellent
26Jun16 - 25Sep16	2,208.00	2,196.96	2,199.85 hrs (8.15 hrs downtime)	99.63%	3	Satisfactory

Figure 6. Public WESM Website Availability (YTD) in 2014 to 2016



3.1.3. Recommendations: IT Systems

With the forthcoming deployment of the new MMS, it is recommended that the MOPS for MMS availability be reviewed and revised according to the expected performance of the new system and its respective modules and functionalities. Primarily, it is recommended that the current operational availability measure be maintained, wherein the availability that the Trading Participants actually experiences while trading in the WESM through the MPI is measured.

In consideration of the modular design of the new MMS, the MO may also explore methods of determining function-level availability to ensure that all components meet their availability requirements individually, as well as collectively.¹²

3.1.4. PEMC Action Plans: IT Systems

PEMC has endeavored to undertake the following action plans to mitigate the occurrence of MMS and PW downtimes:

A. Action Plans to improve MMS Availability

- Continuing monitoring of the number of IAS connections in relation to the PEMC Management’s decision to accept the inherent limitations of the MMS as one of the factors causing MMS availability issues.
- Review monitoring criteria for MMS availability in relation to the implementation of the new MMS.
- Development and implementation of enhanced BCP and DRP.

¹² References: 1) Creating a More Accurate IT Availability Definition by iSixSigma.com; and 2) System Reliability and Availability by EventHelix.com

- Ongoing development of the NMMS and CRSS.
- B. Action Plans to improve both MMS and PW Availability
- Continuing coordination in addressing, resolving and reporting participant complaints.
 - Continuing implementation of enhanced processes for systems monitoring and maintenance.

3.2. Market Reports and Data Publication

Market participants rely on market information for them to make informed business decisions, whether it be on electricity trading or making long term electricity industry investments. Readily available information are also helpful to the DOE and Energy Regulatory Commission (ERC) in their policy and regulatory decisions, respectively. Thus, making market information available through timely publication is essential in maintaining the transparency in the operations of the WESM.

The MO is required to publish various market information, in accordance with the WESM Rules, market manuals and policy/regulatory directives. The list of market information for publication is provided in Annex D of the MOPS document.

"Publication" as defined in the WESM Rules is "to make available information". While there are other means to make available information¹³, for the purposes of this MOPS monitoring, publication of market reports and data is interpreted to being made through the PW, MPI, email, and newspaper of general circulation, as applicable.

The requirement to publish market information, in market reports format or in data format, is measured under the MOPS based on availability and timeliness. Published market reports and data that were considered in the "Timeliness" measure are those with a prescribed timeline for publication in corresponding enabling rules/guidelines. On the other hand, all publications are considered in the "Availability" measure, including those that have remained unchanged since its first publication (such as WESM Manuals, e.g. procedures for calculating constraint violation coefficients).

The following table provides the summary on how the MO fared in this category.

Table 6. Market Reports and Data Publication Performance Rating for 4Q 2015 – 3Q 2016

Section	Sub-Category	Target	Actual	Score	Description
3.2.1	Availability of Market Reports and Data Publication	95% (45 publications)	99.99% 38 publications 8 publications are excluded	4	Very Satisfactory
3.2.1	Timeliness of Market Reports and Data Publication	95% (33 publications)	> 95% 25 publications 8 publications are excluded	4	Very Satisfactory

Eight (8) publications were excluded from the monitoring for availability and timeliness, as shown in Table 7.

¹³ Publication is also done via data sharing or file transfer facility to market participants who have availed of this paid service. Data sharing or file transfers of MMS-generated and other market data and/or reports are provided to the monitoring systems of the DOE and ERC.

Table 7. List of Market Information Excluded in the Rating

Required Publication	Reason for Exclusion (in Measure)
1. Suspension Notice	No suspended WESM Participant in 2016. (Availability)
2. Notice of Deregistered WESM Participants	No deregistered WESM Participant in 2016. (Availability and Timeliness)
3. Formulation of the Market Dispatch Optimization Model (MDOM)	Price Determination Methodology (PDM) published since 2Q 2012, particularly when the new public WESM website was launched. (Timeliness)
4. Generator and Line Outages, Security Limits and Contingency Lists as submitted by SO to the MMS	Monitoring yet to be established, in coordination with the System Operator (SO). (Availability and Timeliness)
5. Real-Time System Condition or System Operator Advisory	
6. System Operator Advisory (Updated Daily or upon availability of verified/ complete information)	
7. Substitute prices for PSM for congestion related pricing errors in the MPI near real-time	Monitoring yet to be established. (Availability and Timeliness)
8. Substitute prices for PSM for congestion related pricing errors in the WESM website daily	Already covered in other publications. (Availability and Timeliness)
9. Other system data that will be published includes the following: <ul style="list-style-type: none"> • Total energy dispatched • Total dispatchable load • Total reserve required per time point (for each class and area) • Total system losses • Reserve requirements • Locational marginal prices 	

3.2.1. Availability of Market Reports and Data

Availability pertains to the actual number of publications against the total number of required publications for each of the 38 publications monitored. The average of the availability ratings for the 38 publications provides the basis for rating this measure, such that regardless of the volume of the published market information, all 38 publications have equal weights.

Monitoring Results

The YTD availability ratings of market reports and data for each quarter are provided in Table 8. The availability rating for 2016 is at 99.99%, which is higher than the 99.97% rating in 2015 and 99.95% in 2014, as provided in Figure 7.

Table 8. Availability of Market Reports and Data for 4Q 2015 - 3Q 2016

Monitoring Period	Target	Performance		
		Actual	Score	Description
26Sep15 - 25Dec15	95%	99.99%	4	Very Satisfactory
26Dec15 - 25Mar16		98.57%	4	Very Satisfactory
26Mar16 - 25Jun16		99.98%	4	Very Satisfactory
26Jun16 - 25Sep16		100%	5	Excellent

Figure 7. Availability of Market Reports and Data (YTD) in 2014 to 2016



3.2.2. Timeliness of Market Reports and Data Publication

Timeliness of market information publication refers to the MO's compliance to the required timing of publication of market information in accordance to the schedules under the WESM Rules, Manuals, internal procedures or the MOPS document. Similar to the calculation of availability in Section 3.2.1, timeliness pertains to the actual number of timely publications against the total number of required publications for each of the 25 publications monitored. The average of the timeliness ratings for the 25 publications provides the basis for rating for this measure, such that regardless of the volume of the published information, all 25 publications have equal weights.

Monitoring Results

The over-all timeliness rating of market reports and data in 2016 is greater than 95%.¹⁴ Three (3) publications rated below the target timeliness rating. These were subsequently rectified, as follows:

1. Structure and level of market fees and the methods used in determining the structure – The ERC Order dated 09 February 2016 regarding CY 2014 Market Fees was due for publication on or before 25 March 2016. It was published on 25 May 2016.
2. Summary of Pricing Error Notice (PEN) Issuance – Under the Market Manual on PEN issuance,¹⁵ this is being required to be published within two (2) business days after the trading day. However, actual publication of this market information follows a timeline based on 2 working days, which considers weekends and holidays, since this report provides ex-post market information. To reflect the actual timeline of publication, PEMC submitted proposed changes to the said Market Manual on 19 October 2016 to the Rules Change Committee (RCC).¹⁶
3. Summary of Price Substitution Methodology (PSM) Issuance – Under the Market Manual on PSM issuance,¹⁷ this is being required to be published within two (2) business days after the trading day. Similar with item 2 above, the actual publication of this market information follows a timeline based on 2 working days. Together with the aforementioned rules change proposal, PEMC also submitted proposed changes to the PSM Manual to reflect the actual timeline of publication of the PSM Summary.

3.2.3. Recommendations: Market Reports and Data Publication

The following recommendations were discussed with the process owners:

1. Ensure that process objectives in the internal business procedures provide the publication timelines which are consistent with the requirements under the WESM Rules and Manuals.
2. Determine manner of reporting and monitoring of above-cited exempted publications (items 2 to 6 in Table 7).
3. Review Satisfactory range for the Rating System used in this measure since it includes values which are below the target (i.e. Satisfactory range is 90% to 95%, while the target is 95%).

3.2.4. PEMC Action Plan: Market Reports and Data Publication

PEMC will be undertaking the first two (2) recommendations while the latter items will be considered in the annual review of the MOPS in 2016.

¹⁴ Timeliness rating for 2 publications are still subject to further validation and confirmation.

¹⁵ Criteria and Guidelines for the Issuance of Pricing Error Notices and Conduct of Market Re-Run, Issue 1

¹⁶ PEMC Proposed Amendments To The WESM Manuals On Pricing Error Notice And Price Substitution Methodology - Discussion Paper (ORCP-WM-16-23)

¹⁷ Methodology for Determining Pricing Errors and Price Substitution due to Congestion for Energy Transactions in the WESM, Issue 4

3.3. Forecast Accuracy

As cited in the 4th MO Audit Report on Market Software Testing, load forecasting is a key determinant of market prices and schedules, and therefore must be as accurate as is reasonably possible. Any difference between the forecast load and the actual load represents an economic cost to the market in that either too much or too little generation is scheduled.

The MO currently prepares and publishes week ahead (WAP), day ahead (DAP) and hour ahead (RTD) market projections to forecast load scenarios considering various factors (e.g. network service provider data, reserve requirements, generation offer, among others).

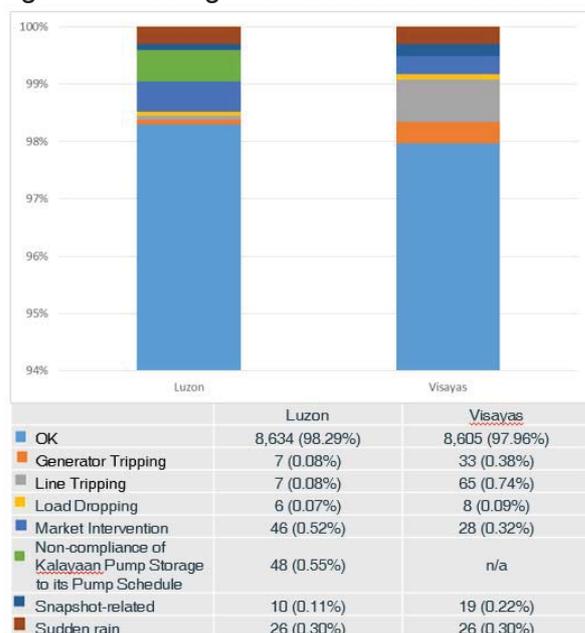
As provided in the MOPS, however, only the DAP and RTD projections shall be measured as to their accuracy. The RTD accuracy is measured in terms of Mean Average Percent Error (MAPE) and Forecast Accuracy Rate (FAR) while the DAP accuracy is measured with the MAPE only. Both RTD and DAP are measured per region, i.e. Luzon and Visayas. The ratings for these sub-categories are provided in Table 9.

Table 9. Forecast Accuracy Performance Ratings for the 4Q 2015 – 3Q 2016

Section	Sub-Category	Target	Region	Actual	Score	Description
3.3.1	RTD Forecast - MAPE	0.95%	Luzon	0.80%	4	Very Satisfactory
		1.20%	Visayas	1.50%	2	Needs Improvement
	RTD Forecast - FAR	97.20%	Luzon	98.64%	5	Excellent
		93.00%	Visayas	89.70%	2	Needs Improvement
3.3.2	DAP Forecast - MAPE	1.60%	Luzon	1.36%	4	Very Satisfactory
		2.20%	Visayas	2.00%	4	Very Satisfactory

The assessment of forecast accuracy in this report considered exclusions that were provided in the MOPS. Out of the 8,784 total intervals for 4Q 2015 – 3Q 2016, 8,634 intervals were considered for the purpose of this monitoring of the accuracy of RTD/DAP for Luzon while 8,605 were considered for Visayas. Figure 8 provides the number of trading intervals considered (marked as “OK”) and excluded in the monitoring of forecast accuracy.

Figure 8. Trading Intervals Considered and Excluded in 2016



3.3.1. RTD Forecast

The hour ahead forecast or the RTD forecast is one (1) of the variables that are used to determine the ex-ante schedules and prices for the target trading interval. For clarity, it is noted that the data used in the computation of RTD forecast accuracy is the MMS generated forecast for Luzon and Visayas.¹⁸ The said regions are measured separately since RTD is published on a regional basis. The accuracy is measured against the actual demand based on snapshot data of all generators at minute 59,¹⁹ as follows:

- MAPE - reflects the average of the absolute percent difference between the actual and forecasted demand across all intervals
- FAR - reflects the number of intervals in percent wherein the forecast is within the MAPE tolerance level, which is set at $\pm 3\%$.

Monitoring Results

Table 10 provides that the MO maintained MAPE ratings of less than 0.95% in all quarters for Luzon. As provided in Figure 9, the Luzon RTD-MAPE for 2016 is at 0.80%, which is a bit lower than the MAPE in 2015 at 0.79%.²⁰

On the other hand, RTD-MAPE in Visayas had a decreasing trend throughout the year due to the occurrence of negative losses, which started to occur in February 2016. The issue was found to be attributable system limitation on the allowable number of generators that can be modelled in the MMS, which was only found out by the MO when a significant number of renewable energy plants were registered in the WESM and integrated in the Market Network Model (MNM). To address the issue, the MO coordinated with the MMS Provider (ABB) and deployed a software patch during the last week of September 2016. Figure 10 shows that the Visayas RTD-MAPE for 2016 is at 1.50%, which is significantly lower than the MAPE in 2015 at 1.16%.

Table 10. RTD-MAPE for 4Q 2015 - 3Q 2016

Monitoring Period	Performance (MAPE)							
	Target	Actual	Score	Description	Target	Actual	Score	Description
	Luzon				Visayas			
26Sep15 - 25Dec15	0.95%	0.74%	4	Very Satisfactory	1.20%	1.01%	4	Very Satisfactory
26Dec15 - 25Mar16		0.79%	4	Very Satisfactory		1.39%	2	Needs Improvement
26Mar16 - 25Jun16		0.83%	4	Very Satisfactory		2.08%	1	Poor
26Jun16 - 25Sep16		0.82%	4	Very Satisfactory		1.53%	2	Needs Improvement

¹⁸ Previously, hourly load forecasts that are inputs to the MMS (LDF or LDP) were used, in accordance with the MOPS, Issue 1.0.

¹⁹ In the absence of 59th minute snapshot data, the 54th minute snapshot data before the target hour or the 4th minute snapshot data of the target trading interval could be used. As an example, the 1559H or 1554H or 1604H snapshot data shall be used as actual demand for the 1600H interval.

²⁰ 2014 RTD-MAPE ratings are provided in Figures 10 and 11 but are not discussed since these were based on a different rating system.

Figure 9. RTD-MAPE (YTD) for Luzon in 2014 to 2016



Figure 10. RTD-MAPE (YTD) for Visayas in 2014 to 2016



Consequently, the RTD-FARs for Luzon and Visayas as provided in Table 11 reflect the MAPE ratings discussed above. In total, there were 117 intervals out of 8,634 valid intervals in Luzon and 886 out of 8,605 valid intervals in Visayas that had RTD forecasts beyond the +/- 3% MAPE tolerance level. As provided in Figure 11 and Figure 12, this resulted to RTD-FARs of 98.64% and 89.70% in Luzon and Visayas, respectively. Comparing the 2016 ratings with 2015, the Very Satisfactory rating for Luzon was maintained while the rating for Visayas dropped to Needs Improvement.

Table 11. RTD-FAR for 4Q 2015 - 3Q 2016

Monitoring Period	Performance (FAR)							
	Target	Actual	Score	Description	Target	Actual	Score	Description
	Luzon				Visayas			
26Sep15 - 25Dec15	97.20%	98.28%	4	Very Satisfactory	93.00%	97.39%	5	Excellent
26Dec15 - 25Mar16		98.66%	5	Excellent		91.49%	2	Needs Improvement
26Mar16 - 25Jun16		98.66%	5	Excellent		81.21%	1	Poor
26Jun16 - 25Sep16		98.98%	5	Excellent		88.83%	1	Poor

Figure 11. RTD-FAR (YTD) for Luzon in 2014 to 2016

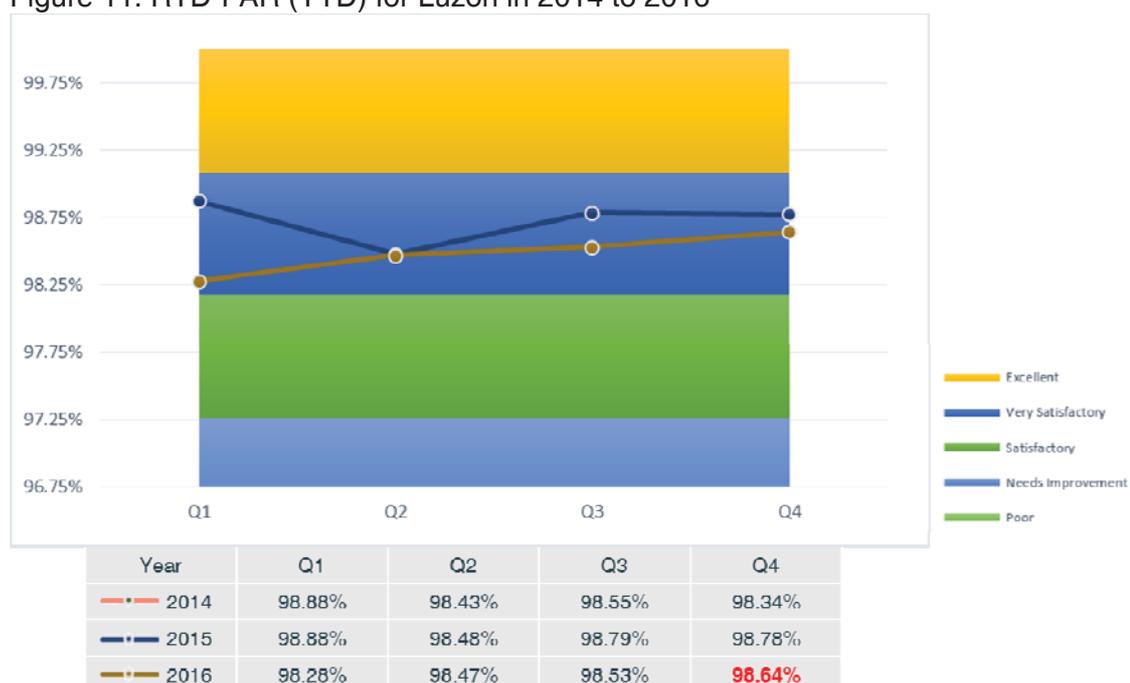
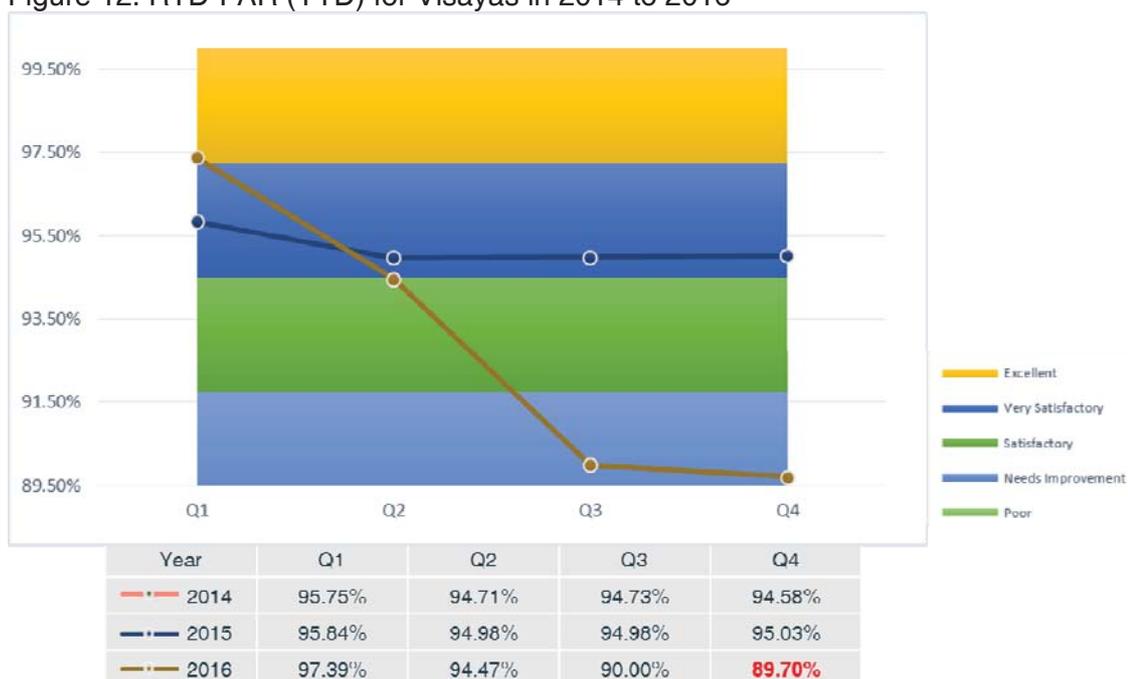


Figure 12. RTD-FAR (YTD) for Visayas in 2014 to 2016



3.3.2. DAP Forecast

The DAP MAPE is used to measure the accuracy of DAP forecast. For clarity, the data used in the computation of DAP MAPE is the Similar Day Load Forecast (SDLF) Demand for Luzon and Visayas. As with the computation of RTD Forecast, the accuracy of DAP Forecast is measured against the actual demand based on snapshot data of all generators at minute 59.

Monitoring Results

Table 12 shows that the MO was within the target MAPE of less than 1.60% in Luzon and 2.20% in Visayas in all quarters. As provided in Figure 13 and Figure 14, the Very Satisfactory DAP-MAPE ratings for Luzon and Visayas were maintained from 2015 to 2016.

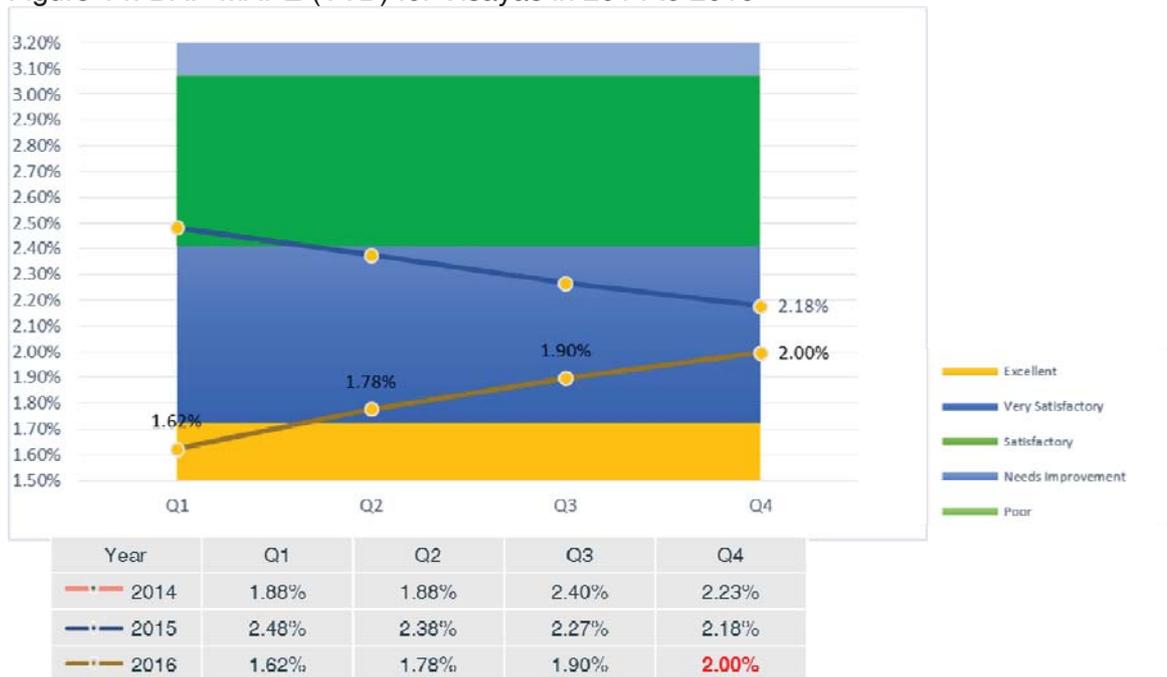
Table 12. DAP-MAPE for 4Q 2015 - 3Q 2016

Monitoring Period	Performance (MAPE)							
	Target	Actual	Score	Description	Target	Actual	Score	Description
	Luzon				Visayas			
26Sep15 - 25Dec15	1.60%	1.40%	4	Very Satisfactory	2.20%	1.62%	5	Excellent
26Dec15 - 25Mar16		1.31%	4	Very Satisfactory		1.93%	4	Very Satisfactory
26Mar16 - 25Jun16		1.28%	4	Very Satisfactory		2.14%	4	Very Satisfactory
26Jun16 - 25Sep16		1.47%	3	Satisfactory		2.29%	4	Very Satisfactory

Figure 13. DAP-MAPE (YTD) for Luzon in 2014 to 2016



Figure 14. DAP-MAPE (YTD) for Visayas in 2014 to 2016



3.3.3. Recommendation: Forecast Accuracy

While the accuracy of DAP system forecasts have improved, the implementation of nodal forecasting, which has been consistently advocated in the MO audit reports, is recommended to further enhance market operations. This is likewise provided under the DOE directives on the enhancements to WESM design and operations under DOE Circular 2015-10-0015.²¹

3.3.4. PEMC Action Plans: Forecast Accuracy

Consistent with the said DOE directive, the implementation of nodal forecasting is considered in the ongoing development of the NMMS.

3.4. Dispatch Scheduling and Pricing

This category deals with the market scheduling and pricing performance by the MO. It is particularly important that market processes be properly managed because of its impact to participant behavior and market outcome. As such, this category is measured in terms of the success in implementing RTD and real-time ex-post (RTX) workflow processes, timeliness of pricing error issuance and the duration of market intervention (MI) attributable to the MO, as provided in Table 13.

Table 13. Dispatch Scheduling and Pricing Performance Ratings for 4Q 2015 – 3Q 2016

Section	Sub-Category	Target	Actual	Score	Description
3.4.1	RTD Workflow Successful Run	99.75%	100%	5	Excellent
3.4.2	RTX Workflow Successful Run	99.75%	100%	5	Excellent
3.4.3	Timeliness of Pricing Errors and Market Re-runs before the issuance of Preliminary Statements	98.50%	99.17%	4	Very Satisfactory
	Timeliness of Pricing Errors and Market Re-runs before the issuance of Final Statements	99.50%	100%	5	Excellent
3.4.4	Number of Market Intervention (MI) Attributable to MO	≤ 14	16	2	Needs Improvement

3.4.1. RTD Workflow

Since the RTD workflow process is run at an hourly interval, its success rate is evaluated by the number of trading intervals with resulting schedule completed within the timetable. These include RTD runs that were manually run by PEMC within the timetable.

Under the MOPS, unsuccessful RTD runs that are attributable to factors beyond the control of MO (e.g. attributable to the SO and communication failure by service providers) are excluded from the calculations. Further, RTD runs with MI attributable to the MO are excluded in the trading intervals considered.

²¹ Providing Policies for Further Enhancement of the Wholesale Electricity Spot Market (WESM) Design and Operations (DOE DC-2015-10-0015) dated 23 October 2015.

Monitoring Results

The MO maintained a 100% success rate for RTD workflow runs from 2014 to 2016. For the current year, the excluded trading intervals due to the occurrence of market intervention include those attributed to the MO as enumerated in Section 3.4.4.

3.4.2. RTX Workflow

The ex-post run or RTX workflow is measured in the same manner as with the RTD workflow process.

Monitoring Results

The MO rated 100% success rate for RTX workflow runs in 2015. Figure 15 provides that the rating for this measure improved from 2015.

Figure 15. RTX Successful Runs (YTD) in 2014 to 2016



3.4.3. Pricing Errors and Market Re-runs

This sub-category particularly refers to the process of validation of intervals with PENs and the timely completion of market re-runs (MRR) prior to the issuance of preliminary and final settlements for Luzon and Visayas.

Monitoring Results

As provided in Table 14, the issuance of prices for the Preliminary Settlement Statements rated below the target 98.50% in the first half of the year but later improved in the latter half. The resulting 2016 annual rating is at 99.17%, Very

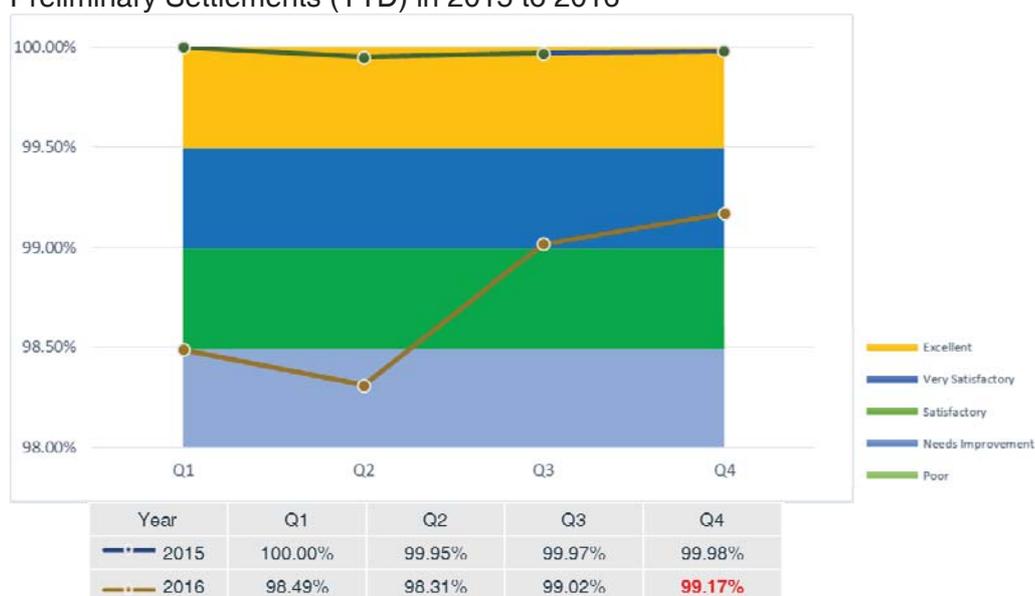
Satisfactory, which is lower than the 2015 rating of 99.98%, as provided in Figure 16.²²

On the other hand, the MO retained the 100% timeliness rating for the issuance of prices for the Final Settlement Statements from 2015 to 2016, which is higher than the 99.98% rating in 2014 as provided in Figure 17.²³

Table 14. Timely Issuance of Pricing Errors and Conduct of Market Re-run

Monitoring Period	Performance (Prelim)				Performance (Final)			
	Target	Actual	Score	Description	Target	Actual	Score	Description
26Sep15 - 25Dec15	98.50%	98.49%	2	Needs Improvement	99.50%	100%	5	Excellent
26Dec15 - 25Mar16		98.10%	2	Needs Improvement		100%	5	Excellent
26Mar16 - 25Jun16		100%	5	Excellent		100%	5	Excellent
26Jun16 - 25Sep16		99.86%	5	Excellent		100%	5	Excellent

Figure 16. Timely Issuance of Pricing Errors and Conduct of Market Re-runs for Preliminary Settlements (YTD) in 2015 to 2016



²² The reported rating for this measure in the 2015 MOPS Annual Report is amended from 100% to 99.98% due to corrections in data. In addition, this measure was monitored starting in 2015, thus, there is no rating for this measure in 2014.

²³ The reported rating for this measure in the 2015 MOPS Annual Report is amended from 99.98% to 100% due to corrections in data.

Figure 17. Timely Issuance of Pricing Errors and Conduct of Market Re-runs for Final Settlements (YTD) in 2014 to 2016



3.4.4. Market Intervention Attributable to MO

The duration or frequency of MIs that are attributable to the MO is being monitored to ensure that the WESM is operational 24x7. The allowable number of MIs in a year is equal to or less than 14 trading intervals.

Among the market interventions during the year, 16 were attributable to the MO, as provided in Table 15.

Table 15. MO Initiated Market Interventions for 4Q 2015 - 3Q 2016

Date/Affected Intervals	Affected Region/Cause	MO-Attributed
October 18, 2015 H13, H14, H15, H16	Luzon / Outage of San Jose - Tayabas 500kV Lines 1 and 2.	
December 3, 2015 H02	Luzon-Visayas / Inappropriate input data on Dolores Loads	
December 29, 2015 H20	Luzon-Visayas / MMS internal application problem	✓
January 14, 2016 H24 January 15, 2016 H1, H2, H3, H4, H5	Luzon-Visayas / Workflow stoppage caused by inappropriate input data.	
February 3, 2016 H03	Luzon-Visayas / MMS internal application problem	✓
March 11, 2016 H12	Luzon / Non-implementable RTD results	✓
March 27, 2016 H06 - H16	Luzon-Visayas / No RTD generated by MMS	✓
April 21, 2016 H22	Luzon-Visayas / RTD workflow stoppage caused by bad system snapshot data	
April 23, 2016 H07	Luzon / Non-implementable RTD results (opening of San Manuel EHV breakers)	
May 13, 2016 H22	Luzon-Visayas / MMS system and database problems	✓
July 30, 2016	Luzon / Manual Load Dropping	

Date/Affected Intervals	Affected Region/Cause	MO-Attributed
H11-H16		
August 5, 2016 H11-H18	Luzon / Manual Load Dropping	
August 30, 2016 H16	Luzon-Visayas / MMS internal application problems	✓
September 6, 2016 H14-H17	Luzon / Manual Load Dropping	

Monitoring Results

Table 16 provides a summary of the above-mentioned MO-attributable MIs per quarter while Figure 18 shows the YTD rating from 2014 to 2016. The significant decrease in rating from Excellent in 2014 to Needs Improvement in 2016 reflects the need to enhance the MMS and related processes. Most of the downtimes in 2016 are related to the incident due to the power outage and delayed resumption of operations in the EBS on 27 March 2016, which is discussed in Section 3.1.1.

Table 16. Market Intervention Attributable to MO for 4Q 2015 - 3Q 2016

Monitoring Period	Performance			
	Target	Actual	Score	Description
26Sep15 - 25Dec15	≤ 14	0	5	Excellent
26Dec15 - 25Mar16		3	5	Excellent
26Mar16 - 25Jun16		12	3	Satisfactory
26Jun16 - 25Sep16		1	5	Excellent

Figure 18. Market Intervention Attributable to MO (YTD) in 2014 to 2016



3.4.5. Recommendations: Dispatch Scheduling and Pricing

The revised market rules for the implementation of enhanced market design and operations, as well as the deployment of the new MMS, are recommended to be considered in the review of the MOPS.

3.4.6. PEMC Action Plans: Dispatch Scheduling and Pricing

Action plans mentioned in Section 3.1.4 also facilitates the improvement of the MO's systems and processes on dispatch scheduling and pricing.

3.5. Billings, Settlements and Accounts Management

This category is related to the financial aspect of the WESM operations. It is essential that the MO handle financial transactions of the WESM with utmost integrity and efficiency considering the possible financial impact of the transactions to the Market Participants. The MOPS provides that this category be measured in terms of timeliness, frequency and accuracy. The ratings for the sub-categories under this major category are summarized below.

Table 17. Billings, Settlement and Accounts Management Performance Ratings for 4Q 2015-3Q 2016

Section	Sub-Category	Target	Actual	Score	Description
3.5.1	Timeliness of Preliminary and Final Settlement Statements	98%	100.00%	5	Excellent
3.5.2	Accuracy of Preliminary Settlement Calculations	95%	98.27%	4	Very Satisfactory
	Accuracy of Final Settlement Calculations	99%	99.92%	5	Excellent
3.5.3	Frequency of Final Settlement Adjustments	≤ 6	1	5	Excellent
3.5.4	Timeliness of Meter Data Error Detection	98%	100%	5	Excellent
3.5.5	Remittance Efficiency	0 amount late	0 amount late	5	Excellent
	Timeliness of Monetary Transactions	0 days late	0 days late	5	Excellent
3.5.6	Timeliness of Margin Call	0 days late	0 days late	5	Excellent
	Timeliness of Default Notice	100%	100%	5	Excellent

For reference, Table 18 provides the relevant dates and WESM billing periods that are covered in each monitoring period for this section.

Table 18. WESM Billing Periods covered in the MOPS for 4Q 2015 - 3Q 2016

Monitoring Period	Covered Billing Periods	Billing Period	Dates
26Sep15 - 25Dec15	111 - 113	111	26 August 2015 to 25 September 2015
		112	26 September 2015 to 25 October 2015
		113	26 October 2015 to 25 November 2015
26Dec15 - 25Mar16	114 - 116	114	26 November 2015 to 25 December 2015
		115	26 December 2015 to 25 January 2016
		116	26 January 2016 to 25 February 2016
26Mar16 - 25Jun16	117 - 119	117	26 February 2016 to 25 March 2016
		118	26 March 2016 to 25 April 2016
		119	26 April 2016 to 25 May 2016
26Jun16- 25Sep16	120 - 122	120	26 May 2016 to 25 June 2016
		121	26 June 2016 to 25 July 2016
		122	26 July 2016 to 25 August 2016

3.5.1. Timeliness of Preliminary and Final Settlement Statements

The WESM Rules require that Preliminary Settlement Statements are issued within 7 days after the end of each billing period. It also provides that the issuance of Final Settlement Statements should not be later than 18 days after the end of each billing period. Further, if the deadline falls on a Non-Working Day, the issuance of the settlement statements shall be made during the next immediate Working Day.

Monitoring Results

The MO scored 100% timeliness rating for the issuance of Preliminary and Final Statements in all quarters. Figure 19 presents the favorable YTD ratings from 2014 to 2016.

Figure 19. Timeliness of Prelim and Final Settlement Statements Issuance (YTD) in 2014 to 2016



3.5.2. Accuracy of Preliminary and Final Settlement Calculations

Given the possible financial impact of WESM settlement statements, the MO is rated according to the accuracy of issued billing statements. Accuracy rating of Preliminary Settlements is computed as the mean of the absolute percentage error of the preliminary settlement total trading amount (TTA) and the final settlement TTA per participant invoice.

The adjustments related to claims for additional compensation for Administered Prices (AP) and must run units (MRUs) are excluded, as well as the adjustments due to corrections in meter quantities that are attributable to the metering service provider (MSP).

Monitoring Results

As provided in Table 19, the MO's accuracy rating for preliminary statements met the target 95% in all quarters. Figure 20 illustrates that the accuracy for preliminary statements has improved since 2014, with the annual rating for 2016 at 98.27% (Very Satisfactory).

Table 19. Accuracy of Preliminary Settlement Statements for 4Q 2015 - 3Q 2016

Monitoring Period	Performance			
	Target	Actual	Score	Description
26Sep15 - 25Dec15	95%	96.62%	3	Satisfactory
26Dec15 - 25Mar16		99.63%	5	Excellent
26Mar16 - 25Jun16		98.41%	5	Excellent
26Jun16 - 25Sep16		98.41%	5	Excellent

Figure 20. Accuracy of Preliminary Settlement Statements (YTD) for 2014 to 2016



Likewise, the target accuracy rating for Final Settlements was achieved in all quarters, as provided in Table 20. The slight decrease in accuracy in 2Q 2016 (Q2) reflects the change in the Final Settlement Statement for the 118th billing period (see Section 3.5.3. Meanwhile, Figure 21 presents that the annual accuracy rating has improved from 97.62% (Poor) in 2015 to 99.92% (Excellent) this year.

Table 20. Accuracy of Final Settlement Statements for 4Q 2015 - 3Q 2016

Monitoring Period	Target	Actual	Score	Description
26Sep15 - 25Dec15	99%	100%	5	Excellent
26Dec15 - 25Mar16		100%	5	Excellent
26Mar16 - 25Jun16		99.69%	5	Excellent
26Jun16 - 25Sep16		100%	5	Excellent

Figure 21. Accuracy of Final Settlement Statements (YTD) for 2014 to 2016



3.5.3. Frequency of Adjustments in Final Settlement Calculations

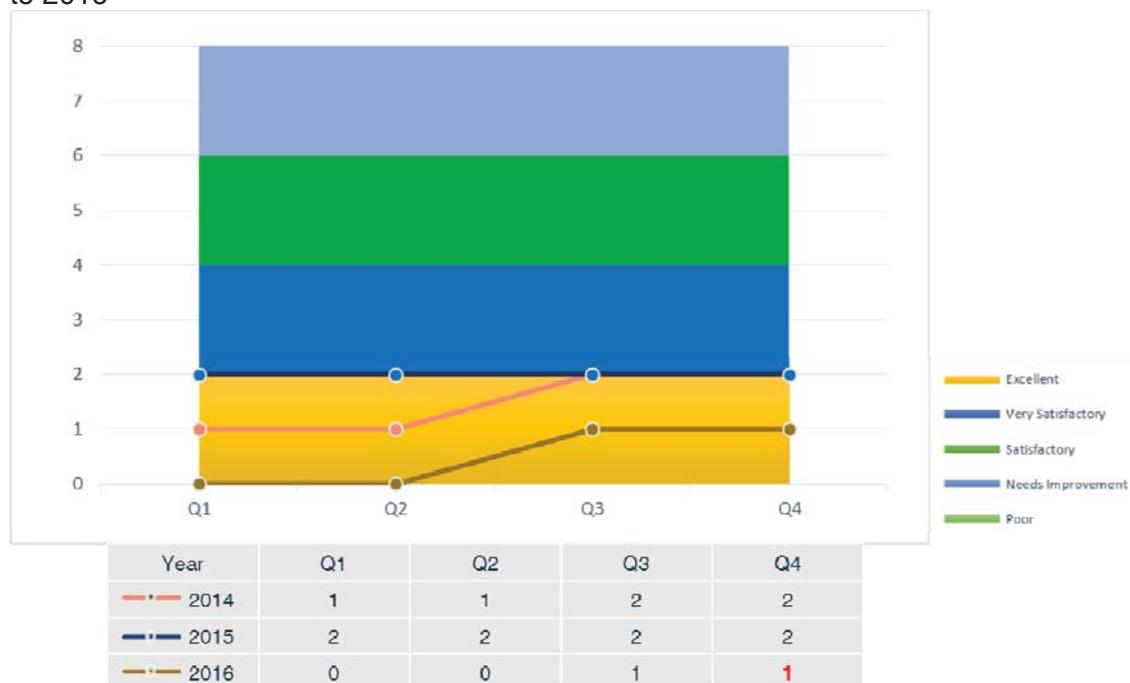
Final settlement statements are also evaluated according to the number of adjustments in the final settlement calculations with the target being less than 6 adjustments per year.

Monitoring Results

There has been 1 adjustment in the Final Settlement Statements within the year due to the correction of metered quantities (MQ) of PENELCO and CENPRI, which affected the net settlement surplus (NSS) of all market participants during the 118th

billing period. As provided in Figure 22, this 1 adjustment for the year is well within the Excellent rating, maintaining the favorable rating for this measure since 2014.

Figure 22. Frequency of Adjustments in Final Settlement Calculations (YTD) in 2014 to 2016



3.5.4. Meter Data Error Detection

The MO is also evaluated in terms of its ability to detect meter data errors through the timely issuance of Meter Trouble Reports (MTRs) within 4 calendar days after receipt of meter data from the MSP.

The MO receives daily MQ electronically in Meter Data Exchange Format (MDEF – a software format) and monthly MQ via compact disc (CD) in Excel format from the MSP. The daily MQ is used for daily monitoring, processing and validation while the formatted-excel MQ is used for monthly settlement in the WESM. In cases where there exists orphan²⁴ meter data and meter data with uncertain and missing values²⁵, the MO will issue an MTR to the MSP. In turn, the MSP should issue the corrected daily meter data within 10 calendar days and monthly meter data within 2 business days.²⁶

Monitoring Results

Timeliness of the issuance of MTRs rated 100%, or Excellent, for the year and since 2014. While this is the case, there is a need to implement enhancements to the quality of metering data being received by the MO in consideration of the significant volume of MTRs and responsibility of the MSPs to provide accurate MQs. Table 21

²⁴ Values of the metered data whose meter is not registered in the MMS master lists are known as the “Orphan Values” (Section 7.3.2.3 of the WESM Manual on Metering Standards and Procedures).

²⁵ Section 7.3.4 of the WESM Manual on Metering Standards and Procedures

²⁶ Section 10.4.1.3-4 of the WESM Manual on Metering Standards and Procedures

provides the number of monthly and daily MTRs issued in 2016 for WESM and RCOA meters.

Table 21. Number of Monthly and Daily MTRs issued in 2016 for WESM and RCOA

Monitoring Period	Level	Monthly MTRs	Daily MTRs
26Sep15 - 25Dec15	WESM	1,151	10,290
	RCOA	189	4,448
	Sub-Total	1,340	14,738
26Dec15 - 25Mar16	WESM	866	8,404
	RCOA	213	5,668
	Sub-Total	1,079	14,072
26Mar16 - 25Jun16	WESM	629	7,379
	RCOA	343	7,647
	Sub-Total	972	15,026
26Jun16 - 25Sep16	WESM	699	10,954
	RCOA	331	10,945
	Sub-Total	1,030	21,899
26Sep15 - 25Sep16	Total	4,421	65,735

3.5.5. Monetary Transactions and Remittance Efficiency

As provided in the MOPS and the WESM Billing and Settlements Manual, all monetary transactions must be remitted to WESM Members in accordance to the WESM settlement timetable, i.e. no later than 3:00 p.m. on the next business day following the day on which the MO is to be paid.

Monitoring Results

The MO has consistently rated Excellent in processing timely monetary transactions and ensuring that all payments received from buying Trading Participants are remitted to selling Trading Participants. To provide an indication on the amount of electricity traded in the WESM, the total amounts received and paid by the MO in 2016 are provided in Table 22.

Table 22. Amount of Monetary Transactions in the WESM in 2016

Monitoring Period	Amounts Received and Paid to Trading Participants (in PhP)
26Sep15 - 25Dec15	8,305,206,095.76
26Dec15 - 25Mar16	8,646,355,017.39
26Mar16 - 25Jun16	11,705,196,265.53
26Jun16 - 25Sep16	12,857,855,572.07
26Sep15 - 25Sep16	41,514,612,950.75

3.5.6. Timeliness of Margin Calls and Default Notices

In accordance with the WESM Rules, the MO should verify whether each market participant has sufficient levels of prudential support to cover their financial trading activity in the spot market. If the actual exposure of a Market Participant exceeds its trading limit, then the MO shall issue a "Margin Call" to the Market Participant. As provided in the MOPS, the MO shall be evaluated according to the timeliness of issuing a notice for margin call to relevant WESM Member.

The MO target of margin call issuance is on or before the 20th of the next month after the billing period, i.e. for the billing month 26 January 2016 to 25 February 2016, margin calls should have been issued on or before 20 March 2016.

With regards the issuance of default notices, WESM Rule 3.14.11.2 requires the MO to issue a default notice, which specifies the nature of the alleged default, as soon as practicable, during any of the default events specified under WESM Rule 3.14.11.1. Further, the MO is required to disclose information pursuant to DOE DC No. 2013-07-0018 issued on 26 July 2013, Section 1.1.(a) containing the Settlement amount unpaid by the end of the month, and the specific WESM member that failed to pay the settlement amounts.

Monitoring Results

The MO has consistently rated Excellent in providing timely margin calls and default notices to Trading Participants.²⁷ The list of WESM members with unpaid energy settlement amounts are published, as required, in the WESM website.

3.5.7. Recommendations

The revised market rules for the implementation of enhanced market design and operations, as well as the deployment of the CRSS, are recommended to be considered in the review of the MOPS for billing, settlements, and accounts management.

3.5.8. PEMC Action Plans

While the MO has achieved favorable ratings for this measure, the review and enhancement of the implementation of billing and settlement procedures are continuing activities to mitigate manual errors.

²⁷ Monitoring of timely default notices was implemented starting in 2015, under the current version of the MOPS.

3.6. Registration and Customer Relations

This category evaluates the MO in relation to its efficiency in addressing the concerns and requests of external parties, which may directly influence the perception of the market participants on PEMC as an organization, and WESM as a venue for trading electricity.

In summary, the ratings for the sub-categories under this major category are provided below.

Table 23. Registration and Customer Relations Performance Ratings for 4Q 2015 - 3Q 2016

Section	Sub-Category	Target	Actual	Score	Description
3.6.1	Timeliness of Processing Registration Applications	95%	96.67%	4	Very Satisfactory
3.6.2	Timeliness of Processing Customer Switching Applications	95%	100%	5	Excellent
3.6.3	Timeliness of the conduct of Participant Trainings	95%	100%	5	Excellent
	Participant's Feedback re: Training	90%	94.80%	4	Very Satisfactory
3.6.4	Timeliness in addressing Participant Queries and Data Requests	95%	100%	5	Excellent
3.6.5	Timeliness in addressing Participant/ Customer Complaints	95%	98.51%	4	Very Satisfactory

3.6.1. Registration Processing

The process of registration of the WESM participants under the WESM Rules is being implemented according to the following timeline:

- Within 5 working days from receiving an application, the MO shall advise the applicant of any further information which the MO reasonably considers to be required to properly assess the application (WESM Rules, Clause 2.5.3.1);
- The MO shall send written notice of approval to the applicant within 15 working days from receipt of the application or the additional information or fees, if any;
- The registration of the applicant shall take effect on the date specified in the notice of approval which shall be a date not more than 7 working days after the date on which the MO sends the notice of approval.

Monitoring Results

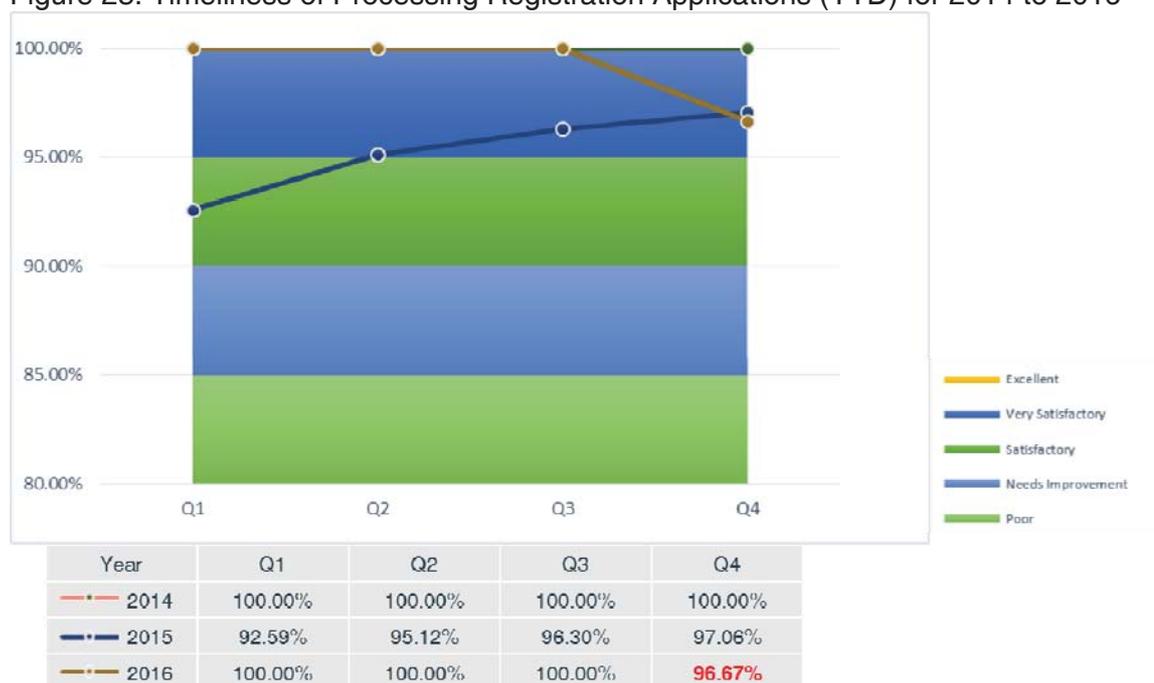
In consideration of the above timelines, the MO met the target timeliness rating in all quarters as provided in Table 24. The lower timeliness rating in 3Q 2016 (Q3) is attributed to the delayed processing of 4 out of 55 registration applications.

The annual timeliness rating for 2016 is at 96.67%, Very Satisfactory, as provided in Figure 23. This is corresponding to the timely processing of 116 registration applications out of 120 total applications for the year, which is 76% more than the 68 registration applications processed in 2015. The number of registration applications are expected to increase with the forthcoming implementation of a broader contestable market in 2017.

Table 24. Timeliness of Processing Registration Applications for 4Q 2015 - 3Q 2016

Monitoring Period	Performance				No. of Registration Applications Processed On Time
	Target	Actual	Score	Description	
26Sep15 - 25Dec15	95%	100%	5	Excellent	13 out of 13
26Dec15 - 25Mar16		100%	5	Excellent	39 out of 39
26Mar16 - 25Jun16		100%	5	Excellent	13 out of 13
26Jun16 - 25Sep16		92.73%	3	Satisfactory	51 out of 55

Figure 23. Timeliness of Processing Registration Applications (YTD) for 2014 to 2016



3.6.2. Customer Switching Requests

In accordance with the Retail Rules, customer switching requests should be processed by the MO, subject to the completion of all requirements, within 30 days prior to the proposed effective date.

Monitoring Results

The MO has consistently rated Excellent in processing timely requests for customer switching since 2015.²⁸ In 2016, the MO processes 22 customer switching requests, which is 83% more than the 12 requests processed in 2015.

²⁸ Customer switching timeliness was only measured starting in 2015, under the current MOPS.

3.6.3. Participants Feedback and Timeliness in the Conduct of Training

To gauge the effectiveness of trainings, their timely conduct and the participants' feedback on the trainer/speaker and other aspects of the training (e.g. logistics and materials), which are gathered through survey forms to rate, are monitored.

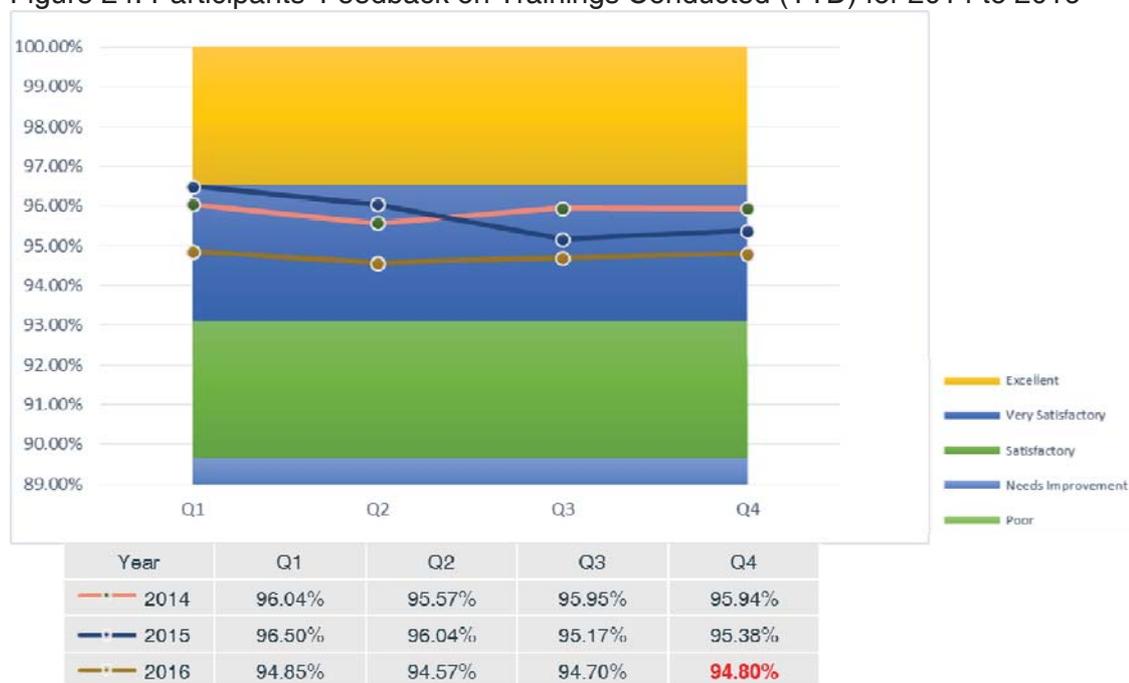
Monitoring Results

The MO has consistently rated Excellent in the timely conduct of trainings since 2014. On the other hand, participants have also consistently rated the MO as Very Satisfactory based on their feedback, as provided in Figure 24. Further, Table 25 provides the quarterly rating of the MO based on participants' feedback on the trainings conducted in 2016.

Table 25. Participants' Feedback on Trainings Conducted for 4Q 2015 - 3Q 2016

Monitoring Period	Feedback			
	Target	Actual	Score	Description
26Sep15 - 25Dec15	90%	94.85%	4	Very Satisfactory
26Dec15 - 25Mar16		94.29%	4	Very Satisfactory
26Mar16 - 25Jun16		94.96%	4	Very Satisfactory
26Jun16 - 25Sep16		95.08%	4	Very Satisfactory

Figure 24. Participants' Feedback on Trainings Conducted (YTD) for 2014 to 2016



3.6.4. Participant Queries and Data Requests

The MOPS requires the MO to address queries and data requests in a timely manner. Queries and data requests may include requests for historical data, clarifications regarding WESM concepts and requests for in-depth analysis or simulations.

Monitoring Results

The MO processed 201 queries/data requests in 2016, as required. Figure 25 presents that the MO has improved in this measure with the rating of 100% in 2016 from 99.05% and 99.02% in 2014 and 2015, respectively.

Figure 25. Timeliness of Processing Participant Queries and Data Requests (YTD) in 2014 to 2016



3.6.5. Participant/Customer Complaint

The MOPS provides that complaints by customers (WESM Members, DOE and ERC) should be resolved in a timely manner, i.e. within 5 working days.

The complaints received are mostly related to the MO's IT systems, particularly the MPI and public WESM website, which are the main interface of the MO with the market participants.

Monitoring Results

The MO addressed 66 out of 67 valid complaints in 2016 as required. Table 26 indicates that the 1 delayed processing, which is related to a Trading Participant not being able to access the MPI, occurred in 2Q 2016 (Q3). Figure 26 provides that this caused the slight decrease in rating from 100% in 2015 to 98.51% in 2016.

Table 26. Timeliness in addressing Valid Complaints for 4Q 2015 - 3Q 2016

Monitoring Period	Performance			
	Target	Actual	Score	Description
26Sep15 - 25Dec15	95%	100%	5	Excellent
26Dec15 - 25Mar16		100%	5	Excellent
26Mar16 - 25Jun16		95.83%	4	Very Satisfactory
26Jun16 - 25Sep16		100%	5	Excellent

Figure 26. Timeliness in addressing Valid Complaints (YTD) for 2014 to 2016



3.6.6. Recommendations: Registration and Customer Relations

The MO has met all performance targets in relation to providing customer service and participant support. To further improve its performance in this area, particularly in addressing and monitoring queries/data requests and complaints, the close coordination within the MO and implementation of automated monitoring systems are recommended to ensure timely resolution and also minimize duplication in monitoring.

3.6.7. PEMC Action Plans: Registration and Customer Relations

While the MO has achieved favorable ratings for this measure, the review and enhancement of the systems, processes and procedures related to registration and customer relations are continuing activities to mitigate delays.

4. Over-all MO Performance

The over-all performance of the MO in 2016 for the period 26 September 2015 to 25 September 2016 is Satisfactory, which is lower than the rating in 2015. The MO's performance rating in each performance category in 2016 and 2015 are summarized below.

Table 27. MO Performance for 4Q 2015 - 3Q 2016

Category	Measure	Weight (%)	Target	2015		2016		Y-O-Y (Score)	
				Actual	Score	Actual	Score		
G. IT Systems									
Market Management Systems	Availability	15	99.80%	99.88%	4	99.85%	3	Satisfactory	↓
WESM Website	Availability	5	99.50%	99.85%	5	99.87%	5	Excellent	■
H. Market Reports and Data Publication									
	Availability	5	95%	99.97%	4	99.99%	4	Very Satisfactory	■
	Timeliness	10	95%	96.77%	4	>95%	4	Very Satisfactory	■
I. Forecast Accuracy									
RTD Forecast - MAPE	Accuracy (L)	3.75	0.95%	0.79%	4	0.80%	4	Very Satisfactory	■
	Accuracy (V)	3.75	1.20%	1.16%	4	1.50%	2	Needs Improvement	↓
RTD Forecast - FAR	Accuracy (L)	3.75	97.20%	98.78%	5	98.64%	5	Excellent	↑
	Accuracy (V)	3.75	93.00%	95.03%	4	89.70%	2	Needs Improvement	↓
DAP Forecast - MAPE	Accuracy (L)	2.5	1.60%	1.39%	4	1.36%	4	Very Satisfactory	■
	Accuracy (V)	2.5	2.20%	2.18%	4	2.00%	4	Very Satisfactory	■
J. Dispatch Scheduling and Pricing									
RTD Workflow	Successful Run	2.5	99.75%	100%	5	100%	5	Excellent	■
RTX Workflow	Successful Run	2.5	99.75%	99.91%	4	100%	5	Excellent	↑
Pricing Errors and Market Re-runs	Timeliness (Prelim)	2	98.50%	99.98%	5	99.17%	4	Very Satisfactory	↓
	Timeliness (Final)	3	99.50%	100%	5	100%	5	Excellent	■
Market Intervention Attributable to MO	Duration	10	≤ 14	8	4	16	2	Needs Improvement	↓
K. Billing, Settlements and Accounts Management									
Preliminary and Final Settlement Statements	Timeliness	2	98%	99.79%	5	100%	5	Excellent	■
Preliminary Settlement Calculations	Accuracy	2	95%	93.64%	2	98.27%	4	Very Satisfactory	↑
Final Settlement Calculations	Accuracy	3	99%	97.62%	1	99.92%	5	Excellent	↑
	Frequency	2	≤ 6	2	5	1	5	Excellent	■
Meter Data Error Detection	Timeliness	2	98%	100%	5	100%	5	Excellent	■
Monetary Transactions	Efficiency	1	0 amount late	0 amount late	5	0 amount late	5	Excellent	■
	Timeliness	1	0 days late	0 days late	5	0 days late	5	Excellent	■
Margin Call	Timeliness	1	95%	100%	5	0 days late	5	Excellent	■
Default Notice	Timeliness	1	0 days late	0 days late	5	100%	5	Excellent	■
L. Registration and Customer Relations									
Registration	Timeliness	2	95%	97.06%	4	96.67%	4	Very Satisfactory	■
Customer Switching	Timeliness	1	95%	100%	5	100%	5	Excellent	■

Category	Measure	Weight (%)	Target	2015		2016			Y-O-Y (Score)
				Actual	Score	Actual	Score		
Participant Training	Timeliness	2	95%	100%	5	100%	5	Excellent	■
	Feedback	1	90%	95.49%	4	94.80%	4	Very Satisfactory	■
Participant Queries and Data Requests	Timeliness	2	95%	99.02%	5	100%	5	Excellent	■
Participant/ Customer Complaints	Timeliness	2	95%	100%	5	98.51%	4	Very Satisfactory	▼
Over-All Score					4			3	▼

Appendix A. Rating System References²⁹

MO Performance Category	Measure	Rating System	Target	Ranges				
				Excellent 5	Very Satisfactory 4	Satisfactory 3	Needs Improvement 2	Poor 1
IT Systems (20%)								
Market Management Systems	Availability	RS 2a	99.80%	$99.93\% \leq x \leq 100\%$	$99.87\% \leq x < 99.93\%$	$99.80\% \leq x < 99.87\%$	$99.80\% > x \geq 99.73\%$	$99.73\% > x$
WESM Website	Availability	RS 2a	99.50%	$99.83\% \leq x \leq 100\%$	$99.67\% \leq x < 99.83\%$	$99.50\% \leq x < 99.67\%$	$99.50\% > x \geq 99.33\%$	$99.33\% > x$
Market Reports and Data Publication (15%)	Availability	RS 3	95%	=100%	$95\% \leq x < 100\%$	$90\% \leq x < 95\%$	$85\% \leq x < 90\%$	$x < 85\%$
	Timeliness	RS 3	95%	=100%	$95\% \leq x < 100\%$	$90\% \leq x < 95\%$	$85\% \leq x < 90\%$	$x < 85\%$
Forecast Accuracy (20%)								
RTD Forecast - MAPE	Accuracy - Luzon	RS 4b	0.95%	$x \leq 0.68\%$	$0.68\% < x < 0.92\%$	$0.92\% \leq x \leq 0.98\%$	$0.98\% < x < 1.28\%$	$x \geq 1.28\%$
	Accuracy - Visayas		1.20%	$x \leq 0.86\%$	$0.86\% < x < 1.17\%$	$1.17\% \leq x \leq 1.23\%$	$1.23\% < x < 1.65\%$	$x \geq 1.65\%$
RTD Forecast - FAR	Accuracy - Luzon	RS 2b	97.20%	$x \geq 98.55\%$	$98.55\% > x > 97.65\%$	$97.65\% \geq x \geq 96.75\%$	$96.75\% > x > 95.85\%$	$x \leq 95.85\%$
	Accuracy - Visayas		93.00%	$x \geq 97.00\%$	$97.00\% > x > 94.33\%$	$94.33\% \geq x \geq 91.67\%$	$91.67\% > x > 89.00\%$	$x \leq 89.00\%$
DAP Forecast - MAPE	Accuracy - Luzon	RS 4C	1.60%	$x < 1.11$	$1.11\% < x < 1.45\%$	$1.45\% < x < 2.32\%$	$2.32\% < x < 3.20\%$	$x > 3.20\%$
	Accuracy - Visayas		2.20%	$x < 1.73$	$1.73\% < x < 2.41\%$	$2.41\% < x < 3.08\%$	$3.08\% < x < 3.27\%$	$x > 3.27\%$
Dispatch Scheduling and Pricing (20%)								
RTD Workflow	Successful Run	RS 2a	99.75%	$99.92\% \leq x \leq 100\%$	$99.83\% \leq x < 99.92\%$	$99.75\% \leq x < 99.83\%$	$99.75\% > x \geq 99.67\%$	$99.67\% > x$
RTX Workflow	Successful Run	RS 2a	99.75%	$99.92\% \leq x \leq 100\%$	$99.83\% \leq x < 99.92\%$	$99.75\% \leq x < 99.83\%$	$99.75\% > x \geq 99.67\%$	$99.67\% > x$
Pricing Errors and Market Re-runs	Timeliness - Prelim	RS 2a	98.50%	$99.50\% < x < 100\%$	$99.50\% < x < 99.00\%$	$98.50\% < x < 99.00\%$	$98.50\% < x < 98.00\%$	$98.00\% > x$
	Timeliness - Final	RS 2a	99.50%	$99.83\% \leq x \leq 100\%$	$99.67\% \leq x < 99.83\%$	$99.50\% \leq x < 99.67\%$	$99.50\% > x \geq 99.33\%$	$99.33\% > x$
Market Intervention Attributable to MO	Duration	RS 4a	14	$5 \geq x \geq 0$	$9 \geq x > 5$	$14 \geq x > 9$	$14 < x \leq 19$	$19 < x$

²⁹ Refer to the MO Performance Standards Scoring System, Section 9, PEMC-MOPS, 2015

MO Performance Category	Measure	Rating System	Target	Ranges				
				Excellent 5	Very Satisfactory 4	Satisfactory 3	Needs Improvement 2	Poor 1
Billings, Settlements and Accounts Management (15%)								
Preliminary and Final Settlement Statements	Timeliness	RS 2a	98%	$99.33\% \leq x \leq 100\%$	$98.67\% \leq x < 99.33\%$	$98\% \leq x < 98.67\%$	$98\% > x \geq 97.33\%$	$97.33\% > x$
Preliminary Settlement Calculations	Accuracy	RS 2a	95%	$98.33\% \leq x \leq 100\%$	$96.67\% \leq x < 98.33\%$	$95\% \leq x < 96.67\%$	$95\% > x \geq 93.33\%$	$93.33\% > x$
Final Settlement Calculations	Accuracy	RS 2a	99%	$99.67\% \leq x \leq 100\%$	$99.33\% \leq x < 99.67\%$	$99\% \leq x < 99.33\%$	$99\% > x \geq 98.67\%$	$98.67\% > x$
	Frequency	RS 4a	≤ 6	$2 \geq x \geq 0$	$4 \geq x > 2$	$6 \geq x > 4$	$6 < x \leq 8$	$8 < x$
Meter Data Error Detection	Timeliness	RS 2a	98%	$99.33\% \leq x \leq 100\%$	$98.67\% \leq x < 99.33\%$	$98\% \leq x < 98.67\%$	$98\% > x \geq 97.33\%$	$97.33\% > x$
Monetary Transactions	Remittance Efficiency	RS 1	0 amount late	$x=0$				$x>0$
	Timeliness	RS 1a	0 days late	$x=0$				$x>0$
Margin Call	Timeliness	RS 2a	95%	$98.33\% \leq x \leq 100\%$	$96.67\% \leq x < 98.33\%$	$95\% \leq x < 96.67\%$	$95\% > x \geq 93.33\%$	$93.33\% > x$
Default Notice	Timeliness	RS 1	0 days late	$x=0$				$x>0$
Registration and Customer Relations (10%)								
Registration	Timeliness	RS 3	95%	$x= 100\%$	$95\% \leq x < 100\%$	$90\% \leq x < 95\%$	$85\% \leq x < 90\%$	$x < 85\%$
Customer Switching	Timeliness	RS 3	95%	$x= 100\%$	$95\% \leq x < 100\%$	$90\% \leq x < 95\%$	$85\% \leq x < 90\%$	$x < 85\%$
Participant Training	Timeliness	RS 3	95%	$x= 100\%$	$95\% \leq x < 100\%$	$90\% \leq x < 95\%$	$85\% \leq x < 90\%$	$x < 85\%$
	Feedback	RS 2a	90%	$96.67\% \leq x \leq 100\%$	$93.33\% \leq x < 96.67\%$	$90\% \leq x < 93.33\%$	$90\% > x \geq 86.67\%$	$86.67\% > x$
Participant Queries and Data Requests	Timeliness	RS 2a	95%	$98.33\% \leq x \leq 100\%$	$96.67\% \leq x < 98.33\%$	$95\% \leq x < 96.67\%$	$95\% > x \geq 93.33\%$	$93.33\% > x$
Participant/ Customer Complaints	Timeliness	RS 3	95%	$x= 100\%$	$95\% \leq x < 100\%$	$90\% \leq x < 95\%$	$85\% \leq x < 90\%$	$x < 85\%$