



## RULES CHANGE COMMITTEE

### Proposed Amendments to WESM Rules and Various WESM Manuals on Implementation of Reserve Market

Effective Date : 22 November 2021

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**WHEREAS**, Clause 3.3.3.2 of the WESM Rules requires the System Operator to provide adequate ancillary services for each region by entering into contracts with Ancillary Services Provider and/or competitive spot market trading;

**WHEREAS**, the Department of Energy (DOE) on 23 October 2015 adopted enhancements to WESM design and operations which includes among others the change from a 1-hour dispatch interval to a 5-minute dispatch interval and implementation of the co-optimization of energy and reserves;

**WHEREAS**, the DOE issued a general policy framework governing the provision and utilization of ancillary services in the grid under DOE Department Circular DC2019-12-0018 dated 04 December 2019, which provided the criteria for the commercial operation of the WESM reserve market, among others;

**WHEREAS**, on 29 December 2020, the Energy Regulatory Commission (ERC) promulgated its Decision on the application filed by the Philippine Electricity Market Corporation (PEMC) on the DOE-approved<sup>1</sup> Price Determination Methodology (PDM) containing provisions on reserve pricing and settlement for the enhanced WESM design and operations<sup>2</sup>. In said Decision, the ERC ordered that reserve related features of the PDM shall be subject to the DOE's pending policy issuance on ancillary services, which deferred the provisions on reserve pricing and settlement;

**WHEREAS**, on 13 May 2021, the DOE issued a policy framework for the operationalization of the Reserve Market and tasked IEMOP to submit rules changes for its implementation under DOE Department Circular DC2021-03-0009 dated 27 March 2021, which supplemented the earlier DOE policy and provided the features of the reserve market;

**WHEREAS**, on 06 September 2021, the Independent Electricity Market Operator of the Philippines (IEMOP) submitted proposed general amendments to comply with the policy of the DOE with regards to the implementation of the Reserve Market, with part of the proposal reverting to the reserve pricing and settlement provisions that were previously approved by the DOE. The summary of the proposal is as follows:

Document	Proposed Changes
1. WESM Rules	<ul style="list-style-type: none"> <li>Align definition of reserve categories with DOE DC2021-03-0009</li> <li>Specify information required for registration of Ancillary Service Providers</li> <li>Inclusion of reserve settlement quantities and amounts</li> <li>Removal of spot reserve recovery charges from Trading Participants' settlement amounts</li> <li>Designation of the System Operator as single buyer for reserves</li> </ul>
2. WESM Manual on Price Determination	<ul style="list-style-type: none"> <li>Definition of Luzon, Visayas and Mindanao as reserve regions</li> <li>Automatic pricing rerun parameters including reserve prices</li> </ul>

<sup>1</sup> DOE DC 2017-03-0001 dated 20 March 2017

<sup>2</sup> ERC Case No. 2017-042 RC

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Document	Proposed Changes
Methodology, Issue 3.0	<ul style="list-style-type: none"> <li>• Application of Price Substitution Methodology to reserve prices</li> <li>• Reserve Administered Prices</li> <li>• Definition of reserve quantities and trading amounts</li> <li>• Inclusion of reserve trading amounts in the aggregate trading amounts</li> <li>• Removal of spot reserve recovery charges from Trading Participants' settlement amounts</li> <li>• Designation of the System Operator as single buyer for reserve settlement amounts</li> <li>• Inclusion of details on optimization constraints related to scheduling of simultaneous reserve categories</li> </ul>
3. WESM Manual on Registration, Suspension and De-registration Criteria and Procedures, Issue 10.0	<ul style="list-style-type: none"> <li>• Designation of the System Operator as Customer Trading Participant with respect to purchase of reserves</li> <li>• Specify information required for registration of Ancillary Service Providers including reserve categories and maximum reserve capability</li> </ul>
4. WESM Manual on Billing and Settlement, Issue 8.0	<ul style="list-style-type: none"> <li>• Removal of spot reserve recovery charges from Trading Participants' settlement amounts</li> <li>• Designation of the System Operator as single buyer for reserve settlement amounts</li> <li>• Issuance of separate settlement statements for reserves</li> <li>• Amendment to computation of projected settlement amount to consider reserve transactions by the System Operator</li> </ul>
5. WESM Manual on Dispatch Protocol, Issue 16.0	<ul style="list-style-type: none"> <li>• General revisions on how reserves are scheduled</li> <li>• Changes on the Submission of Reserve Offers to include Modes of Operation</li> <li>• Additional provisions on the scheduling and dispatch of reserves</li> <li>• Inclusion of reserve effectiveness factors for monitoring as reserve conformance standards</li> </ul>

**WHEREAS**, the RCC initially took up the proposal during its 184<sup>th</sup> Regular Meeting last 17 September 2021, and approved the same for publication to solicit comments from the stakeholders;

**WHEREAS**, following the 30-working day commenting period from 22 September 2021 to 04 November 2021, comments were received from the following parties:

1. Philippine Electricity Market Corporation (PEMC);
2. Technical Committee (TC);
3. SN Aboitiz Power (SNAP);
4. Aboitiz Power Corporation (APC);
5. Manila Electric Company (MERALCO);
6. SPC Power Corporation/SPC Island Power Corporation (SIPC/SPC);
7. AC Energy;
8. National Grid Corporation of the Philippines (NGCP); and
9. Millennium Energy Inc./Panasia Energy Inc (MEI/PEI);<sup>3</sup>

<sup>3</sup> Comments received beyond the commenting period are from: 1) NGCP on 10 & 17 November 2021, and 2) MEI/PEM on 05 November 2021

**WHEREAS**, in a letter dated 08 November 2021, PEMC requested the RCC to discuss and finalize the proposed rules and manuals changes for the implementation of the reserve market in time for the November 2021 PEM Board meeting. PEMC cited that one of the DOE's priority programs in the remainder of the current administration is to fast-track the implementation of the reserve market.

**WHEREAS**, during its 187<sup>th</sup> Regular Meeting on 19 November 2021, the RCC deliberated on the proposal, giving due consideration to the comments received, including those submitted beyond the commenting period, and the corresponding responses by the proponent. The RCC then decided to:

- Adopt the proposed changes that are aligned with the DOE policy on NGCP being the single buyer in the reserve market. The RCC noted NGCP's interpretation that the mandate of SO, based on the DOE Circular, is just to collect the payments made by the electric power industry participants and to remit the same to IEMOP, i.e. NGCP as a collection agent, and the responsibilities under Clause 5.3.1 of the WESM Manual on Billing and Settlement are not applicable to a collection agent;
- Adopt the proposed changes that are aligned with the DOE policy that ancillary service providers may be scheduled to provide multiple reserve categories as long as they are certified by the SO and it is technically feasible to implement;

The RCC noted NGCP's general comments on the single-buyer system, such as their concerns on the benefit added to the market participants, the possibility of this system to reduce overall costs or result in pancaking of charges, and their compliance to prudential requirements. In consideration of the corresponding consultations leading to the DOE's policy issuance on the matter, the RCC deemed it prudent to comply with the DOE's policy and that NGCP's 1) policy concerns be addressed by the DOE, and 2) compliances on prudential requirement and payment of reserve spot transactions be addressed by the ERC in its final approval of the revised PDM;

- Adopt IEMOP's proposal for SO to monitor the compliance to the reserve effectiveness factor (REF) by ancillary services providers. The RCC noted NGCP's proposal to replace REF with the NGCP's Penalty System and IEMOP's response that the proposed REF was originally approved by the DOE,<sup>1</sup> notwithstanding Section 11.3 of the abovementioned DOE Department Circular DC2021-03-0009 that the Governance Arm shall monitor compliance and conformation of ancillary services providers with the schedule and dispatch instruction for energy and reserves issued by the MO and SO, respectively, and submit a monthly report on the same to the DOE and ERC;

**WHEREAS**, the RCC also noted that IEMOP shall raise to the DOE during its public consultation and ERC during its expository hearings the matter on the computation for the reserve administered price in the absence of reserve prices and quantities in case market intervention occurs during the first week of commercial operation of the reserve market;

**WHEREAS**, the RCC provisionally approved the proposal subject to 1) further changes in the PDM by the proponent on provisions on Price Substitution Methodology for Reserve Prices under Section 6.5 and addition of illustrative example on co-optimization as requested by the commenters, and 2) confirmation by PEMC whether it will require a copy of the SO's compliance monitoring report under Section 15.3.1 of the WESM Manual on Dispatch Protocol;

**WHEREAS**, on 22 November 2021, the RCC, having received inputs from PEMC on 19 November 2021 that it will not require copy of the compliance monitoring report at this time pending the development of

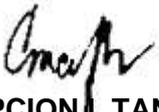
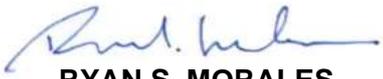
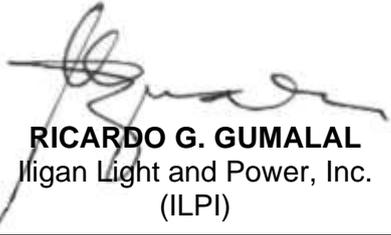
the penalty mechanism for the reserve market and if SO will be the one responsible to monitor compliance of ancillary service providers, and from the proponent on the evening of 20 November 2021, approved the proposal, as revised, and its endorsement to the PEM Board.

**NOW THEREFORE**, we, the undersigned, on behalf of the sectors we represent, hereby resolve via electronic communication platforms, as follows:

**RESOLVED**, that RCC approved the Proposed Amendments to WESM Rules and Various WESM Manuals on Implementation of Reserve Market attached as Annex A;

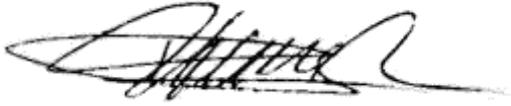
**RESOLVED FURTHER**, that the said Proposed Amendments to the Proposed Amendments to WESM Rules and Various WESM Manuals on Implementation of Reserve Market, are hereby endorsed to the PEM Board for approval and for submission to DOE for consideration.

Done this **22<sup>nd</sup>** day of **November 2021**, *via* Microsoft Teams.

<p>Approved by:  <b>THE RULES CHANGE COMMITTEE</b></p>	
<p>Independent Members:</p>	
 <b>ALLAN C. NERVES</b> Chairperson	 <b>CONCEPCION J. TANGLAO</b>
 <b>JESUSITO G. MORALLOS</b>	<p>(vacant)</p>
<p>Generation Sector Members:</p>	
 <b>DIXIE ANTHONY R. BANZON</b> Masinloc Power Partners Co. Ltd. (MPPCL)	 <b>CHERRY A. JAVIER</b> Aboitiz Power Corp. (APC)
 <b>CARLITO C. CLAUDIO</b> Millennium Energy, Inc./ Pansia Energy, Inc. (MEI/PEI)	 <b>MARK D. HABANA</b> Vivant Corporation - Philippines (Vivant)
<p>Distribution Sector Members:</p>	
 <b>VIRGILIO C. FORTICH, JR.</b> Cebu III Electric Cooperative, Inc. (CEBECO III)	 <b>RYAN S. MORALES</b> Manila Electric Company (MERALCO)
 <b>RICARDO G. GUMALAL</b> Iligan Light and Power, Inc. (ILPI)	 <b>NELSON M. DELA CRUZ</b> Nueva Ecija II Area 1 Electric Cooperative, Inc. (NEECO II – Area 1)



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Supply Sector Member:
 <b>LORRETO H. RIVERA</b> TeaM (Philippines) Energy Corporation (TPEC)
Market Operator Member:
 <b>ISIDRO E. CACHO, JR.</b> Independent Electricity Market Operator of the Philippines (IEMOP)
System Operator Member:
 <b>AMBROCIO R. ROSALES</b> National Grid Corporation of the Philippines (NGCP)



A. WESM RULES				
Title	Clause	Provision	Proposed Amendment	Rationale
Responsibilities of the System Operator	1.3.4	<p>1.3.4 Responsibilities of the System Operator Under these Rules, the System Operator shall have the following functions and responsibilities:</p> <p>xxx</p> <p>(c) Contribute towards the development of procedures, processes or systems, or to assist with any aspect of the operation of the spot market, in coordination with the Market Operator.</p> <p>(d) Implement the transitory provisions specified in Chapter 10; and</p> <p>(e) Perform those actions that are required to be taken prior to the spot market commencement date as specified in the WESM Rules and clause 10.4.</p>	<p>1.3.4 Responsibilities of the System Operator Under these Rules, the System Operator shall have the following functions and responsibilities:</p> <p>xxx</p> <p><b><u>(c) Procure reserves through the Ancillary Service Procurement Agreement and WESM for the settlement of such transactions pursuant to prevailing rules, regulations and issuances promulgated by the DOE or the ERC.</u></b></p> <p><b>(d)</b><del>(e)</del> Contribute towards the development of procedures, processes or systems, or to assist with any aspect of the operation of the spot market, in coordination with the Market Operator.</p> <p><b>(e)</b><del>(d)</del> Implement the transitory provisions specified in Chapter 10; and</p> <p><b>(f)</b><del>(e)</del> Perform those actions that are required to be taken prior to the spot market commencement date as specified in the WESM Rules and clause 10.4.</p>	<p>Added the provision to designate SO as the single buyer of reserves in the WESM pursuant to Clause 3.5 of DOE DC2021-03-0009</p> <p>Clerical revisions to update numbering</p>
Registration – Ancillary Services Provider	2.3.5.1	<p>2.3.5.1 A Trading Participant or Network Service Provider providing ancillary services in accordance with clause 3.3:</p> <p>(a) Shall register with the Market Operator as an Ancillary Services Providers respect of:</p> <p>(1) Each reserve facility it operates;</p> <p>(2) xxx</p>	<p>2.3.5.1 A Trading Participant or Network Service Provider providing ancillary services in accordance with clause 3.3:</p> <p>(a) Shall register with the Market Operator as an Ancillary Services Providers respect of:</p> <p>(1) Each reserve facility it operates;</p> <p>(2) xxx</p>	<p>Revised to allow registration in multiple categories per reserve facility in line with Clause 3.1.1.3 of DOE DC2021-03-0009</p> <p><i>Note:</i> Reserve providers may provide AS for multiple reserve</p>

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Title	Clause	Provision	Proposed Amendment	Rationale
		(3) The reserve facility category applicable to the reserves intended to be provided by each of the reserve facilities registered under clause 2.3.5.1 (a) (1) and as authorized by the System operator under clause 2.3.5.3.	(3) The reserve facility category <u>ies</u> applicable to the reserves intended to be provided by each of the reserve facilities registered under clause 2.3.5.1 (a) (1) and as authorized by the System operator under clause 2.3.5.3.	categories if they are certified by the SO <b>and it is technically feasible to implement</b> , as per Section 3.1.1.3 of DOE DC 2021-03-0009
Registration – Ancillary Services Provider	2.3.5.3	2.3.5.3 Prior to the registration of a Trading Participant or a Network Services Provider as an Ancillary Services Provider eligible to provide reserves in accordance with clause 2.3.5.1, the System operator shall:  (a) Certify that the relevant reserve facility is capable of providing the reserve category for which registration is sought, in accordance with the Grid Code and Distribution Code; xxx	2.3.5.3 Prior to the registration of a Trading Participant or a Network Services Provider as an Ancillary Services Provider eligible to provide reserves in accordance with clause 2.3.5.1, the System operator shall:  (a) Certify that the relevant reserve facility is capable of providing the reserve category <u>ies individually and/or simultaneously</u> for which registration is sought, in accordance with the Grid Code and Distribution Code; xxx	Revised to allow registration in multiple categories per reserve facility in line with Clause 3.1.1.3 of DOE DC2021-03-0009  <i>Note:</i> The reserve facility must be tested and certified by the System Operator if it is technically capable of simultaneously providing multiple reserve services.
Registration – Ancillary Services Provider	2.3.5.5	2.3.5.5 Ancillary Services Providers shall comply with the dispatch conformance standards developed pursuant to Clause 3.8.5.	2.3.5.5 Ancillary Services Providers shall comply with the dispatch conformance standards developed pursuant to Clause 3.8.5 <b><u>and the reserve conformance standards developed pursuant to Clause 3.8.7.</u></b>	Revised to specify requirement for AS Providers to comply with reserve conformance standards.

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				Development of reserve conformance standards is included in Clause 10.3 of DC2021-03-0009. Details of the standards are incorporated in the revisions to the Dispatch Protocol Manual.
Reserve Categories	3.3.4.2	<p>3.3.4.2 The <i>reserve</i> categories to be traded in the <i>spot market</i> shall include:</p> <p>(a) <i>Regulating reserve</i>, being the ability to respond to small fluctuations in system frequency including but not limited to fluctuations caused by load fluctuations;</p> <p>(b) <i>Contingency reserve</i>, being the ability to respond to a significant decrease in system frequency including but not limited to a decrease in system frequency in an interconnected AC network as a result of a credible contingency affecting one (or more) <i>Generation Companies</i> within that <i>network</i>, or <i>transmission</i> flows into that <i>network</i>; and</p>	<p>3.3.4.2 The <i>reserve</i> categories to be traded in the <i>spot market</i> shall include:</p> <p>(a) <i>Regulating reserve</i>, <b><u>readily available and dispatchable generating capacity that is allocated exclusively to correct deviations from the acceptable nominal frequency caused by unpredicted variations in demand or generation output;</u></b> <del>being the ability to respond to small fluctuations in system frequency including but not limited to fluctuations caused by load fluctuations;</del></p> <p>(b) <i>Contingency reserve</i>, <b><u>synchronized generation capacity from Qualified Generating Units and Qualified Interruptible Loads allocated to cover the loss or failure of a synchronized generating unit or a transmission element or the power import from a circuit interconnection;</u></b> <del>being the ability to respond to a significant decrease in system frequency including but not limited to a decrease in system frequency in an interconnected AC network as a result of a credible contingency</del></p>	Updated the definitions to be consistent with DOE DC 2021-03-0009 Section 4.1.

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		(c) Such other <i>reserve</i> categories as may from time to time be proposed by the <i>Market Operator</i> , in consultation with the <i>System operator</i> , and with <i>WESM members</i> , and approved by the <i>PEM Board</i> .	<p><del>affecting one (or more) <i>Generation Companies</i> within that <i>network</i>, or <i>transmission</i> flows into that <i>network</i>;</del></p> <p><b>(c) <u>Dispatchable Reserves, generating capacity that are readily available for dispatch in order to replenish the Contingency Reserves whenever a generating unit trips or a loss of a single transmission interconnection occurs;</u></b> and</p> <p><del>(e) (d) Such other <i>reserve</i> categories as may, from time to time, be proposed by the <i>Market Operator</i>, in consultation with the <i>System operator</i>, and with <i>WESM members</i>, and approved by the <i>PEM Board</i>.</del> <b><u>and subsequently ratified or prescribed by the DOE or the ERC.</u></b></p>	To clarify in letter (d) that the DOE or ERC retains the final ratification of the proposal of the Market Operator, in consultation with the industry stakeholders.
Ancillary Services Cost Recovery	3.3.5.2	3.3.5.2 The costs of <i>reserves</i> are to be recovered through the <i>settlement amounts</i> calculated by the <i>Market Operator</i> under clause 3.13.8 in accordance with the cost recovery formula to be developed by the <i>Market Operator</i> for each <i>reserve category</i> .	3.3.5.2 The costs of <i>reserves</i> are to be recovered <b><u>from the System Operator</u></b> through the <i>settlement <u>reserve trading</u> amounts</i> calculated by the <i>Market Operator</i> under clause 3.13.8 in accordance with the cost recovery formula <b><u>under clause 3.13.9</u></b> to be developed by the <i>Market Operator</i> for each <i>reserve category</i> .	<p>Updated as prescribed by the single buyer system as prescribed in DOE DC 2021-03-0009 Section 1.4.</p> <p>Deleted the last part as the general mechanism for calculating the reserve recovery costs are already included in this proposal</p>
Ancillary Services	3.3.5.3	3.3.5.3 The costs of providing each locationally specific reserve requirement shall be allocated by the <i>Market</i>	<del>3.3.5.3 The costs of providing each locationally specific reserve requirement shall be allocated by the <i>Market</i></del>	Deleted as prescribed by the

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Title	Clause	Provision	Proposed Amendment	Rationale
Cost Recovery		<i>Operator to those Trading Participants in the relevant reserve cost recovery zone in the form of reserve cost recovery charges to be determined in accordance with the principles set out in clause 3.3.5.4.</i>	<del><i>Operator to those Trading Participants in the relevant reserve cost recovery zone in the form of reserve cost recovery charges to be determined in accordance with the principles set out in clause 3.3.5.4.</i></del>	single buyer system as prescribed in DOE DC 2021-03-0009 Section 1.4.
Ancillary Services Cost Recovery	3.3.5.4	3.3.5.4 When allocating <i>reserve cost recovery charges to Trading Participants</i> in a particular <i>reserve cost recovery zone as published</i> in Clause 3.3.5.1 the <i>Market Operator</i> may recover the cost of reserves from <i>Trading Participants and Network Service Providers</i> .	<del>3.3.5.4 When allocating <i>reserve cost recovery charges to Trading Participants</i> in a particular <i>reserve cost recovery zone as published</i> in Clause 3.3.5.1 the <i>Market Operator</i> may recover the cost of reserves from <i>Trading Participants and Network Service Providers</i>.</del>	Deleted as prescribed by the single buyer system as prescribed in DOE DC 2021-03-0009 Section 1.4.
Approval, Periodic Review and Evaluation of Reserve Market Arrangements	3.3.7.3	3.3.7.3 Any proposed changes to the <i>ancillary service categories, ancillary services arrangements, ancillary services cost recovery formula, reserve categories, reserve regions</i> or locationally specific <i>reserve requirements</i> that will affect the fees of <i>ancillary services</i> shall be filed by the <i>System operator</i> of <i>TRANSCO</i> with the <i>ERC</i> for approval.	3.3.7.3 Any proposed changes to the <i>ancillary service categories, ancillary services arrangements, ancillary services cost recovery formula, reserve categories, reserve regions</i> or locationally specific <i>reserve requirements</i> that will affect the fees of <i>ancillary services</i> shall be filed by the <i>System operator</i> of <del><i>TRANSCO</i></del> with the <i>ERC</i> for approval.	Clerical revisions
Approval, Periodic Review and Evaluation of Reserve Market Arrangements	3.3.7.4	3.3.7.4 The <i>System operator</i> shall continuously adjust the reserve effectiveness factors for each <i>reserve facility category</i> , and the quantum of <i>reserve</i> to be scheduled to meet each locationally specific <i>reserve requirement</i> by the <i>market dispatch optimization model</i> , so as to accurately reflect the <i>power system</i> under existing or future conditions, within the relevant <i>market time frames</i> , as advised by the <i>System operator</i> under clause 3.5.3.1.	3.3.7.4 The <i>System operator</i> shall continuously adjust <b>update</b> the reserve effectiveness factors for each <i>reserve facility category</i> , and the quantum of <i>reserve</i> to be scheduled to meet each locationally specific <i>reserve requirement</i> by the <i>market dispatch optimization model</i> , so as to accurately reflect the <i>power system</i> under existing or future conditions, within the relevant <i>market time frames</i> , as advised by the <i>System operator</i> under clause 3.5.3.1.	Clerical revisions
Customer Reserve Offers	3.5.8.1	This section shall apply only upon commencement of the <i>spot market</i> for <i>ancillary services</i> established under clause 3.3.4 with the <i>ancillary service</i> certification by	This section shall apply only upon commencement of the <i>spot market</i> for <del><i>ancillary services</i></del> <b>reserves</b> established under clause 3.3.4 with the <i>ancillary</i>	Revised to harmonize with Clause 5.3 of

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		the <i>System Operator</i> and upon approval of <i>ERC</i> for other types of ancillary <i>reserves</i> .	<i>service</i> certification by the <i>System Operator</i> <b><u>or any qualified third party</u></b> and upon <b><u>promulgation of accreditation guidelines by ERC.</u></b>	DOE DC2021-03-0009 on qualification of load facilities as reserve providers.  <i>Note:</i> (a) This provision is envisioned to cover all load facilities, not only the loads under the ILP. ILP is a different service from that being provided by ancillary services.  (b) To fully operationalize this, a policy on demand-side bidding should also be in place.  (c) There is a need for ERC to issue certification guidelines for load facilities that wishes to provide ancillary services.
			<b><u>3.8.7 Reserve Conformance Standards</u></b>	To provide guidelines to the Market Operator, the System
		(new)	<b><u>3.8.7.1 The Market Operator shall develop reserve conformance standards to be set forth in the</u></b>	

A. WESM RULES				
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			<b><u>relevant <i>Market Manual</i> which shall be consistent with the <i>Grid Code</i> and <i>Distribution Code</i>.</u></b>	<p>Operator and the Ancillary Service Providers for the monitoring of compliance with the reserve schedules</p> <p>These provisions are similar with those on Dispatch Conformance Standards under Section 3.8.5 of the WESM Rules. Similarly, the development and revisions of the reserve conformance standards are intended to undergo the rules change process.</p>
	(new)		<b><u>3.8.7.2 The <i>Market Manual</i> under Clause 3.8.7.1 shall set out the following:</u></b> <b><u>(a) reserve conformance standards that will apply to <i>Ancillary Service Providers</i>;</u></b> <b><u>(b) procedures for monitoring and notifying <i>Ancillary Service Providers</i> of the non-compliance by their generating units or interruptible load facilities with their reserve schedules; and</u></b> <b><u>(c) Procedures for identifying and checking non-conformance with the reserve conformance standards taking into consideration any emergency directions issued to dispatched <i>Ancillary Service Providers</i>.</u></b>	
	(new)		<b><u>3.8.7.3 The <i>Market Operator</i> shall implement the procedures in Clauses 3.8.7.1 and 3.8.7.2 through a system to automatically check for non-conformance.</u></b>	
	(new)		<b><u>3.8.7.4 The <i>Market Operator</i>, in consultation with the <i>System Operator</i> and the <i>Trading Participants</i>, shall periodically review the reserve conformance standards and the procedures set out in Clause 3.8.7.1 and 3.8.7.2.</u></b>	
	(new)		<b><u>3.8.7.5 The <i>Market Operator</i> shall publish the <i>Market Manual</i> setting out the reserve conformance standards.</u></b>	

A. WESM RULES				
Title	Clause	Provision	Proposed Amendment	Rationale
Determination of Reserve Price	3.10.6	3.10.6 Determination Reserve Price (a) When applicable, the <i>reserve price</i> for a <i>reserve category</i> in a particular <i>reserve zone</i> for each <i>dispatch interval</i> shall be determined as the <i>shadow price</i> on the relevant <i>reserve requirement constraint</i> , defined in accordance with Clause 3.6.1.4 (e), in the <i>dispatch optimization</i> for that <i>dispatch interval</i> and <i>published</i> by the <i>Market Operator</i> before the start of that <i>dispatch interval</i> . (b) When applicable, the <i>reserve settlement price</i> for each <i>reserve zone</i> and <i>reserve category</i> in each <i>settlement interval</i> shall be determined as the schedule-weighted average of the corresponding <i>reserve prices</i> for that <i>reserve category</i> .	3.10.6 Determination <u>of</u> Reserve Price <del>(a)</del> When applicable, the <i>reserve price</i> for a <i>reserve category</i> in a particular <i>reserve zone</i> for each <i>dispatch interval</i> shall be determined as the <i>shadow price</i> on the relevant <i>reserve requirement constraint</i> , defined in accordance with Clause 3.6.1.4 (e), in the <i>dispatch optimization</i> for that <i>dispatch interval</i> and <i>published</i> by the <i>Market Operator</i> before the start of that <i>dispatch interval</i> .  <del>(b) When applicable, the <i>reserve settlement price</i> for each <i>reserve zone</i> and <i>reserve category</i> in each <i>settlement interval</i> shall be determined as the schedule-weighted average of the corresponding <i>reserve prices</i> for that <i>reserve category</i>.</del>	Clerical revisions.  Letter (b) is proposed to be deleted as the reserve prices determined in 3.10.6 (a) shall already be adopted in settlement
Determining the Reserve Trading Amount	3.13.8.2	3.13.8.2 During the initial operation of the <i>interim WESM</i> , the <i>reserve trading amount</i> shall be calculated based on the cost of <i>reserves</i> contracted for by the <i>System Operator</i> .	<del>3.13.8.2 During the initial operation of the <i>interim WESM</i>, the <i>reserve trading amount</i> shall be calculated based on the cost of <i>reserves</i> contracted for by the <i>System Operator</i>.</del>	For Deletion - This is no longer applicable as the WESM has been operating for more than 15 years and the DOE has already issued policies in relation to the reserve market.  Provisions on determining the reserve trading amounts is already elicited in Clause 3.13.8.1
	3.13.9	3.13.9 Determining the Reserve Cost Recovery Charge		

A. WESM RULES				
Title	Clause	Provision	Proposed Amendment	Rationale
Determining the Reserve Cost Recovery Charge		The <i>reserve cost recovery charge</i> for <i>settlement</i> purposes will be determined for each <i>Trading Participant</i> in each <i>settlement interval</i> in accordance with the procedures developed under clause 3.3.5.	3.13.9 Determining the Reserve Cost Recovery Charge <del>Amount</del>  <b><u>For settlement purposes, the reserve cost recovery charge amount for every reserve category and reserve region settlement purposes will shall be determined as the negative of the aggregate sum of the reserve trading amounts of the Trading Participants who supplied for that reserve category and reserve region for each Trading Participant in each settlement interval in accordance with the procedures developed under clause 3.3.5.</u></b>	Adopted Single Buyer System as prescribed in DOE DC 2021-03-0009 Section 1.4.  Propose to use reserve cost recovery amounts instead of reserve cost recovery charges, as the said amounts are to be recovered from the SO as per DOE policy.  To align with the market convention that a negative value signifies that the amount is a collectible amount of the Market Operator from the relevant entity.
Settlement Amounts for Trading Participants	3.13.11	3.13.11 Settlement Amounts for Trading Participants	3.13.11 Settlement Amounts for Trading Participants <b><u>and the System Operator</u></b>	Included the System Operator as the single buyer of reserves as prescribed in DOE DC 2021-03-0009 Section 1.4.

A. WESM RULES				
Title	Clause	Provision	Proposed Amendment	Rationale
Settlement Amounts for Trading Participants	3.13.11.1	<p>3.13.11.1 Subject to the <i>WESM Rules</i> Clause 3.13.11.4, for each <i>billing period</i>, the <i>Market Operator</i> shall determine the <i>settlement amount</i> for each <i>Trading Participant</i> as the sum of the aggregate <i>trading amounts</i> for the <i>settlement intervals</i> in that <i>billing period</i>, determined in accordance with clause 3.13.11.2: plus</p> <p>(a) Any amount payable by the <i>Market Operator</i> to that <i>Trading Participant</i> in respect of that <i>billing period</i> and not accounted for in Clause 3.13.11.2, including payment for any <i>ancillary services</i> purchased on behalf of the <i>System Operator</i>, less the sum of</p> <p>(b) Any <i>market fees</i> which that <i>Trading Participant</i> is required to pay in respect of that <i>billing period</i> as determined in accordance with Clause 2.10; plus</p> <p>(c) Any other amounts payable by that <i>Trading Participant</i> to the <i>Market Operator</i> in respect of that <i>billing period</i>, including any <i>reserve cost recovery charges</i>.</p>	<p>3.13.11.1 Subject to the <del><i>WESM Rules</i></del> Clause <del>3.13.11.4</del>, for each <i>billing period</i>, the <i>Market Operator</i> shall determine the <i>settlement amount</i> for each <i>Trading Participant</i> as the sum of the aggregate <i>trading amounts</i> for the <i>settlement intervals</i> in that <i>billing period</i>, determined in accordance with clause 3.13.11.2: plus</p> <p>(a) Any amount payable by the <i>Market Operator</i> to that <i>Trading Participant</i> in respect of that <i>billing period</i> and not accounted for in Clause 3.13.11.2, including payment for any <i>ancillary services</i> purchased on behalf of the <i>System Operator</i>, less the sum of</p> <p>(b) Any <i>market fees</i> which that <i>Trading Participant</i> is required to pay in respect of that <i>billing period</i> as determined in accordance with Clause 2.10; plus</p> <p>(c) Any other amounts payable by that <i>Trading Participant</i> to the <i>Market Operator</i> in respect of that <i>billing period</i>, <del>including any <i>reserve cost recovery charges</i>.</del></p>	<p>Clerical revisions proposed to delete this part as the said clause refers to the same section.</p> <p>Revised letter (c) to Adopt Single buyer system as prescribed in DOE DC 2021-03-0009 Section 1.4.</p>
Settlement Amounts for Trading Participants	3.13.11.2	<p>3.13.11.2 The aggregate <i>trading amount</i> for a <i>Trading Participant</i> for a <i>settlement interval</i> equals the sum of:</p> <p>a. The <i>energy trading amounts</i> for that <i>Trading Participant</i> calculated in accordance with Clause 3.13.8 (which may be positive or negative for any <i>Trading Participant</i>);</p> <p>b. The <i>reserve trading amounts</i> for each <i>reserve region</i> into which that <i>Trading Participant</i> contributes <i>reserve</i> calculated in accordance with Clause 3.13.8 (which will</p>	<p>3.13.11.2 The aggregate <i>trading amount</i> for a <i>Trading Participant</i> for a <i>settlement interval</i> equals the sum of:</p> <p>a. The <i>energy trading amounts</i> for that <i>Trading Participant</i> calculated in accordance with Clause 3.13.8 (which may be positive or negative for any <i>Trading Participant</i>);</p> <p>b. The <i>reserve trading amounts</i> for each <i>reserve region</i> into which that <i>Trading Participant</i> contributes <i>reserve</i> calculated in accordance with Clause 3.13.8 (which will</p>	<p>Remove letters (d) and (f) to Adopt Single Buyer System as prescribed in DOE DC 2021-03-0009 Section 1.4.</p>

A. WESM RULES				
Title	Clause	Provision	Proposed Amendment	Rationale
		<p>always be positive for both <i>Generation Companies</i> and <i>Customers</i>); plus</p> <p>c. The <i>transmission right trading amounts</i> for each <i>transmission right</i> held by the <i>WESM Participant</i> calculated in accordance with Clause 3.13.10 (which will typically be positive for any <i>Trading Participant</i>); less the sum of</p> <p>d. The <i>reserve cost recovery charge</i> determined for that <i>Trading Participant</i> with respect to any <i>reserve cost recovery zone</i> within which it has any <i>facility connected</i> calculated in accordance with the procedures developed under clause 3.3.5 (which will be positive for any <i>Trading Participant</i>); and</p> <p>f. Any other <i>reserve cost recovery charges</i> determined for that <i>Trading Participant</i> in accordance with the procedures developed under clause 3.3.5 (which will be positive for any <i>Trading Participant</i>).</p>	<p>always be positive for both <i>Generation Companies</i> and <i>Customers</i>); plus</p> <p>c. The <i>transmission right trading amounts</i> for each <i>transmission right</i> held by the <i>WESM Participant</i> calculated in accordance with Clause 3.13.10 (which will typically be positive for any <i>Trading Participant</i>); <del>less the sum of</del></p> <p>d. <del>The <i>reserve cost recovery charge</i> determined for that <i>Trading Participant</i> with respect to any <i>reserve cost recovery zone</i> within which it has any <i>facility connected</i> calculated in accordance with the procedures developed under clause 3.3.5 (which will be positive for any <i>Trading Participant</i>); and</del></p> <p>f. <del>Any other <i>reserve cost recovery charges</i> determined for that <i>Trading Participant</i> in accordance with the procedures developed under clause 3.3.5 (which will be positive for any <i>Trading Participant</i>).</del></p>	
Settlement Amounts for Trading Participants	(new)		<b><u>3.13.11.4 For each <i>billing period</i>, the <i>Market Operator</i> shall determine the <i>settlement amount</i> for the <i>System Operator</i> as the sum of the <i>aggregate reserve recovery amounts</i> for the <i>settlement intervals</i> in that <i>billing period</i>.</u></b>	To define how the reserve recovery amounts is calculated for each billing period, to be recovered from the System Operator, as prescribed in DOE

A. WESM RULES				
Title	Clause	Provision	Proposed Amendment	Rationale
				DC 2021-03-0009 Section 1.4.
GLOSSAR Y		<b>Dispatchable Reserve.</b> Generating capacity that is not scheduled for regular energy supply, regulating reserve, contingency reserve, or interruptible loads not scheduled for contingency reserve, and that are readily available for dispatch in order to replenish the contingency reserve service whenever a generating unit trips or a loss of a single transmission interconnection occurs.	<del>Dispatchable Reserve. Generating capacity that is not scheduled for regular energy supply, regulating reserve, contingency reserve, or interruptible loads not scheduled for contingency reserve, and that are readily available for dispatch in order to replenish the e</del> <b>Contingency Reserves</b> service whenever a generating unit trips or a loss of a single transmission interconnection occurs.	To harmonize with definition of dispatchable reserve in Section 4.1 of DOE DC2021-03-0009.
GLOSSAR Y		<b>(new)</b>	<b><u>Qualified Generating Unit. A Generating Unit tested, certified and monitored by the System Operator to provide specific types of Ancillary Services.</u></b>	To provide definition of qualified generating unit as mentioned in Clause 3.3.4.2 and as defined in PGC 2016
GLOSSAR Y		<b>new)</b>	<b><u>Qualified Interruptible Load. A Load that is tested, certified and monitored by the System Operator to provide Tertiary Reserve Ancillary Service.</u></b>	To provide definition of qualified generating unit as mentioned in Clause 3.3.4.2 and as defined in PGC 2016
GLOSSAR Y		<b>Reserve. xxx</b>  <b>Reserve Facility Category.</b> A particular type of reserve facility, characterized by its technology (e.g. interruptible load, synchronized generation, non-synchronized generation) which is reflected in the type of offer it can make. (As amended by DOE DC No. 2016-10-0014 dated 14 October 2016)	<b>Reserve. xxx</b>  <del><b>Reserve Facility Category.</b> A particular type of reserve facility, characterized by its technology (e.g. interruptible load, synchronized generation, non-synchronized generation) which is reflected in the type of offer it can make. (As amended by DOE DC No. 2016-10-0014 dated 14 October 2016)</del>	Definition was repeated in the glossary
GLOSSAR Y		<b>(new)</b>	<b><u>Reserve Conformance Standards. Standards that set the criteria and procedures for determining whether</u></b>	Clause 3.3.7.4 refers to “reserve

A. WESM RULES				
Title	Clause	Provision	Proposed Amendment	Rationale
			<b><u>the Ancillary Service Providers comply with their reserve schedules, and which are required to be set out in a Market Manual in accordance with Clause 3.8.7.</u></b>	effectiveness factor” instead of “reserve conformance standards”. While the DOE DC2021-03-0009 states that reserve effectiveness factor could be one of the reserve conformance standards, there is no clear provision on this in the WESM Rules. Thus, the need to provide the definition for reserve conformance standards.
GLOSSAR Y		(new)	<b><u>Reserve Cost Recovery Amount. The amount to be recovered from the System Operator pertaining to the negative of the aggregate sum of the reserve trading amounts of the Trading Participants who supplied for reserves.</u></b>	For consistency with the proposed changes in Clause 3.13.19.
GLOSSAR Y		(new)	<b><u>Reserve Effectiveness Factor. A performance indicator that measures the reserve facility’s adequacy, accuracy, and timeliness in its actual reserve response with respect to the expected operating parameters set for a specific type of reserve.</u></b>	To provide definition of reserve effectiveness factor which is mentioned in Clause 3.3.7.4.

B. WESM Manual on Price Determination Methodology				
Title	Clause	Provision	Proposed Amendment	Rationale
Scope	1.3	<p>This <i>Market Manual</i> provides the following:</p> <ul style="list-style-type: none"> <li>a. Methodology by which <i>energy</i> shall be priced and settled in accordance with the market design principles as issued by the <i>DOE</i>;</li> <li>b. Methodology by which <i>energy</i> in the <i>WESM</i> shall be priced, including the determination of prices when there is extreme price separation due to <i>network congestion</i>, and determination of <i>administered prices</i> during <i>market suspension</i> and <i>market intervention</i>;</li> <li>c. Methodology by which <i>energy</i> shall be settled in the <i>WESM</i>, the determination of additional compensation, as applicable, and the determination and allocation of <i>net settlement surplus</i>; and</li> <li>a) Computational formula that will enable the <i>WESM participants</i> to verify the correctness of the charges being imposed.</li> </ul>	<p>This <i>Market Manual</i> provides the following:</p> <ul style="list-style-type: none"> <li>a. Methodology by which <i>energy</i> <b><u>and reserves</u></b> shall be priced and settled in accordance with the market design principles as issued by the <i>DOE</i>;</li> <li>b. Methodology by which <i>energy</i> <b><u>and reserves</u></b> in the <i>WESM</i> shall be priced, including the determination of prices when there is extreme price separation due to <i>network congestion</i>, and determination of <i>administered prices</i> during <i>market suspension</i> and <i>market intervention</i>;</li> <li>c. Methodology by which <i>energy</i> <b><u>and reserves</u></b> shall be settled in the <i>WESM</i>, the determination of additional compensation, as applicable, and the determination and allocation of <i>net settlement surplus</i>; and</li> </ul> <p>Computational formula that will enable the <i>WESM participants</i> to verify the correctness of the charges being imposed.</p>	<p>Included in 2017 PDM filing. For inclusion of reserve pricing and settlement in the Scope. This is the original wording as per the original version of the EWDO PDM.</p>
Reserves	4.11	<p>4.11 Reserves</p> <p><i>Reserve and energy dispatch schedules</i> shall be determined in a co-optimized manner in the <i>market dispatch optimization model</i>.</p>	<p>4.11 Reserves</p> <p><b><u>4.11.1</u></b> <i>Reserve and energy dispatch schedules</i> shall be determined in a co-optimized manner in the <i>market dispatch optimization model</i>. <b><u>An illustrative example on the co-optimization of energy and reserve is provided for in Appendix F of this Market Manual.</u></b></p>	<ul style="list-style-type: none"> <li>• Added numberings as this section shall contain more details with the proposed amendments</li> <li>• To provide illustrative example on the co-optimization of energy and reserve</li> </ul>

B. WESM Manual on Price Determination Methodology				
Title	Clause	Provision	Proposed Amendment	Rationale
Reserves	(new)	(New)	<b><u>4.11.2 The <i>reserve regions</i> shall initially consist of the Luzon, Visayas, and Mindanao Grids.</u></b>	Reflecting the System Operator's current practice that reserve requirements are set for each Grid  Initially part of the PDM filed to ERC in March 2017 (Originally 4.11.6)
Reserves	(New)	(New)	<b><u>4.11.3 The <i>reserve price for each reserve region and reserve category</i> shall be determined as the shadow price on the relevant <i>reserve requirement constraint</i> in the dispatch optimization for that <i>dispatch interval</i>.</u></b>	Explains on where the reserve price is derived from the MDOM  Initially part of the PDM filed to ERC in March 2017 (Originally 4.11.6)
Application of WESM Prices	4.12.1	In general, the nodal prices resulting from the <i>real-time dispatch market run</i> as determined in Section 4.4.4, and, as applicable, Section 4.4.5, shall be used as <i>final nodal energy prices</i> in the calculation of <i>settlements</i> except if there are non-zero constraint violation variable values or pricing error notices: <ol style="list-style-type: none"> <li>a. If there are one or more non-zero <i>constraint violation variable</i> values, then <i>automatic pricing re-run</i> prices in accordance with Section 5.2 shall apply; and</li> <li>b. If there are pricing errors, prices from market pricing re-runs under Section 5.3 shall apply.</li> </ol>	In general, the nodal prices resulting from the <i>real-time dispatch market run</i> as determined in Section 4.4.4, and, as applicable, Section 4.4.5, shall be used as <i>final nodal energy prices</i> <b><u>and reserve prices</u></b> in the calculation of <i>settlements</i> except if there are non-zero constraint violation variable values or pricing error notices: <ol style="list-style-type: none"> <li>a. If there are one or more non-zero <i>constraint violation variable</i> values, then <i>automatic pricing re-run</i> prices in accordance with Section 5.2 shall apply; and</li> </ol>	<ul style="list-style-type: none"> <li>• Added reserve prices</li> <li>• Initially part of the PDM filed to ERC in March 2017. Updated to reflect verbatim wordings</li> </ul>

B. WESM Manual on Price Determination Methodology													
Title	Clause	Provision	Proposed Amendment		Rationale								
			b. If there are pricing errors, prices from market pricing re-runs under Section 5.3 shall apply.										
Automatic Pricing Re-run	5.2.1	5.2.1 <i>Automatic pricing reruns for market projections and real-time dispatch</i> shall ensure that the <i>energy prices</i> reflect the marginal costs of supplying <i>energy</i> at each <i>node</i> , regional, or island level.	5.2.1 <i>Automatic pricing reruns for market projections and real-time dispatch</i> shall ensure that the <i>energy prices</i> <b>and reserve prices</b> reflect the marginal costs of supplying <i>energy</i> at each <i>node</i> , regional, or island level; <b><u>and the marginal costs of supplying reserves.</u></b>		Include reserves as considerations of automatic pricing reruns. Initially part of the PDM filed to ERC in March 2017. Updated to only include marginal costs of supplying reserves. Shortage pricing and excess pricing were not included.								
Automatic Pricing Re-run	5.2.2	5.2.2 The <i>automatic pricing re-run of the market dispatch optimization model</i> shall determine the prices for <i>energy</i> with relaxed <i>constraints</i> and shall have approximately the same <i>dispatch schedules</i> .	5.2.2 The <i>automatic pricing re-run of the market dispatch optimization model</i> shall determine the prices for <i>energy</i> <b>and reserves</b> with relaxed <i>constraints</i> and shall have approximately the same <i>dispatch schedules</i> .		Include reserves as considerations of automatic pricing reruns. Initially part of the PDM filed to ERC in March 2017.								
Automatic Pricing Re-run	5.2.5	5.2.5 The following table shows each type of <i>constraints</i> with their corresponding <i>constraint</i> relaxation formulas during pricing re-runs:	5.2.5 The following table shows each type of <i>constraints</i> with their corresponding <i>constraint</i> relaxation formulas during pricing re-runs:		Included reserve prices as part of the re-run price. Initially part of the PDM filed to ERC in March 2017.								
			<table border="1"> <thead> <tr> <th>Soft Constraint</th> <th>Violation</th> <th>Constraint Relaxation during Pricing Re-Run</th> <th>Re-run Price<sup>2</sup></th> </tr> </thead> <tbody> <tr> <td>Thermal Base Case</td> <td>X</td> <td>x + delta</td> <td>EDP <b>and RP</b></td> </tr> </tbody> </table>		Soft Constraint	Violation	Constraint Relaxation during Pricing Re-Run	Re-run Price <sup>2</sup>	Thermal Base Case	X	x + delta	EDP <b>and RP</b>	
Soft Constraint	Violation	Constraint Relaxation during Pricing Re-Run	Re-run Price <sup>2</sup>										
Thermal Base Case	X	x + delta	EDP <b>and RP</b>										

B. WESM Manual on Price Determination Methodology										
Title	Clause	Provision				Proposed Amendment				Rationale
		Soft Constraint	Violation	Constraint Relaxation during Pricing Re-Run	Re-run Price <sup>4</sup>	Transmission Group	X	x + delta	EDP <u>and RP</u>	
		Thermal Base Case	X	x + delta	EDP	Self-Scheduled Generation Constraint	X	x + delta	EDP <u>and RP</u>	
		Transmission Group	X	x + delta	EDP	System Energy Balance (Over-generation and under-generation)	X	x + delta	EDP <u>and RP</u>	
		Self-Scheduled Generation Constraint	X	x + delta	EDP	Nodal Value of Lost Load or Nodal Energy Balance	X	x + delta	EDP <u>and RP</u>	
		System Energy Balance (Over-generation and under-generation)	X	x + delta	EDP	Thermal Contingency	X	x + delta	EDP <u>and RP</u>	
		Nodal Value of Lost Load or Nodal Energy Balance	X	x + delta	EDP	Reserve Requirement	X	x + delta	EDP <u>and RP</u>	
		Thermal Contingency	X	x + delta	EDP					
		Reserve Requirement	X	x + delta	EDP					
Price Substitution for Reserve Prices	6.5	(new)				<b><u>6.5 Price Substitution Methodology for Reserve Prices</u></b>  <b><u>In cases where price substitution methodology is applied, the reserve price for a certain reserve category in a reserve region shall be calculated as the sum of the constrained solution's marginal reserve offer price and the opportunity cost</u></b>				

<sup>4</sup> EDP refers to nodal energy dispatch price

B. WESM Manual on Price Determination Methodology				
Title	Clause	Provision	Proposed Amendment	Rationale
			<b><u>calculated based on the unconstrained solution. It shall be determined as the shadow price calculated based on the unconstrained solution.</u></b>	opportunity cost is a component of the reserve price.
Administered Prices	7.1.2	<p>7.1.2 The <i>administered price</i> shall be established by the <i>Market Operator</i> in accordance with the following <i>guiding principles</i>:</p> <p>a. The <i>administered price</i> shall be fair and reasonable to both the suppliers and consumers of electricity.</p> <p>b. <i>Administered prices</i> shall be determined and shall replace <i>market prices</i> for energy, i.e. energy administered prices shall replace the nodal energy dispatch prices.</p> <p>c. The process for determining the <i>administered price</i> shall be transparent to the <i>Trading Participants</i> and administratively simple to implement.</p> <p>d. The process for determining the <i>administered price</i> shall be based on the market information available prior to <i>market intervention</i> or <i>market suspension</i>.</p> <p>e. The <i>administered price</i> shall be applied in the region where the <i>market suspension</i> or <i>market intervention</i> is declared. For this purpose, the regions are Luzon, Visayas and Mindanao.</p> <p>f. The <i>administered price</i> will apply only to transactions above the declared <i>bilateral contract</i> quantities.</p> <p>g. The <i>administered price</i> will be used for settlement of transactions in dispatch intervals during market intervention and suspension where the Market Operator is unable to generate a market schedule.</p> <p>h. Where <i>market suspension</i> or <i>market intervention</i> is declared in an island grid (“grid islanding”), the <i>administered prices</i> shall be applied only to the</p>	<p>7.1.2 The <i>administered price</i> shall be established by the <i>Market Operator</i> in accordance with the following <i>guiding principles</i>:</p> <p>a. The <i>administered price</i> shall be fair and reasonable to both the suppliers and consumers of electricity.</p> <p>b. <i>Administered prices</i> shall be determined and shall replace <i>market prices</i> for energy, i.e. energy administered prices shall replace the nodal energy dispatch prices, <b><u>and reserves, i.e. reserve administered prices shall replace the reserve prices.</u></b></p> <p>c. The process for determining the <i>administered price</i> shall be transparent to the <i>Trading Participants</i> and administratively simple to implement.</p> <p>d. The process for determining the <i>administered price</i> shall be based on the market information available prior to <i>market intervention</i> or <i>market suspension</i>.</p> <p>e. The <i>administered price</i> shall be applied in the region where the <i>market suspension</i> or <i>market intervention</i> is declared. For this purpose, the regions are Luzon, Visayas and Mindanao.</p> <p>f. The <i>administered price</i> will apply only to transactions above the declared <i>bilateral contract</i> quantities.</p> <p>g. The <i>administered price</i> will be used for settlement of transactions in dispatch intervals during market intervention and suspension where the Market Operator is unable to generate a market schedule.</p> <p>h. Where <i>market suspension</i> or <i>market intervention</i> is declared in an island grid (“grid islanding”), the</p>	<ul style="list-style-type: none"> <li>• Added reserve prices in the determination of the AP</li> <li>• Initially part of the PDM filed to ERC in March 2017.</li> </ul>

B. WESM Manual on Price Determination Methodology				
Title	Clause	Provision	Proposed Amendment	Rationale
		resources in the island grid where the <i>market suspension</i> or <i>market intervention</i> was declared.	<i>administered prices</i> shall be applied only to the resources in the island grid where the <i>market suspension</i> or <i>market intervention</i> was declared.	
Reserve Administered Price	(new)	(new)	<p><b><u>7.4 Reserve Administered Price</u></b></p> <p><b><u>7.4.1 In case two (2) or more of the four (4) most recent similar trading days and similar dispatch intervals have not been administered, the reserve administered price for each reserve category in every reserve region shall be computed as follows:</u></b></p> <p><b><u>a. The aggregate reserve dispatch schedule-weighted average of the reserve prices for each reserve category in every reserve region of the four (4) most recent similar trading days and similar dispatch intervals that have not been administered, as set out in the following formula:</u></b></p> $RAP_{r,a,D,i} = \frac{\sum_{d=D-1}^{D-n} (RP_{r,a,d,i} * \sum_{k \in K_{r,a,d,i}} RDS_{k,r,a,d,i})}{\sum_{d=D-1}^{D-n} \sum_{k \in K_{r,a,d,i}} RDS_{k,r,a,d,i}}$ <p><b><u>Where:</u></b></p>	<ul style="list-style-type: none"> <li>• Based the mechanism on the way Administered Prices for Energy is determined</li> <li>• Generalized the market resource to consider loads acting as reserve providers.</li> <li>• Reserve administered prices are to be computed per reserve region and applied to each reserve provider resource belonging to a reserve region.</li> </ul>

B. WESM Manual on Price Determination Methodology				
Title	Clause	Provision	Proposed Amendment	Rationale
			<p><u><math>RAP_{r,a,D,i}</math></u> refers to the <u>reserve administered price for reserve category <math>r</math> in reserve region <math>a</math> at dispatch interval <math>i</math> within trading day <math>D</math></u></p> <p><u><math>RP_{r,a,d,i}</math></u> refers to the <u>reserve price for reserve category <math>r</math> in reserve region <math>a</math> at dispatch interval <math>i</math> within trading day <math>d</math></u></p> <p><u><math>RDS_{k,r,a,d,i}</math></u> refers to the <u>reserve dispatch schedule for reserve provider resource <math>k</math> for reserve category <math>r</math> in reserve region <math>a</math> at dispatch interval <math>i</math> within trading day <math>d</math></u></p> <p><u><math>D</math></u> refers to the <u>trading day with dispatch interval under market intervention or market suspension</u></p> <p><u><math>d = D - n</math></u> refers to the <u><math>n^{th}</math> most recent non-administered similar trading day and similar dispatch interval</u></p> <p><u><math>n</math></u> refers to the <u>number of similar trading days and dispatch intervals that have not been administered from the four (4) most recent similar trading days and dispatch intervals</u></p>	
Reserve Administered Price	(new)	(new)	<p><u>7.4.2 In case three (3) or all of the four (4) most recent similar trading days and similar dispatch intervals have been administered, the reserve administered price for each reserve category in every reserve region shall be computed as follows:</u></p>	<ul style="list-style-type: none"> <li>Based the mechanism on the way Administered Prices for Energy is determined</li> </ul>

B. WESM Manual on Price Determination Methodology				
Title	Clause	Provision	Proposed Amendment	Rationale
			<p><b><u>a. The aggregate reserve dispatch schedule-weighted average of the reserve administered prices of the similar trading days and similar dispatch intervals as set out in the following formula:</u></b></p> $RAP_{k,D,i} = \frac{\sum_{d=D-n}^{D-1} (RAP_{k,d,i} * \sum_{k \in K_{r,a,d,i}} RDS_{k,r,a,d,i})}{\sum_{k \in K_{r,a,d,i}} RDS_{k,r,a,d,i}}$ <p><b><u>Where:</u></b></p> <p><b><u>RAP<sub>k,D,i</sub></u></b> refers to the <b><u>reserve administered price for reserve provider resource k at dispatch interval i within trading day D</u></b></p> <p><b><u>RAP<sub>k,d,i</sub></u></b> refers to the <b><u>reserve administered price for reserve provider resource k for dispatch interval i within trading day d</u></b></p> <p><b><u>RDS<sub>k,r,a,d,i</sub></u></b> refers to the <b><u>reserve dispatch schedule for reserve provider resource k for reserve category r in reserve region a at dispatch interval i within trading day d</u></b></p> <p><b><u>D</u></b> refers to the <b><u>current trading day</u></b></p> <p><b><u>d = D – n</u></b> refers to the <b><u>n<sup>th</sup> most recent similar trading day of D</u></b></p> <p><b><u>n</u></b> refers to the <b><u>number of similar trading days and dispatch intervals that have not been</u></b></p>	<ul style="list-style-type: none"> <li>Generalized the market resource to consider loads acting as reserve providers.</li> <li>Reserve administered prices are to be computed per reserve region and applied to each reserve provider resource belonging to a reserve region.</li> </ul>

B. WESM Manual on Price Determination Methodology				
Title	Clause	Provision	Proposed Amendment	Rationale
			<u>administered from the four (4) most recent similar trading days and dispatch intervals</u>	
Reserve Administered Price	(new)	(new)	<u>7.4.3 For each reserve provider resource, the reserve dispatch schedule shall be set to the reserve schedules determined by the System Operator for the dispatch interval under market suspension or market intervention.</u>	Same as previous
Reserve Administered Price	(new)	(new)	<u>7.4.4 Similar trading days refer to each day of the week (i.e., Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday) while similar dispatch intervals refer to the same period within the same settlement interval.</u>	Same as previous
Reserve Trading Amount	(new)	(new)	<p><u>8.2.2 Reserve Trading Amount<sup>5</sup></u></p> <p><u>a. The reserve quantity for any reserve provider resource in any dispatch interval shall be determined by the Market Operator as the reserve dispatch schedule less reserve contracted quantities, as shown in the following formula:</u></p> $RQ_{j, r, a, I} = (RDS_{j, r, a, i} - RBCQ_{j, r, a, i})$ <p><u>Where:</u></p> <p><u><math>RQ_{j, r, a, i}</math> refers to the reserve quantity of reserve provider resource <math>j</math> for</u></p>	Provided mathematical details on how the reserve trading amounts are computed. Initially part of the PDM filed to ERC in March 2017 but with changes on nomenclature of reserve dispatch price to reserve price and application of reserve price per region instead of per resource.

<sup>5</sup> WESM Rules Clause 3.13

B. WESM Manual on Price Determination Methodology				
Title	Clause	Provision	Proposed Amendment	Rationale
			<p><u>reserve category r and reserve region a at dispatch interval i</u></p> <p><u><math>RDS_{i,r,a,i}</math> refers to the reserve dispatch schedule of reserve provider resource j for reserve category r and reserve region a at dispatch interval i</u></p> <p><u><math>RBCQ_{i,r,a,i}</math> refers to the bilateral contract quantity for reserve provider resource j for reserve category r and reserve region a at dispatch interval i</u></p> <p><u>a. The reserve trading amount for each trading participant that supplies reserve to a particular reserve region in a settlement interval shall be determined as the reserve prices for that reserve region multiplied by the reserve quantities for that trading participant in that reserve region for the dispatch intervals of the relevant settlement interval.</u></p> $RTA_{p,r,a,h} = \sum_{i \in h} \left[ \frac{1}{n} \sum_{j \in p} (RP_{r,a,i} * RQ_{j,r,a,i}) \right]$ <p><u>Where:</u></p>	

B. WESM Manual on Price Determination Methodology				
Title	Clause	Provision	Proposed Amendment	Rationale
			<p><u><math>RTA_{p,r,a,h}</math></u> refers to the <i>reserve trading amount of trading participant p for reserve category r and reserve region a at settlement interval h</i></p> <p><u><math>RP_{r,a,i}</math></u> refers to the <i>reserve price for reserve category r and reserve region a at dispatch interval i in settlement interval h</i></p> <p><u><math>RQ_{j,r,a,i}</math></u> refers to the <i>reserve quantity of reserve provider resource j for reserve category r and reserve region a at dispatch interval i in settlement interval h</i></p> <p><u><math>J_p</math></u> refers to the <i>set of reserve provider resources under trading participant p</i></p> <p><u><math>n</math></u> refers to the <i>number of dispatch intervals within a settlement interval, which is 12 for a five-minute market</i></p>	
Reserve Cost Recovery Amount	(new)	(new)	<p><b><u>8.2.3 Reserve Cost Recovery Amount</u></b></p> <p>a. <b><u>The reserve cost shall be recovered from the System Operator.</u></b></p> <p>b. <b><u>The reserve cost recovery amount for every reserve category and reserve region shall be determined as the negative of the aggregate sum of the reserve trading amounts of the trading participants who supplied for that reserve category and reserve region, using the formula represented as:</u></b></p>	As prescribed in the Single Buyer System in DOE DC 2021-03-0009 Section 1.4

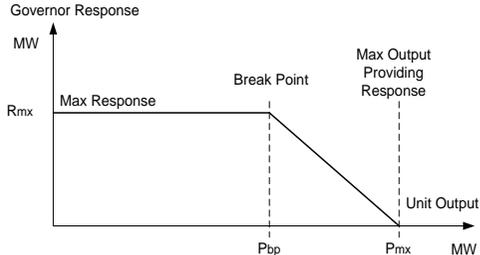
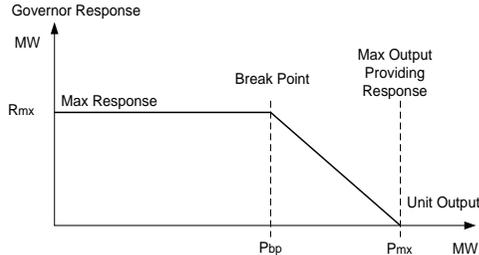
B. WESM Manual on Price Determination Methodology				
Title	Clause	Provision	Proposed Amendment	Rationale
			$RRCost_{r, a, h} = (-1) \sum_{p \in P} RTA_{p, r, a, h}$ <p><b>Where:</b></p> <p><b><u>RRCost<sub>r, a, h</sub></u></b> refers to the <b>reserve cost for reserve category r in reserve region a at settlement interval h</b></p> <p><b><u>RTA<sub>p, r, a, h</sub></u></b> refers to the <b>reserve trading amount of trading participant p for reserve category r and reserve region a at settlement interval h</b></p> <p><b><u>P</u></b> refers to the <b>set of trading participants</b></p>	
Aggregate Trading Amount	8.2.2	<p>8.2.2 Aggregate Trading Amount</p> <p>a. The aggregate <i>trading amount</i> for a <i>Trading Participant</i> for a <i>settlement interval</i> is determined shall be determined as follows:<sup>6</sup></p> <p><i>Energy trading amounts</i>, which may be positive or negative for any <i>Trading Participant</i>.</p> <p>b. This is provided in the following formula:</p> $TA_{p,h} = ETA_{p,h}$	<p>8.2.<del>2</del><u>4</u> Aggregate Trading Amount</p> <p>a. The aggregate <i>trading amount</i> for a <i>Trading Participant</i> for a <i>settlement interval</i> is determined shall be determined as follows: <sup>4</sup></p> <p><b><u>(1)</u></b> <i>Energy trading amounts</i>, which may be positive or negative for any <i>Trading Participant</i>.</p> <p><b><u>(2) Reserve trading Amounts</u></b></p> <p>b. This is provided in the following formula:</p>	<ul style="list-style-type: none"> <li>Added reserve trading amounts in the calculation of trading amounts</li> <li>Initially part of the PDM filed to ERC in March 2017</li> </ul>

<sup>6</sup> WESM Rules Clause 3.13

B. WESM Manual on Price Determination Methodology				
Title	Clause	Provision	Proposed Amendment	Rationale
		<p>Where:</p> <p><math>TA_{p,h}</math> refers to the aggregate <i>trading amount</i> of <i>trading participant p</i> for <i>settlement interval h</i></p> <p><math>ETA_{ph}</math> refers to the <i>energy trading amount</i> of <i>trading participant p</i> at <i>settlement interval h</i></p>	<p><math>TA_{p,h} = ETA_{p,h} + RTA_{p,h}</math></p> <p>Where:</p> <p><math>TA_{p,h}</math> refers to the aggregate <i>trading amount</i> of <i>trading participant p</i> for <i>settlement interval h</i></p> <p><math>ETA_{p,h}</math> refers to the <i>energy trading amount</i> of <i>trading participant p</i> at <i>settlement interval h</i></p> <p><b><u><math>RTA_{p,h}</math> refers to the reserve trading amount of trading participant p at settlement interval h</u></b></p>	
Settlement Amounts	(new)	(new)	<p><b><u>8.4.3 For each <i>billing period</i>, the <i>Market Operator</i> shall determine the <i>settlement amount</i> for the <i>System Operator</i> as the sum of the aggregate <i>reserve recovery amounts</i> for the <i>settlement intervals</i> in that <i>billing period</i>. This is provided in the following formula:</u></b></p> $SA_{so,r,a,m} = \sum_{h \in H_m} \sum_{a \in A} \sum_{r \in R} RRCost_{r,a,h}$ <p><b><u>Where:</u></b></p> <p><b><u><math>SA_{so,m}</math> refers to the <i>settlement amount</i> of the <i>System Operator</i> for <i>billing period m</i></u></b></p> <p><b><u><math>RRCost_{r,a,h}</math> refers to the <i>reserve cost</i> for <i>reserve category r</i> in <i>reserve region a</i> at <i>settlement interval h</i></u></b></p> <p><b><u><math>H_m</math> refers to the <i>settlement interval</i> under <i>billing period m</i></u></b></p>	<p>Provided provision to calculate the Settlement Amounts for the System Operator</p>

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Title	Clause	Provision	Proposed Amendment	Rationale
			<p><b>R</b> refers to the set of <i>reserve categories</i></p> <p><b>A</b> refers to the set of <i>reserve regions</i></p>	
Reserve Requirements	Appendix A Section 2.2	<p>Contingency Reserve Requirements</p> <p>2.2.5 Analogously to Regulating Reserve Raise and Regulating Reserve Lower minimal requirements, regional minimum requirements can be specified for other ancillary services (AS) and for each time interval:</p> $Res_{ASreq}^t \leq \sum_{unit \in AS} Res_{unit}^t ; t \in T$	<p>Contingency, <b><u>Dispatchable and other</u></b> Reserve Requirements</p> <p>2.2.5 Analogously to Regulating Reserve Raise and Regulating Reserve Lower minimal requirements, regional minimum requirements can be specified for other ancillary services (AS) and for each time interval:</p> $Res_{ASreq}^t \leq \sum_{unit \in AS} Res_{unit}^t$	Minor edits to include Dispatchable Reserve
Generating/Load Resource Constraints – Reserve Model	Appendix A Section 4.3.1	<p>4.3.1 Core parts of the <i>Reserve</i> model are:</p> <ul style="list-style-type: none"> <li>a. <i>Reserve</i> capacity limits</li> <li>b. <i>Reserve</i> ramping</li> <li>c. Combined <i>Energy</i> and <i>reserve</i> capacity limits</li> <li>d. Combined <i>Energy</i> and <i>reserve</i> ramping</li> <li>e. Independent model for Raise and Lower service in each <i>reserve</i> category</li> </ul>	<p>4.3.1 Core parts of the <i>Reserve</i> model are:</p> <ul style="list-style-type: none"> <li>a. <i>Reserve</i> capacity limits</li> <li>b. <i>Reserve</i> ramping</li> <li>c. Combined <i>Energy</i> and <i>reserve</i> capacity limits</li> <li>d. Combined <i>Energy</i> and <i>reserve</i> ramping</li> <li>e. Independent model for Raise and Lower service in each <i>reserve</i> category</li> <li><b><u>f. Constraints on Simultaneous Provisions of reserve</u></b></li> </ul>	Added item in compliance with Section 3.1.1.3 of DC2021-03-0009
Generating/Load Resource Constraints –		<p>Resource Reserve capacity limits</p> <p>4.3.2 In addition to limits imposed by <i>reserve offer</i> limits, there are physical unit limits that affect <i>reserve</i> award. One example is for fast and slow <i>reserves</i> limitation by Governor response.</p>	<p><b><u>4.3.2</u></b> Resource Reserve capacity limits</p> <p><b><u>4.3.2.1</u></b> In addition to limits imposed by <i>reserve offer</i> limits, there are physical unit limits that affect <i>reserve</i> award. One example is for <del>fast and slow</del> <b><u>contingency and dispatchable</u></b> reserves</p>	Clerical revisions for consistency and to correct numberings

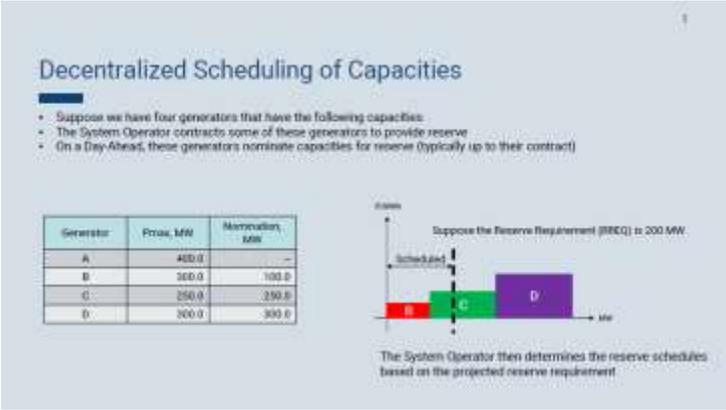
**B. WESM Manual on Price Determination Methodology**

Title	Clause	Provision	Proposed Amendment	Rationale
Reserve Model		<p>While Governor response also depends on frequency deviation, it is usually one curve provided for Market purpose, where response is given as function of <i>energy</i> output only. Typical Governor response curve is provided below:</p>  <p>Figure 1: Governor <i>n</i> second raise droop characteristic</p> <p>4.3.3 Each two-piece characteristic comprises:</p> <p>xxx</p> <p>4.3.4 The mathematical formulation using the variable designation from Figure 2 are as follows:</p> $Res_{unit}^t = R_{mx} * (P_{mx} - P^t) / (P_{mx} - P_{bp}) \quad \forall P \geq P_{bp}$ $Res_{unit}^t = P_{mx} \quad \forall P < P_{bp}$ <p>4.3.5 In addition to maximum quantity, contracted generators might be subject to mandatory governor response, which is modeled as <i>reserve self-schedule</i> and protected with penalty in Scheduling Run (i.e. treated as price taker). Such self-schedule also contributes to regional <i>reserve requirements</i>.</p>	<p>limitation by Governor response. While Governor response also depends on frequency deviation, it is usually one curve provided for Market purpose, where response is given as function of <i>energy</i> output only. Typical Governor response curve is provided below:</p>  <p>Figure 2: Governor <i>n</i> second raise droop characteristic</p> <p>4.3.<del>3</del><u>2</u> Each two-piece characteristic comprises:</p> <p>xxx</p> <p>4.3.<del>4</del><u>2</u>.<del>3</del> The mathematical formulation using the variable designation from Figure 2 are as follows:</p> $Res_{unit}^t = R_{mx} * (P_{mx} - P^t) / (P_{mx} - P_{bp}) \quad \forall P \geq P_{bp}$ $Res_{unit}^t = P_{mx} \quad \forall P < P_{bp}$ <p>4.3.<del>5</del><u>2</u>.<del>4</del> In addition to maximum quantity, contracted generators might be subject to mandatory governor response, which is modeled as <i>reserve self-schedule</i> and protected with penalty in Scheduling Run (i.e. treated as price</p>	



B. WESM Manual on Price Determination Methodology				
Title	Clause	Provision	Proposed Amendment	Rationale
			taker). Such self-schedule also contributes to regional <i>reserve requirements</i> .	
Generating/Load Resource Constraints – Reserve Model	4.3.6	Resource AS ramping limits  The individual <i>reserve</i> ramping constraint can be posted for each resource and each time interval. These <i>constraints</i> are expressed in time domain as follows (equation is provided for Regulation Raise, but analogous equation applies for each <i>reserve</i> ):  $\frac{Reg_{unit}^{Raise;t}}{RR_{unit}^{RegUp}} \leq T^{AS}; \quad unit \in G; t \in T$  meaning that the <i>Reserve</i> ramping cannot exceed the specified <i>reserve</i> ramping (default 5 minutes).	<b>4.3.3</b> Resource AS ramping limits  <del>4.3.6</del> <b>3.1</b> The individual <i>reserve</i> ramping constraint can be posted for each resource and each time interval. These <i>constraints</i> are expressed in time domain as follows (equation is provided for Regulation Raise, but analogous equation applies for each <i>reserve</i> ):  $\frac{Reg_{unit}^{Raise;t}}{RR_{unit}^{RegUp}} \leq T^{AS}; \quad unit \in G; t \in T$  meaning that the <i>Reserve</i> ramping cannot exceed the specified <i>reserve</i> ramping (default 5 minutes).	Clerical revisions to correct numberings
Generating/Load Resource Constraints – Reserve Model	4.3.7 4.3.8 4.3.9 4.3.10 4.3.11	Resource Combined Energy and Reserve Capacity Limits  xxx. xxx xxx xxx xxx	<b>4.3.4</b> Resource Combined Energy and Reserve Capacity Limits  <del>4.3.7</del> <b>4.1</b> xxx  <del>4.3.8</del> <b>4.2</b> xxx  <del>4.3.9</del> <b>4.3</b> xxx  <del>4.3.10</del> <b>4.4</b> xxx  <del>4.3.11</del> <b>4.5</b> xxx	Clerical revisions to correct numberings
Generating/Load Resource Constraints	4.3.12	Resource Combined Energy and Reserve Ramping  xxx	<b>4.3.5</b> Resource Combined Energy and Reserve Ramping  <del>4.3.12</del> <b>5.1</b> xxx	Clerical revisions to correct numberings

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Title	Clause	Provision	Proposed Amendment	Rationale
s – Reserve Model				
Generating/Load Resource Constraints – Reserve Model	4.4 4.4.1 4.4.2	Other Operational Modes of Generators, Loads or Similar Facilities xxx xxx	<b>4.3.6</b> Other Operational Modes of Generators, Loads or Similar Facilities  4-4. <b>3.6.1</b> xxx  4-4. <b>3.6.2</b> xxx	Clerical revisions to correct numberings
Constraints on Simultaneous Provision of Reserve	(new)	(new)	<b><u>4.3.7 Constraints on Simultaneous Provision of Reserve</u></b>  <b><u>4.3.7.1 Limitations on the provision of reserve awards are also considered in the MDOM.</u></b>  <b><u>4.3.7.2 If it is defined in the MDOM where regulation and contingency reserve schedules cannot be awarded at the same time for a resource, then the MDOM will choose the most optimal reserve category the resource should be scheduled at, in consideration of the optimization objective defined in the MDOM.</u></b>  <b><u>4.3.7.3 Different ramping constraints when operating in different modes of operation (e.g., automatic generation control, governor control mode).</u></b>	Provided details on implementation of scheduling for multiple services in compliance with Section 3.1.1.3 of DC2021-03-0009

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Title	Clause	Provision	Proposed Amendment	Rationale
APPENDIX F – OVERVIEW OF THE CO-OPTIMIZATION OF ENERGY AND RESERVE	(new)	(new)	 	To provide sample illustration and calculation



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Title	Clause	Provision	Proposed Amendment	Rationale																																																						
			<div> <h3>Decentralized Scheduling of Capacities</h3> <p>After obtaining the reserve schedules a day ahead...</p> <table border="1"> <thead> <tr> <th rowspan="2">Generator</th> <th rowspan="2">P<sub>max</sub>, MW</th> <th rowspan="2">Reserve Schedule, MW</th> <th colspan="2">Energy Offer</th> </tr> <tr> <th>Quantity, MW</th> <th>Price, P/MWh</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>400.0</td> <td>0.0</td> <td>400.0</td> <td>0.0</td> </tr> <tr> <td>B</td> <td>300.0</td> <td>100.0</td> <td>200.0</td> <td>2,000.0</td> </tr> <tr> <td>C</td> <td>200.0</td> <td>100.0</td> <td>100.0</td> <td>5,000.0</td> </tr> <tr> <td>D</td> <td>300.0</td> <td>0.0</td> <td>300.0</td> <td>12,000.0</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>Generators will then offer their remaining capacities in the real-time energy market.</li> <li>Those with no bilateral contracts for energy would normally attempt to maximize their earnings in the energy market.</li> </ul> <p>Suppose that the Energy Requirement (ERE) is 800 MW. The marginal price is P12,000/MWh.</p> </div> <div> <h3>Co-Optimization: Simultaneous Scheduling</h3> <p>...and such capacities may be fully scheduled to provide energy. Generators should offer the capacity they are willing to set aside for reserve.</p> <p>All capacities should be reflected in a joint market.</p> <table border="1"> <thead> <tr> <th rowspan="2">Generator</th> <th rowspan="2">P<sub>max</sub>, MW</th> <th rowspan="2">Energy Offer Price, P/MWh</th> <th colspan="2">Reserve Offer</th> </tr> <tr> <th>Quantity, MW</th> <th>Price, P/MWh</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>400.0</td> <td>0.0</td> <td>--</td> <td>--</td> </tr> <tr> <td>B</td> <td>300.0</td> <td>2,000.0</td> <td>100.0</td> <td>1,000.0</td> </tr> <tr> <td>C</td> <td>200.0</td> <td>5,000.0</td> <td>200.0</td> <td>3,000.0</td> </tr> <tr> <td>D</td> <td>300.0</td> <td>12,000.0</td> <td>300.0</td> <td>2,000.0</td> </tr> </tbody> </table> <p>Total Requirement (Energy + Reserve)</p> <p>Energy only</p> <p>Reserve</p> <p>Remaining requirement for reserve</p> <p>Thinking was... so that D could provide reserve for energy</p> </div>	Generator	P <sub>max</sub> , MW	Reserve Schedule, MW	Energy Offer		Quantity, MW	Price, P/MWh	A	400.0	0.0	400.0	0.0	B	300.0	100.0	200.0	2,000.0	C	200.0	100.0	100.0	5,000.0	D	300.0	0.0	300.0	12,000.0	Generator	P <sub>max</sub> , MW	Energy Offer Price, P/MWh	Reserve Offer		Quantity, MW	Price, P/MWh	A	400.0	0.0	--	--	B	300.0	2,000.0	100.0	1,000.0	C	200.0	5,000.0	200.0	3,000.0	D	300.0	12,000.0	300.0	2,000.0	
Generator	P <sub>max</sub> , MW	Reserve Schedule, MW	Energy Offer																																																							
			Quantity, MW	Price, P/MWh																																																						
A	400.0	0.0	400.0	0.0																																																						
B	300.0	100.0	200.0	2,000.0																																																						
C	200.0	100.0	100.0	5,000.0																																																						
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Generator	P <sub>max</sub> , MW	Energy Offer Price, P/MWh	Reserve Offer																																																							
			Quantity, MW	Price, P/MWh																																																						
A	400.0	0.0	--	--																																																						
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**B. WESM Manual on Price Determination Methodology**

Title	Clause	Provision	Proposed Amendment	Rationale																																	
			<div> <h3>Co-Optimization: Simultaneous Scheduling</h3> <p><b>Sequential Clearing</b></p> <table border="1"> <thead> <tr> <th rowspan="2">Generator</th> <th colspan="2">Schedules, MWh</th> </tr> <tr> <th>Energy</th> <th>Reserve</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>400.0</td> <td>0.0</td> </tr> <tr> <td>B</td> <td>200.0</td> <td>100.0</td> </tr> <tr> <td>C</td> <td>150.0</td> <td>100.0</td> </tr> <tr> <td>D</td> <td>50.0</td> <td>0.0</td> </tr> </tbody> </table> <p>Resulted to a much more expensive marginal price of P12,000/MWh for energy</p> </div> <div> <p><b>Simultaneous Clearing</b></p> <table border="1"> <thead> <tr> <th rowspan="2">Generator</th> <th colspan="2">Schedules, MWh</th> </tr> <tr> <th>Energy</th> <th>Reserve</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>400.0</td> <td>0.0</td> </tr> <tr> <td>B</td> <td>200.0</td> <td>100.0</td> </tr> <tr> <td>C</td> <td>200.0</td> <td>90.0</td> </tr> <tr> <td>D</td> <td>0.0</td> <td>10.0</td> </tr> </tbody> </table> <p>Energy Price = P5,500/MWh Cost to Produce Cheapest Central Cost Reserve Price = P3,500/MWh</p> <p>Even if the co-optimized solution scheduled a much more expensive resource for reserve (P3,500/MWh)</p> <p>Overall however, the cost was lower as it resulted to a cheaper marginal price of P5,000/MWh for energy</p> </div>	Generator	Schedules, MWh		Energy	Reserve	A	400.0	0.0	B	200.0	100.0	C	150.0	100.0	D	50.0	0.0	Generator	Schedules, MWh		Energy	Reserve	A	400.0	0.0	B	200.0	100.0	C	200.0	90.0	D	0.0	10.0
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### Zonal Scheduling and Pricing



**Scheduling**

Region	Requirement	Reserve Offer	Reserve Schedule	Surplus/Deficit (+/-)
Luzon	647	1000	647	353
Visayas	100	80	80	-20
Mindanao	135	150	135	15

Although Luzon and Visayas are interconnected through the HVDC, the surplus of reserve providers in Luzon will **not be scheduled** above its requirement to provide the deficit in Visayas

**Pricing**

- For each reserve type in each reserve region, different zonal prices shall be obtained, which is already inclusive of the clearing price and the opportunity cost



**B. WESM Manual on Price Determination Methodology**

Title	Clause	Provision	Proposed Amendment	Rationale																																																																
			<p><b>Prioritization of Capacities (as of November 2021)</b></p> <table border="1"> <thead> <tr> <th>Priority</th> <th>Constraint Violation Coefficient Name</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Thermal Constraint of Equipment</td> </tr> <tr> <td>2</td> <td>Regulating Reserve</td> </tr> <tr> <td>3</td> <td>N-1 Contingency Constraint</td> </tr> <tr> <td>4</td> <td>Curtailment of Self-Scheduled Generators</td> </tr> <tr> <td>5</td> <td>System-wide Supply Surplus/Deficit</td> </tr> <tr> <td>6</td> <td>Nodal Load Shedding</td> </tr> <tr> <td>7</td> <td>Contingency Reserve</td> </tr> <tr> <td>8</td> <td>Dispatchable Reserve</td> </tr> </tbody> </table> <p><b>Prioritization of Capacities</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> In the previous CVC Priority Order, the non-violation of the nodal energy requirement constraint is of lower priority than having a deficit in regulation reserve</li> <li><input type="checkbox"/> Thus, the reserve offers shall be maximized to fulfill the reserve requirement</li> <li><input type="checkbox"/> Note that automatic pricing re-run shall be activated</li> </ul> <p>Should the forecasted energy requirement be 1020 MW, while the regulation reserve requirement is 40 MW:</p> <table border="1"> <thead> <tr> <th rowspan="2">GEN</th> <th rowspan="2">PMA, MW</th> <th rowspan="2">ENERGY OFFER PRICE, P/HR</th> <th colspan="2">RESERVE OFFER</th> <th colspan="2">SCHEDULES, MW</th> </tr> <tr> <th>QUANTITY, MW</th> <th>PRICE, P/HR</th> <th>ENERGY</th> <th>RESERVE</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>250</td> <td>2300</td> <td>--</td> <td>--</td> <td>250</td> <td>0</td> </tr> <tr> <td>B</td> <td>230</td> <td>6300</td> <td>180</td> <td>1,300</td> <td>180</td> <td>40</td> </tr> <tr> <td>C</td> <td>240</td> <td>10,000</td> <td>90</td> <td>10,000</td> <td>240</td> <td>0</td> </tr> <tr> <td>D</td> <td>300</td> <td>10,000</td> <td>180</td> <td>12,000</td> <td>360</td> <td>0</td> </tr> <tr> <td colspan="5" style="text-align: center;">Total</td> <td>990</td> <td>40</td> </tr> </tbody> </table>	Priority	Constraint Violation Coefficient Name	1	Thermal Constraint of Equipment	2	Regulating Reserve	3	N-1 Contingency Constraint	4	Curtailment of Self-Scheduled Generators	5	System-wide Supply Surplus/Deficit	6	Nodal Load Shedding	7	Contingency Reserve	8	Dispatchable Reserve	GEN	PMA, MW	ENERGY OFFER PRICE, P/HR	RESERVE OFFER		SCHEDULES, MW		QUANTITY, MW	PRICE, P/HR	ENERGY	RESERVE	A	250	2300	--	--	250	0	B	230	6300	180	1,300	180	40	C	240	10,000	90	10,000	240	0	D	300	10,000	180	12,000	360	0	Total					990	40	
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**B. WESM Manual on Price Determination Methodology**

Title	Clause	Provision	Proposed Amendment	Rationale																																																			
			<div style="background-color: #e1eef6; padding: 5px;"> <p><b>Competing Generators and Loads</b></p> <ul style="list-style-type: none"> <li>❑ Loads should be able to compete with generators in the provision of certain reserve types</li> <li>❑ But for loads to be able to compete with generators in these reserve types, they must also submit bids in the energy market (i.e., demand-side bidding)</li> <li>❑ The MMS is currently designed to accommodate demand-side bidding, but is not yet implemented in WESM</li> <li>❑ The MMS design reflects a co-optimization of energy and reserve for both generators and loads</li> </ul> </div> <div style="background-color: #e1eef6; padding: 5px;"> <p><b>Competing Generators and Loads</b></p> <p>Let us consider the following example: Demand = 400 MW (Reserve Requirement = 55 MW)</p> <table border="1"> <thead> <tr> <th rowspan="2">Generator Offer</th> <th rowspan="2">Price, \$/MWh</th> <th rowspan="2">Max. MW</th> <th colspan="2">Offer Price, \$/MWh</th> </tr> <tr> <th>Energy</th> <th>Reserve</th> </tr> </thead> <tbody> <tr> <td>GEN A</td> <td>200.0</td> <td>200.0</td> <td>200.0</td> <td>0.0</td> </tr> <tr> <td>GEN B</td> <td>400.0</td> <td>100.0</td> <td>0.0</td> <td>100.0</td> </tr> </tbody> </table>   <table border="1"> <thead> <tr> <th rowspan="2">Demand Side</th> <th rowspan="2">Price, \$/MWh</th> <th rowspan="2">Max. MW</th> <th colspan="2">Offer Price, \$/MWh</th> </tr> <tr> <th>Energy</th> <th>Reserve</th> </tr> </thead> <tbody> <tr> <td>LOAD</td> <td>30.0</td> <td>30.0</td> <td>300.0</td> <td>100.0</td> </tr> </tbody> </table>   <table border="1"> <thead> <tr> <th rowspan="2">Resource</th> <th rowspan="2">Price, \$/MWh</th> <th colspan="2">Schedule</th> </tr> <tr> <th>Energy</th> <th>Reserve</th> </tr> </thead> <tbody> <tr> <td>GEN A</td> <td>200.0</td> <td>200.0</td> <td>0.0</td> </tr> <tr> <td>GEN B</td> <td>400.0</td> <td>0.0</td> <td>100.0</td> </tr> <tr> <td>LOAD</td> <td>30.0</td> <td>30.0</td> <td>0.0</td> </tr> <tr> <td>OTHER RESOURCES</td> <td>300.0</td> <td>0.0</td> <td>100.0</td> </tr> </tbody> </table> </div>	Generator Offer	Price, \$/MWh	Max. MW	Offer Price, \$/MWh		Energy	Reserve	GEN A	200.0	200.0	200.0	0.0	GEN B	400.0	100.0	0.0	100.0	Demand Side	Price, \$/MWh	Max. MW	Offer Price, \$/MWh		Energy	Reserve	LOAD	30.0	30.0	300.0	100.0	Resource	Price, \$/MWh	Schedule		Energy	Reserve	GEN A	200.0	200.0	0.0	GEN B	400.0	0.0	100.0	LOAD	30.0	30.0	0.0	OTHER RESOURCES	300.0	0.0	100.0	
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**C. WESM Manual on Registration, Suspension and De-Registration Criteria and Procedures, Issue 10.0**

Title	Clause	Provision	Proposed Amendment	Rationale
Categories and Qualifications - Customers	2.5.1.2 b)	b) The following are qualified to register as <i>Customer</i> – <ul style="list-style-type: none"> <li>▪ <b><i>Distribution Utilities</i></b>, including private <i>distribution utilities</i>, <i>electric cooperatives</i> and local government utilities undertaking distribution of electricity.</li> </ul> xxx	b) The following are qualified to register as <i>Customer</i> – <ul style="list-style-type: none"> <li>▪ <b><i>Distribution Utilities</i></b>, including private <i>distribution utilities</i>, <i>electric cooperatives</i> and local government utilities undertaking distribution of electricity.</li> <li>▪ xxx</li> <li>▪ xxx</li> <li>▪ <b><u>System Operator in its capacity as the entity designated for the procurement of reserves through the Ancillary Service Procurement Agreement and WESM for settlement of such transactions pursuant to prevailing rules, regulations and issuances promulgated by the DOE or the ERC. It is provided that the registration of the System Operator as single buyer of reserves traded in the WESM shall be in accordance with the prevailing rules, regulations and issuances of the DOE or the ERC and that not all the technical and legal requirements for registration of Trading Participants as set out in this Section may apply.</u></b></li> </ul>	Registration of the SO as a Customer Trading Participant is consistent with the general principle that all entities transacting in the WESM must register with the Market Operator. This is also in line with the single buyer policy pursuant to Section 1.4 of DOE DC2021-03-0009
Registration of Ancillary Services Providers –	2.6.1.1	2.6.1.1. Persons or entities wishing to register as <i>WESM member</i> under this category must –	2.6.1.1. Persons or entities wishing to register as <i>WESM member</i> under this category must –	<ul style="list-style-type: none"> <li>• Certification by a third-party provider is included as alternative, pursuant to Section 6, DOE DC 2021-03-0009 and to add more clarity in which</li> </ul>

**C. WESM Manual on Registration, Suspension and De-Registration Criteria and Procedures, Issue 10.0**

Title	Clause	Provision	Proposed Amendment	Rationale
Qualifications and Requirements		<p>a) Be certified by the <i>System Operator</i> as qualified to provide ancillary services in accordance with WESM Rules clause 2.3.5.3. .</p> <p>b) Comply with the membership criteria required of <i>Trading Participants</i> and shall be subject to the same requirements set forth in this Manual.</p> <p>c) Comply with the same technical and commercial requirements required of <i>Trading Participants</i>.</p> <p>d) Comply with the technical requirements for Ancillary Service Providers set forth in the Philippine Grid Code and any other relevant documents that the ERC or DOE will promulgate on the provision of Ancillary Services.</p>	<p>a) <b><u>Be registered as a Generation Company or a Customer.</u></b></p> <p>a) <b><u>b) Be certified by the System Operator or any qualified third party ancillary services capability testing entity accredited by the ERC</u></b> as qualified to provide ancillary services in accordance with WESM Rules clause 2.3.5.3.–</p> <p>b) <b><u>c) Comply with the membership criteria required of Trading Participants</u></b> and shall be subject to the same requirements set forth in this Manual.</p> <p>e) <b><u>d) Comply with the same technical and commercial requirements required of Trading Participants.</u></b></p> <p>d) <b><u>e) Comply with the technical requirements for Ancillary Service Providers set forth in the Philippine Grid Code and any other relevant documents that the ERC or DOE will promulgate on the provision of Ancillary Services.</u></b></p> <p><b><u>f) For Generation Companies, only scheduled generating units, battery energy storage systems, and pumped-storage units can be registered as a reserve facility.</u></b></p>	<p>generators are only allowed to provide A/S.</p> <ul style="list-style-type: none"> <li>• In item (f), to exclude self-scheduled generators, which includes intermittent RE resources. Also, the MMS can only have such types of generators offer reserve capacities. Self-scheduled generators are unable to “clear” the market, even for reserve.</li> <li>• Clerical revisions to update numbering</li> </ul>

**C. WESM Manual on Registration, Suspension and De-Registration Criteria and Procedures, Issue 10.0**

Title	Clause	Provision	Proposed Amendment	Rationale
Registration of Ancillary Services Providers – Qualifications and Requirements	(new)	(new)	<p><b><u>2.6.1.2 The application for registration of a <i>Generation Company as Ancillary Services Provider</i> shall specify the following information for each of its reserve facility which has been issued a valid certification to provide ancillary services:</u></b></p> <ul style="list-style-type: none"> <li>a) <b><u>Reserve category or categories which said generating unit intends to trade in the WESM;</u></b></li> <li>b) <b><u>Maximum reserve capability as determined in the ancillary services capability tests conducted by the System Operator or the third-party testing entity accredited by the ERC. The maximum reserve capability should not exceed the WESM registered maximum capacity (Pmax); and</u></b></li> <li>c) <b><u>Validity period for providing ancillary service for each reserve category.</u></b></li> </ul>	<p>To specify information needed for registration of Ancillary Services provider and to align with Section 3.1.1.3 and 3.3 of DOE DC 2021-03-0009 on allowing schedules for multiple categories and the requirement for reserve providers to offer their maximum reserve capability, respectively.</p>
Registration of Ancillary Services Providers – Qualifications and Requirements	(new)	(new)	<p><b><u>2.6.1.3 Customers with load facilities which intend to register in the WESM as <i>Ancillary Services Provider</i> shall be accredited and comply with the requirements set out in relevant procedures for accreditation promulgated by the ERC. They must submit the following information:</u></b></p> <ul style="list-style-type: none"> <li>a) <b><u>Projected Maximum Energy Load Requirement</u></b></li> </ul>	<p>Registration of load facilities is allowed under Section 5.1, DOE DC2021-03-0009 but subject to accreditation procedures that will be issued by the ERC.</p>

**C. WESM Manual on Registration, Suspension and De-Registration Criteria and Procedures, Issue 10.0**

Title	Clause	Provision	Proposed Amendment	Rationale
			<p><b><u>b) Reserve category or categories which said load facility intends to trade in the WESM;</u></b></p> <p><b><u>c) Maximum reserve capability as determined in the ancillary services capability tests conducted by System Operator or the third-party testing entity accredited by the ERC; and</u></b></p> <p><b><u>d) Validity period for providing ancillary service for each reserve category.</u></b></p>	
Facility Related Changes – Registered Capacities	3.3.1	<p><b>3.3.1. Registered Capacities</b></p> <p>Changes in the registered capacities (i.e., Pmin or Pmax) of a generating unit shall require confirmation by the <i>Market Operator</i> before such change can be considered in the WESM scheduling and dispatch processes.</p>	<p><b>3.3.1. Registered Capacities <u>and Reserve Capabilities</u></b></p> <p>Changes in the registered capacities (i.e., Pmin or Pmax) of a generating unit <b><u>and its maximum reserve capabilities, if there is any,</u></b> shall require confirmation by the <i>Market Operator</i> before such change can be considered in the WESM scheduling and dispatch processes.</p>	Generalized terminologies to allow inclusion of load facilities as reserve providers pursuant to Section 5.1 of DOE DC2021-03-0009
Facility Related Changes – Ancillary Services capability	(new)	(new)	<p><b><u>3.3.8 Ancillary Services Category and Capability</u></b></p>	Allow changes in AS capability/category in line with periodic AS capability testing conducted by NGCP
Facility Related Changes –	(new)	(new)	<p><b><u>3.3.8.1 A WESM Member that is registered as an Ancillary Services Provider may update the registered capability or reserve category of any of its registered reserve facility.</u></b></p> <p><b><u>3.3.8.2 The WESM Member shall comply with the technical requirements set out in Section 2.6.1, including but not</u></b></p>	

**C. WESM Manual on Registration, Suspension and De-Registration Criteria and Procedures, Issue 10.0**

Title	Clause	Provision	Proposed Amendment	Rationale
Ancillary Services capability			<b><u>limited to the submission of the certification of the result of the ancillary services capability test carried out by the System Operator or a third-party entity duly accredited by the ERC.</u></b>	
Facility Related Changes – Ancillary Services capability	(new)	(new)	<b><u>3.3.8.3 The Market Operator shall assess and approve the request for the change in registered capability or reserve category in accordance with the procedures under Section 2.6.2.</u></b>	
Facility Related Changes – Ancillary Services capability	(new)	(new)	<p><b><u>3.3.8.4 If a reserve facility’s validity period for providing ancillary service in a specific reserve category is about to expire, then the Market Operator shall inform the Ancillary Services Provider and the System Operator that the relevant reserve facility shall be de-registered for the affected specific reserve category at least ninety (90) calendar days prior to the expiration of its validity period. Updated certification may include a letter of extension from the System Operator.</u></b></p> <p><b><u>a) The Market Operator shall not proceed with the de-registration of the reserve category if the Ancillary Services Provider is able to provide an updated certification of the result of the ancillary services capability test carried out by the System Operator or</u></b></p>	Proposed Section 3.3.8.4 also considers cases where AS certificates are extended by NGCP. If a generator has completed its AS testing, NGCP usually extends the validity of the AS certificate, while waiting for the release of the official document. IEMOP should consider as valid date, the extended AS certificate.

**C. WESM Manual on Registration, Suspension and De-Registration Criteria and Procedures, Issue 10.0**

Title	Clause	Provision	Proposed Amendment	Rationale
			<p><u>a third-party entity duly accredited by the ERC at least seven (7) calendar days prior to the original expiration of its validity period. The Market Operator shall inform the System Operator if the de-registration shall not proceed.</u></p> <p><u>b) Should the Ancillary Services Provider is unable to provide an updated certification of the result of the ancillary services capability test carried out by the System Operator or a third-party entity duly accredited by the ERC within the aforementioned timeline, the Market Operator shall effectively de-register the specific reserve category for that reserve facility effective on the original expiration of its validity period. The Market Operator shall inform the System Operator of the de-registration.</u></p>	
Glossary of Terms	Appendix A	(new)	<u>Maximum reserve capability – The maximum demand in MW that a facility can provide with respect to reserves based on ancillary service capability tests.</u>	To provide definition of maximum reserve capability which is mentioned in Section 2.6.1.2.

D. WESM Manual on Billing and Settlement Issue 8.0				
Title	Clause	Provision	Proposed Amendment	Rationale
Responsibilities – Trading Participants	3.2	<p><b>3.2 TRADING PARTICIPANTS</b></p> <p>The Trading Participants shall be responsible for complying with the requirements set forth in this Market Manual and in the WESM Rules, as follows:</p> <p>a) Retrieve and review settlement statement files and supporting data issued by the Market Operator. The Trading Participants shall notify the Market Operator if files are not accessible or received within the timetable and if there are discrepancies or errors;</p> <p>b) xxx</p> <p>c) xxx</p> <p>d) xxx</p> <p>e) xxx</p>	<p><b>3.2 TRADING PARTICIPANTS <u>WESM MEMBERS</u></b></p> <p><b><u>WESM Members, including</u></b> <del>The Trading Participants</del> <b><u>and the System Operator,</u></b> shall be responsible for complying with the requirements set forth in this Market Manual and in the WESM Rules, as follows:</p> <p>a) Retrieve and review settlement statement files and supporting data issued by the Market Operator. The Trading Participants <b><u>or the System Operator</u></b> shall notify the Market Operator if files are not accessible or received within the timetable and if there are discrepancies or errors;</p> <p>b) xxx</p> <p>c) xxx</p> <p>d) xxx</p> <p>e) xxx</p>	<ul style="list-style-type: none"> <li>Revised to specify System Operator as a billing entity pursuant to Section 1.4 of DC2021-03-0009.</li> <li>As defined in the WESM Rules Section 2.3, WESM Members include Trading Participants and the SO while Trading Participants only pertain to Generation Companies and Customers.</li> </ul>
Contents of Settlement Statements and Data – Settlement Quantity and Amounts	4.1.1	b) The trading amount billed to each Trading Participant is in accordance to WESM Rules Clauses 3.13.17 and 3.13.18.	<del>b) The trading amount billed to each Trading Participant is in accordance to WESM Rules Clauses 3.13.17 and 3.13.18.</del>	Deleted since WESM Rules Clauses 3.13.17 and 3.13.18 does not exist and to avoid redundancy with 4.1.1 e) i - ii
Contents of Settlement Statements	4.1.1	c) The reserve cost recovery charge billed to each Trading Participant is in accordance to WESM Rules Clause 3.13.9	<del>c) The reserve cost recovery charge billed to each Trading Participant is in accordance to WESM Rules Clause 3.13.9</del>	Deleted to comply with DC2021-03-0009 provision that SO is the single

D. WESM Manual on Billing and Settlement Issue 8.0				
Title	Clause	Provision	Proposed Amendment	Rationale
and Data – Settlement Quantity and Amounts				buyer for reserves thus, no reserve cost recovery charges are to be billed to a Trading Participant.
Contents of Settlement Statements and Data – Settlement Quantity and Amounts	4.1.1	d) The transmission rights trading amount billed to each Trading Participant is in accordance to WESM Rules Clause 3.13.10	<del>e) The transmission rights trading amount billed to each Trading Participant is in accordance to WESM Rules Clause 3.13.10</del>	Deleted to avoid redundancy with 4.1.1 e) iii
Contents of Settlement Statements and Data – Settlement Quantity and Amounts	4.1.1	e) The aggregate trading amount for a Trading Participant for a trading interval equals the sum of:  xxx  iv. The reserve cost recovery charge determined for that Trading Participant with respect to any reserve cost recovery zone within which it has any facility connected calculated in accordance with the procedures developed under WESM Rules Clause 3.3.5 (which will be positive for any Trading Participant); and  v. Any other ancillary service cost recovery charges determined for that Trading Participant in accordance with the procedures developed under WESM Rules Clause 3.3.5.	e) <del>b)</del> The aggregate trading amount for a Trading Participant for a trading interval equals the sum of:  xxx  <del>iv. The reserve cost recovery charge determined for that Trading Participant with respect to any reserve cost recovery zone within which it has any facility connected calculated in accordance with the procedures developed under WESM Rules Clause 3.3.5 (which will be positive for any Trading Participant); and</del>  <del>v. Any other ancillary service cost recovery charges determined for that Trading Participant in accordance with the procedures developed under WESM Rules Clause 3.3.5.</del>	Deleted to comply with DC2021-03-0009 provision that SO is the single buyer for reserves thus, no reserve cost recovery charges are to be billed to a Trading Participant.
Contents of Settlement	4.1.1	f) For each billing period, the Market Operator shall determine the settlement amount for each Trading Participant as the sum of the aggregate trading	<del>f) c)</del> For each billing period, the Market Operator shall determine the settlement amount for each Trading Participant as the sum of the aggregate trading	• Deleted to comply with DC2021-03-0009

<b>D. WESM Manual on Billing and Settlement Issue 8.0</b>				
<b>Title</b>	<b>Clause</b>	<b>Provision</b>	<b>Proposed Amendment</b>	<b>Rationale</b>
Statements and Data – Settlement Quantity and Amounts		<p>amounts for the settlement intervals in that billing period, determined in accordance with WESM Rules 3.13.11.2 plus:</p> <p style="text-align: center;">xxx</p> <p>iii. Any other amounts payable by that Trading Participant to the Market Operator in respect of that billing period, including any reserves recovery charges.</p>	<p>amounts for the settlement intervals in that billing period, determined in accordance with WESM Rules 3.13.11.2 plus:</p> <p style="text-align: center;">xxx</p> <p>iii. Any other amounts payable by that Trading Participant to the Market Operator in respect of that billing period, <del>including any reserves recovery charges.</del></p> <p><b><u>iv. It is provided, however, that the Market Operator may issue a separate settlement statement for the reserve trading amounts, if applicable, for that Trading Participant.</u></b></p>	<p>provision that SO is the single buyer for reserves thus, no reserve cost recovery charges are to be billed to a Trading Participant.</p> <ul style="list-style-type: none"> <li>This is to allow for the separate payments of reserve trading amounts - and not be mingled with payments for energy trading amounts. This is to ensure that the payments by the System Operator for reserve transactions shall be paid in full to the A/S providers.</li> </ul>
Contents of Settlement Statements and Data – Settlement Quantity and Amounts	4.1.1	(new)	<p><b><u>d) The aggregate trading amount for the System Operator for a settlement interval equals the total reserve cost recovery amount with respect to every reserve category and reserve region in accordance with WESM Rules Clause 3.13.9.</u></b></p>	<p>Added to comply with Section 1.4 of DC2021-03-0009 provision that SO is the single buyer for reserves, thus it shall be billed the total reserve cost recovery amount.</p>

<b>D. WESM Manual on Billing and Settlement Issue 8.0</b>				
<b>Title</b>	<b>Clause</b>	<b>Provision</b>	<b>Proposed Amendment</b>	<b>Rationale</b>
Contents of Settlement Statements and Data – Settlement Quantity and Amounts	4.1.1	(new)	<b><u>e) For each billing period, the Market Operator shall determine the settlement amount for the System Operator as the sum of the aggregate reserve cost recovery amounts for the settlement intervals in that billing period, determined in accordance with WESM Rules Clause 3.13.11.5.</u></b>	Added to comply with Section 1.4 DC2021-03-0009 provision that SO is the single buyer for reserves, thus it shall be billed the total reserve cost recovery amount.
Contents of Settlement Statements and Data	4.1.4	The settlement data that are being transmitted to the Trading Participants along with the preliminary and final statements including the market fee statements which includes the energy trading amounts, final nodal energy dispatch prices, energy settlement quantity, line rental trading amount of participants with bilateral contract quantity and each of the participants' bilateral contract quantity, reserve trading amount, reserve recovery amount, net settlement surplus rebated, and line loss and congestion charges. These set of information are being transmitted to the Trading Participants via email and CD copy mailed along with the Participant's Statements.	The <b><u>Market Operator shall provide by electronic means to the Trading Participants their respective settlement data that are being transmitted to the Trading Participants along with the preliminary and final statements, which settlement data shall include, as may be applicable,</u></b> including the market fee statements, <del>which includes the energy trading amounts, final nodal energy dispatch prices, energy settlement quantity, line rental trading amount of participants with bilateral contract quantity and each of the participants' bilateral contract quantity, final reserve prices, reserve trading amount, reserve recovery amount</del> net settlement surplus rebated, and line loss and congestion charges. <del>These set of information are being transmitted to the Trading Participants via email and CD copy mailed along with the Participant's Statements.</del>	<ul style="list-style-type: none"> <li>• Revised to include information on final reserve prices and to delete the reserve recovery amount.</li> <li>• Revised the provision to align with current practice of sending data and statements via the CRSS.</li> </ul>
Contents of Settlement Statements and Data	(new)	(new)	<b><u>4.1.5 The Market Operator shall provide by electronic means to the System Operator its settlement data, along with the preliminary and final statements, which settlement data shall include, as applicable, the market fee statements, reserve cost recovery amounts, final reserve prices, reserve quantities and reserve bilateral contract quantities.</u></b>	<ul style="list-style-type: none"> <li>• Added to specify set of information to be transmitted to SO and align with current practice of sending data and statements via the CRSS.</li> </ul>

D. WESM Manual on Billing and Settlement Issue 8.0				
Title	Clause	Provision	Proposed Amendment	Rationale
PROCEDURE S-Payment by Trading Participant	5.3.1	Payment by Trading Participant  xxx	Payment by <del>Trading Participant</del> <b><u>WESM Member</u></b>  xxx	<ul style="list-style-type: none"> <li>Revised since WESM Member is the more appropriate term.</li> <li>As defined in the WESM Rules Section 2.3, WESM Members include Trading Participants and the SO while Trading Participants only pertain to Generation Companies and Customers.</li> </ul>
PROCEDURE S-Payment to the Trading Participant	5.3.2	Payment to the Trading Participant  xxx	Payment to the <del>Trading Participant</del> <b><u>WESM Member</u></b>  xxx	<ul style="list-style-type: none"> <li>Revised since WESM Member is the more appropriate term.</li> <li>As defined in the WESM Rules Section 2.3, WESM Members include Trading Participants and the SO while Trading Participants only pertain to Generation</li> </ul>

D. WESM Manual on Billing and Settlement Issue 8.0				
Title	Clause	Provision	Proposed Amendment	Rationale
				Companies and Customers.
PROCEDURE S-Default	6.2.1. e)	e) The Trading Participant shall remit the overdue amount to the Market Operator. Such overdue amount shall bear the default interest rate reckoned from the first day such amount is due and payable, up to and including the date on which payment is made, with interest computed based on a 360-day year. The default interest rate is equivalent to the BSP lending rate on date of payment plus 3% will accrue to the remaining unpaid amount until the full payment is received.	e) The <del>Trading Participant</del> <b>WESM Member</b> shall remit the overdue amount to the Market Operator. Such overdue amount shall bear the default interest rate reckoned from the first day such amount is due and payable, up to and including the date on which payment is made, with interest computed based on a 360-day year. The default interest rate is equivalent to the BSP lending rate on date of payment plus 3% will accrue to the remaining unpaid amount until the full payment is received.	For consistency in the terms used.
PROCEDURE S-Default	6.2.1	f) The amount collected from the defaulting Trading Participant, including the default interest, shall be paid by the Market Operator to the Trading Participants in accordance with Section 5.3.2 of this Manual.	f) The amount collected from the defaulting <b>WESM Member</b> <del>Trading Participant</del> , including the default interest, shall be paid by the Market Operator to the <b>WESM Members</b> <del>Trading Participants</del> in accordance with Section 5.3.2 of this Manual.	For consistency in the terms used.
PROVISION OF SECURITY	7.2.4	7.2.4 If, under Section 7.2.2 of this Manual, the Market Operator has exempted a Trading Participant from the requirement to provide a security for a period; then the Market Operator shall not set a Trading Limit for that WESM Member for that period during which that exemption applies.	7.2.4 If, under Section 7.2.2 of this Manual, the Market Operator has exempted a <del>Trading Participant</del> <b>WESM Member</b> from the requirement to provide a security for a period; then the Market Operator shall not set a Trading Limit for that WESM Member for that period during which that exemption applies.	For consistency in the terms used.
Initial Assessment of Prudential Requirements	7.4.1	b) The projected <i>settlement amount</i> for each <i>billing period</i> of a <i>WESM Member</i> shall be calculated using the following formula: $PSA = \sum_{i \in I} (PGESQ_i \times PFEDP_i)$	b) The projected <i>settlement amount</i> for each <i>billing period</i> of a <i>WESM Member</i> shall be calculated using the following formula: $PSA = \sum_{i \in I} (PGESQ_i \times PFEDP_i)$	Updated PSA formula to consider reserve transactions

D. WESM Manual on Billing and Settlement Issue 8.0				
Title	Clause	Provision	Proposed Amendment	Rationale
		$- \sum_{i \in I} \sum_{c \in C} (PBCQ_{c,i} \times PFEDP_{c,i})$ <p>Where:</p> <p>PSA projected <i>settlement amount</i> in PhP</p> <p>PGESQ<sub>i</sub> projected <i>gross energy settlement quantity for energy</i>, in MWh, for <i>dispatch interval i</i></p> <p>PFEDP<sub>i</sub> projected <i>final energy dispatch price for energy</i>, in PhP/MWh, for <i>dispatch interval i</i></p> <p>PBCQ<sub>c,i</sub> projected <i>bilateral contract quantity for energy</i>, in MWh, from counterparty c for <i>dispatch interval i</i></p> <p>PFEDP<sub>c,i</sub> projected <i>final energy dispatch price for energy</i>, in PhP/MWh, associated with the <i>bilateral contract</i> with counterparty c for <i>dispatch interval i</i></p> <p>I set of <i>dispatch intervals</i> within the billing period</p> <p>C set of counterparties</p>	$- \sum_{i \in I} \sum_{c \in C} (PBCQ_{c,i} \times PFEDP_{c,i})$ $PSA = \sum_{i \in I} (PQ_i \times P_i)$ $- \sum_{i \in I} \sum_{c \in C} (PBCQ_{c,i} \times P_{c,i})$ <p>Where:</p> <p>PSA projected <i>settlement amount</i> in PhP</p> <p>PGESQ<sub>i</sub>, <b>PQ<sub>i</sub></b> <b>either</b> projected <i>gross energy settlement quantity for energy</i>, in MWh, <b>or</b> <b>projected reserve quantity</b> for <i>dispatch interval i</i></p> <p>PFEDP<sub>i</sub>, <b>P<sub>i</sub></b> <b>either</b> projected <i>final energy dispatch price for energy</i>, <b>or</b> <b>projected reserve price</b> in PhP/MWh, for <i>dispatch interval i</i></p> <p>PBCQ<sub>c,i</sub> <b>either</b> projected <i>bilateral contract quantity for energy</i> <b>or</b> <b>projected reserve bilateral contract quantity</b>, in MWh, from counterparty c for <i>dispatch interval i</i></p> <p>PFEDP<sub>c,i</sub>, <b>P<sub>c,i</sub></b> <b>either</b> projected <i>final energy dispatch price for energy</i> <b>or</b> <b>projected reserve price</b>, in PhP/MWh, associated with the <i>bilateral contract</i> with counterparty c for <i>dispatch interval i</i></p> <p>I set of <i>dispatch intervals</i> within the billing period</p> <p>C set of counterparties</p>	
Initial Assessment	7.4.1	(new)	<b><u>c) The System Operator's compliance on prudential requirement shall be subject to ERC approval.</u></b>	Provided new section for the compliance of

D. WESM Manual on Billing and Settlement Issue 8.0					
Title	Clause	Provision		Proposed Amendment	Rationale
of Prudential Requirements					System Operator with the prudential requirement based on ERC's directives.
BILLING AND SETTLEMENT TIMETABLE	Section 12 Appendix A	<b>Payment by Trading Participants</b>	No later than 3.00 pm on the twenty-fifth day of the calendar month following the billing period. If the twenty-fifth day of the calendar month following the billing period falls on a <i>Non-Working Day</i> , the payment due date shall be moved to the next immediate <i>Working Day</i> .	<b>Payment by Trading Participants <u>WESM Members</u></b>	No later than 3.00 pm on the twenty-fifth day of the calendar month following the billing period. If the twenty-fifth day of the calendar month following the billing period falls on a <i>Non-Working Day</i> , the payment due date shall be moved to the next immediate <i>Working Day</i> .
		<b>Payment to Trading Participants</b>	On the following <i>Working Day</i> after the <i>Market Operator</i> is to be paid by Trading Participants.	<b>Payment to Trading Participants <u>WESM Members</u></b>	On the following <i>Working Day</i> after the <i>Market Operator</i> is to be paid by Trading Participants <u>WESM Members</u> .
		<b>Payment of Adjustments by Trading Participants</b>	By no later than the time and date specified by <i>the Market Operator</i> , which date shall be not less than ten <i>business days</i> and not more than fifteen <i>business days</i> after the issue of that revised statement	<b>Payment of Adjustments by Trading Participants <u>WESM Members</u></b>	By no later than the time and date specified by <i>the Market Operator</i> , which date shall be not less than ten <i>business days</i> and not more than fifteen <i>business days</i> after the issue of that revised statement
		<b>Payment of Adjustments to Trading Participants</b>	On the following <i>Working Day</i> on which the <i>Market Operator</i> is	<b>Payment of Adjustments to Trading Participants <u>WESM Members</u></b>	On the following <i>Working Day</i> on which the <i>Market Operator</i> is to be paid by the Trading Participants <u>WESM Members</u> of the adjustments.

D. WESM Manual on Billing and Settlement Issue 8.0					
Title	Clause	Provision		Proposed Amendment	Rationale
			to be paid by the Trading Participants of the adjustments.	<u>sWESM Members</u>	

E. WESM Manual on Dispatch Protocol, Issue 16.0				
Title	Clause	Provision	Proposed Amendment	Rationale
Overview of WESM Operations	1.1.1	In the <i>WESM</i> , the <i>Market Operator</i> provides the <i>System Operator</i> with <i>dispatch schedules</i> to be implemented by the <i>System Operator</i> for each <i>dispatch interval</i> using various inputs such as <i>load forecasts</i> and state-estimated data from the <i>Market Operator</i> , real-time data and <i>security constraints</i> from the <i>System Operator</i> , and <i>demand bids</i> , <i>market offers</i> , and <i>self-scheduled nominations</i> submitted by the <i>Trading Participants</i> .	In the <i>WESM</i> , the <i>Market Operator</i> provides the <i>System Operator</i> with <b><u>energy dispatch and reserve</u></b> schedules to be implemented by the <i>System Operator</i> <b><u>and the Trading Participants</u></b> for each <i>dispatch interval</i> using various inputs such as <i>load forecasts</i> and state-estimated data from the <i>Market Operator</i> , <b><u>reserve requirements</u></b> , real-time data and <i>security constraints</i> from the <i>System Operator</i> , and <i>demand bids</i> , <i>market offers</i> , and <i>self-scheduled nominations</i> submitted by the <i>Trading Participants</i> .	To include reserve schedule dispatch implementation by Trading Participants and required inputs in the dispatch procedures overview
Overview of WESM Operations	1.1.6	The scheduling process starts with the <i>week-ahead projection</i> (WAP) which gives the indicative hourly <i>dispatch schedules</i> and spot prices for the next seven (7) days. This projection takes into consideration all available information including nomination of <i>loading levels</i> , <i>projected outputs</i> , <i>bids</i> and <i>offers</i> from participants, demand forecasts, <i>outage</i> schedules and the current status of the <i>grid</i> .	The scheduling process starts with the <i>week-ahead projection</i> (WAP) which gives the indicative hourly <i>dispatch schedules</i> and spot prices for the next seven (7) days. This projection takes into consideration all available information including nomination of <i>loading levels</i> , <i>projected outputs</i> , <i>bids</i> and <i>offers</i> from participants, demand forecasts, <b><u>reserve requirements</u></b> , <i>outage</i> schedules and the current status of the <i>grid</i> .	To include reserve schedule dispatch implementation in the dispatch procedures overview
Overview of WESM Operations	1.1.11	The <i>System Operator</i> implements the RTD schedules for the <i>dispatch interval</i> , issues <i>dispatch instructions</i> to and ensures compliance by the <i>Trading Participants</i> with such instructions, and maintains overall <i>security</i> of the <i>power system</i> .	The <i>System Operator</i> <b><u>and the Trading Participants</u></b> implements the RTD schedules for the <i>dispatch interval</i> , <b><u>The System Operator</u></b> issues <i>re-dispatch instructions</i> to and ensures compliance by the <i>Trading Participants</i> with such instructions, and maintains overall <i>security</i> of the <i>power system</i> .	To include reserve schedule dispatch implementation by Trading Participants in the dispatch procedures overview
Responsibilities – Market Operator	3.1.1	The <i>Market Operator</i> is responsible for the administration of the Wholesale Electricity Spot Market ( <i>WESM</i> ) in accordance with the <i>WESM Rules</i> . Among other functions, it is responsible for determining the <i>dispatch schedule</i> of all	The <i>Market Operator</i> is responsible for the administration of the Wholesale Electricity Spot Market ( <i>WESM</i> ) in accordance with the <i>WESM Rules</i> . Among other functions, it is responsible for determining the <i>dispatch schedule</i> of all facilities in the <i>WESM</i> , which	To include reserve schedule dispatch implementation

E. WESM Manual on Dispatch Protocol, Issue 16.0				
Title	Clause	Provision	Proposed Amendment	Rationale
		facilities in the <i>WESM</i> , which schedule shall be submitted to the <i>System Operator</i> <sup>7</sup> .	schedule shall be submitted to the <i>System Operator</i> <sup>5</sup> <b>and the <u>Trading Participants</u></b> .	by Trading Participants
Overview of Energy Management Applications	5.2.3	The <i>System Operator</i> shall also submit its <i>over-riding constraint</i> inputs to the MDOM via the Current Operating Plan using the most efficient facility in transferring data to <i>Market Operator</i> .	The <i>System Operator</i> shall also submit its <i>over-riding constraint</i> <b>and <u>reserve requirements</u></b> inputs to the MDOM via the Current Operating Plan using the most efficient facility in transferring data to <i>Market Operator</i> .	To update required inputs for reserve schedule dispatch implementation
Bids, Offers and Data Submissions and Processing – Background	(new)	(new)	<b><u>6.1.6 Trading Participants shall also indicate their expected mode of operations (e.g. <i>automatic generation control, governor control mode</i>) for each reserve category when submitting their reserve offer.</u></b>	To update required inputs for reserve schedule dispatch implementation
Bids, Offers and Data Submissions and Processing – Background	6.1.6	<i>WESM Rules</i> Clause 3.5.11.2 directs <i>Generation Companies</i> that have submitted <i>self-scheduled nomination</i> of their <i>non-scheduled generating units</i> to revise the same if it reasonably expects that any of its anticipated <i>loading levels</i> will differ materially from those previously submitted.	<b><u>6.1.7</u></b> <del>6.1.6</del> <i>WESM Rules</i> Clause 3.5.11.2 directs <i>Generation Companies</i> that have submitted <i>self-scheduled nomination</i> of their <i>non-scheduled generating units</i> to revise the same if it reasonably expects that any of its anticipated <i>loading levels</i> will differ materially from those previously submitted.	Re-numbered
Bids, Offers and Data Submissions and Processing – Background	6.1.7	<i>WESM Rules</i> Clause 3.5.11.5 requires <i>Trading Participants</i> to revise their <i>bids</i> or <i>offers</i> if they no longer represent a reasonable estimate of either the expected <i>availability</i> for the <i>dispatch interval</i> of the relevant <i>generating unit</i> or <i>scheduled load</i> or the <i>demand bids</i> or <i>offers</i> likely to apply in the <i>real-time dispatch</i> optimization for the <i>dispatch interval</i> .	<b><u>6.1.8</u></b> <del>6.1.7</del> <i>WESM Rules</i> Clause 3.5.11.5 requires <i>Trading Participants</i> to revise their <i>bids</i> or <i>offers</i> if they no longer represent a reasonable estimate of either the expected <i>availability</i> for the <i>dispatch interval</i> of the relevant <i>generating unit</i> or <i>scheduled load</i> or the <i>demand bids</i> or <i>offers</i> likely to apply in the <i>real-time dispatch</i> optimization for the <i>dispatch interval</i> .	Re-numbered

<sup>7</sup> *WESM Rules* Clause 1.3.1

E. WESM Manual on Dispatch Protocol, Issue 16.0				
Title	Clause	Provision	Proposed Amendment	Rationale
Bids, Offers and Data Submissions and Processing – Background	6.1.8	Pursuant to <i>WESM Rules</i> Clause 3.5.11.6, <i>Trading Participants</i> that cancel their <i>bids</i> or <i>offers</i> , or submit <i>bids</i> or <i>offers</i> less than the registered capacity or <i>maximum available capacity</i> of their <i>facility</i> or <i>generating unit</i> are required to provide information on the reasons or circumstances of such cancellation or submission.	<del>6.1.8</del> Pursuant to <i>WESM Rules</i> Clause 3.5.11.6, <i>Trading Participants</i> that cancel their <i>bids</i> or <i>offers</i> , or submit <i>bids</i> or <i>offers</i> less than the registered capacity or <i>maximum available capacity</i> of their <i>facility</i> or <i>generating unit</i> are required to provide information on the reasons or circumstances of such cancellation or submission.	Re-numbered
Bids, Offers and Data Submissions and Processing – Background	6.1.9	<i>Trading Participants</i> are also required to immediately notify the <i>System Operator</i> and the <i>Market Operator</i> of any circumstances which threaten a significant probability of material adverse change in the state of their facilities. A non-exhaustive list of events that will be deemed to be or to cause material adverse change is required to be published. In compliance with the foregoing, a non-exhaustive list is provided under Section 6.14 of this <i>Market Manual</i> pursuant to <i>WESM Rules</i> Clause 3.5.11.8.	<del>6.1.9</del> <i>Trading Participants</i> are also required to immediately notify the <i>System Operator</i> and the <i>Market Operator</i> of any circumstances which threaten a significant probability of material adverse change in the state of their facilities. A non-exhaustive list of events that will be deemed to be or to cause material adverse change is required to be published. In compliance with the foregoing, a non-exhaustive list is provided under Section 6.14 of this <i>Market Manual</i> pursuant to <i>WESM Rules</i> Clause 3.5.11.8.	Re-numbered
Bids, Offers and Data Submissions and Processing – Formats and Contents of Submission	6.9.4	6.9.4 <i>Trading Participants</i> shall provide the following information when submitting <i>reserve offers</i> : <ul style="list-style-type: none"> <li>a. A maximum response level for the relevant <i>reserve category</i> (MW);</li> <li>b. A maximum proportion of the forecast/<i>scheduled load</i>, which may be interrupted;</li> <li>c. Up to three (3) <i>reserve offer</i> blocks (MW/block);</li> <li>d. A minimum block size of one (1) MW; and</li> </ul>	6.9.4 <i>Trading Participants</i> shall provide the following information when submitting <i>reserve offers</i> : <ul style="list-style-type: none"> <li>a. A maximum response level for the relevant <i>reserve category</i> (MW);</li> <li><b>b. <u>Control mode of operations</u></b></li> <li><del>b.c.</del> A maximum proportion of the forecast/<i>scheduled load</i>, which may be interrupted;</li> <li><del>c.d.</del> Up to three (3) <i>reserve offer</i> blocks (MW/block);</li> <li><del>d.e.</del> A minimum block size of one (1) MW; and</li> </ul>	To update required inputs for reserve schedule dispatch implementation  Renumbered.

E. WESM Manual on Dispatch Protocol, Issue 16.0				
Title	Clause	Provision	Proposed Amendment	Rationale
		e. Monotonically increasing prices.	<u>ef.</u> Monotonically increasing prices.	
System Operator Input and Data and Reports - Reserve Requirements	7.8.2	The level of <i>reserve requirement</i> shall be based on the provisions of the <i>Grid Code</i> and the relevant <i>ERC</i> issuances on <i>ancillary services</i> .	The level of <i>reserve requirement</i> shall be based on the provisions of the <i>Grid Code</i> and the relevant <i>ERC</i> issuances on <i>ancillary services</i> <b><u>from the DOE and the ERC.</u></b>	To include DOE issuances as basis for level of reserve requirements
Real-time Dispatch Scheduling - Background	9.1.1	9.1.1 <i>WESM Rules</i> Clause 3.8 sets out the responsibilities of the Market Operator in the scheduling of <i>generation</i> and <i>load</i> in the <i>WESM</i> . Among other responsibilities, <i>WESM Rules</i> Clause 3.8.1 directs that prior to the commencement of each <i>dispatch interval</i> , the <i>Market Operator</i> shall use the <i>market dispatch optimization model (MDOM)</i> to determine the target <i>loading level</i> in MW for each <i>non-scheduled generating unit</i> , <i>must dispatch generating unit</i> , <i>priority dispatch generating unit</i> , <i>scheduled generating unit</i> or each <i>scheduled load</i> and for each <i>reserve facility</i> for the end of the <i>dispatch interval</i> using the latest data from the <i>System Operator</i> and the <i>Trading Participants</i> . The <i>Market Operator</i> shall submit to the <i>System Operator</i> the <i>dispatch schedule</i> containing the <i>target loading levels</i> to be achieved at the end of the <i>dispatch interval</i> .	9.1.1 <i>WESM Rules</i> Clause 3.8 sets out the responsibilities of the <i>Market Operator</i> in the scheduling of <i>generation</i> and <i>load</i> in the <i>WESM</i> . Among other responsibilities, <i>WESM Rules</i> Clause 3.8.1 directs that prior to the commencement of each <i>dispatch interval</i> , the <i>Market Operator</i> shall use the <i>market dispatch optimization model (MDOM)</i> to determine the target <i>loading level</i> in MW for each <i>non-scheduled generating unit</i> , <i>must dispatch generating unit</i> , <i>priority dispatch generating unit</i> , <i>scheduled generating unit</i> or each <i>scheduled load</i> and for each <b>reserve</b> <i>facility</i> for the end of the <i>dispatch interval</i> using the latest data from the <i>System Operator</i> and the <i>Trading Participants</i> .  <b><u>9.1.2</u></b> The <i>Market Operator</i> shall submit to the <i>System Operator</i> <b><u>and the Trading Participants</u></b> the <i>dispatch schedule</i> containing the <i>target loading levels</i> to be achieved at the end of the <i>dispatch interval</i> .	To include reserve schedule dispatch implementation by Trading Participants  Renumbered.
Real-time Dispatch	9.1.2	9.1.2 The <i>WESM Rules</i> defines <i>loading level</i> as the instantaneous level of output or consumption in MW	<b><u>9.1.3</u></b> <del>9.1.2</del> —The <i>WESM Rules</i> defines <i>loading level</i> as the instantaneous level of output or consumption in	Renumbered.

E. WESM Manual on Dispatch Protocol, Issue 16.0				
Title	Clause	Provision	Proposed Amendment	Rationale
Scheduling - Background		of a <i>generating unit</i> or <i>load</i> . The <i>target loading level</i> of a <i>generator</i> or <i>load</i> is the <i>loading level</i> determined as an end-of-period target for that scheduled <i>generator</i> or <i>load</i> .	MW of a <i>generating unit</i> or <i>load</i> . The <i>target loading level</i> of a <i>generator</i> or <i>load</i> is the <i>loading level</i> determined as an end-of-period target for that scheduled <i>generator</i> or <i>load</i> .	
Real-time Dispatch Scheduling - Background	(new)	(new)	<b><u>9.1.4 The Market Operator shall submit to the System Operator and the Trading Participants the reserve schedule containing the capacity that can be used by the System Operator to maintain the frequency of the grid within the limits prescribed by the Grid Code for the entire dispatch interval.</u></b>	To update required information to be provided by IEMOP for reserve schedule dispatch implementation
Real-time Dispatch Scheduling - Background	9.1.3	9.1.3 Additionally, the <i>Market Operator</i> is required under <i>WESM Rules</i> Clause 3.10 to calculate and publish the RTD prices.	<b>9.1.5</b> 9.1.3 Additionally, the <i>Market Operator</i> is required under <i>WESM Rules</i> Clause 3.10 to calculate and publish the RTD prices.	Renumbered.
Real-time Dispatch Scheduling – Responsibilities	9.3.1.c	Preparing and ensuring timely submission to the <i>System Operator</i> of the <i>real-time dispatch schedule</i> , including the <i>WMOT</i> , in preparation for the <i>dispatch</i> implementation as set out in the <i>WESM Rules</i> and this Dispatch Protocol; and	Preparing and ensuring timely submission to the <i>System Operator</i> of the <i>real-time dispatch schedule</i> , including the <b><u>reserve schedules and</u></b> <i>WMOT</i> , in preparation for the <i>dispatch</i> implementation as set out in the <i>WESM Rules</i> and this Dispatch Protocol; and	To update required information to be provided by IEMOP for reserve schedule dispatch implementation
Real-time Dispatch Scheduling – Responsibilities	9.3.3	<i>Trading Participants</i> shall be responsible for: <ul style="list-style-type: none"> <li>a. Ensuring submission of <i>market offers</i> and <i>reserve offers</i> as set out in the <i>WESM Rules</i> and in accordance with the <i>WESM timetable</i> and the procedures and requirements set forth in this Dispatch Protocol.</li> <li>b. For <i>scheduled generating units</i> and <i>priority dispatch generating units</i> who are <i>dispatched</i>,</li> </ul>	<i>Trading Participants</i> shall be responsible for: <ul style="list-style-type: none"> <li>a. Ensuring submission of <i>market offers</i> and <i>reserve offers</i> as set out in the <i>WESM Rules</i> and in accordance with the <i>WESM timetable</i> and the procedures and requirements set forth in this Dispatch Protocol.</li> <li>b. For <i>scheduled generating units</i> and <i>priority dispatch generating units</i> who are <i>dispatched</i>,</li> </ul>	To clarify that Ancillary Service providers are required to conform with reserve schedules. Development of reserve conformance

E. WESM Manual on Dispatch Protocol, Issue 16.0				
Title	Clause	Provision	Proposed Amendment	Rationale
		<p>generating in accordance with the <i>dispatch schedule</i> communicated and within <i>dispatch conformance</i> the <i>standards</i> set forth in this <i>Market Manual</i>.</p> <p>Maintaining their respective infrastructure to ensure access to the Market Participant Interface of the <i>MMS</i>.</p>	<p>generating in accordance with the <i>dispatch schedule</i> communicated and within <b><u>the dispatch conformance</u></b> the <i>standards</i> set forth in this <i>Market Manual</i>.</p> <p><b>c. <u>For ancillary service providers who are scheduled, ensure reserve schedules are available and respond in accordance with the technical requirements expected for each reserve category and within the reserve conformance standards set forth in this Market Manual.</u></b></p> <p><b>ed.</b> Maintaining their respective infrastructure to ensure access to the Market Participant Interface of the <i>MMS</i>.</p>	standards is consistent with Section 10.3 of DC2021-03-0009
Real-time Dispatch Scheduling – Outputs/Results of Real-time Scheduling	9.6.1	<p><b>The MDOM simultaneously determines the following:</b></p> <p>a. <i>Target loading levels</i> in MW for the end of a <i>dispatch interval</i>, identified as the RTD schedule</p> <p>b. <i>Reserve allocations</i> for the <i>dispatch interval</i>;</p> <p>c. Associated <i>energy prices</i> at all <i>market trading nodes</i>, and</p> <p>d. When applicable, <i>reserve prices</i> for all <i>reserve regions</i>.</p>	<p><b>The MDOM simultaneously determines the following:</b></p> <p>a. <i>Target loading levels</i> in MW for the end of a <i>dispatch interval</i>, identified as the RTD schedule</p> <p>b. <i>Reserve <del>allocations</del> <u>schedules</u></i> for the <b><u>entire</u></b> <i>dispatch interval</i>;</p> <p>c. Associated <i>energy prices</i> at all <i>market trading nodes</i>, and</p> <p>d. When applicable, <i>reserve prices</i> for all <i>reserve regions</i>.</p>	Clerical revisions
Dispatch Implementation - Background	(new)	(new)	<b><u>11.1.7 Dispatch of scheduled reserves shall be in accordance with Section 23 of this Manual.</u></b>	For clarity.

E. WESM Manual on Dispatch Protocol, Issue 16.0				
Title	Clause	Provision	Proposed Amendment	Rationale
Scheduling and Dispatch of Reserves - Responsibilities	15.3.1	The <i>System Operator</i> is responsible for monitoring the compliance of each <i>reserve</i> provider in the <i>WESM</i> . This compliance monitoring report shall be submitted to the <i>Market Operator</i> .	The <i>System Operator</i> is responsible for monitoring the compliance of each <i>reserve</i> provider in the <i>WESM</i> . This compliance monitoring report shall be submitted to the <i>Market Operator</i> <b><u>based on the provisions of Section 23 of this Manual.</u></b>	For clarity.
Scheduling and Dispatch of Reserves - Responsibilities	15.3.2	The <i>Market Operator</i> is responsible for ensuring that the required <i>reserve</i> levels per <i>System Operator</i> are used as inputs in pre-dispatch <i>market projections</i> and <i>real-time dispatch</i> scheduling processes in the <i>WESM</i> . It is also responsible for providing and maintaining the facility for timely receipt of submissions from the <i>System Operator</i> .	The <i>Market Operator</i> is responsible for ensuring that the required <i>reserve</i> levels ( <b><u>or reserve requirements</u></b> ) <del>per</del> <b><u>from the</u></b> <i>System Operator</i> are used as inputs in pre-dispatch <i>market projections</i> and <i>real-time dispatch</i> scheduling processes in the <i>WESM</i> . It is also responsible for providing and maintaining the <b><u>data exchange</u></b> facility for timely receipt of submissions from the <i>System Operator</i> .	Clerical revisions for clarity.
Scheduling and Dispatch of Reserves - Responsibilities	(new)	(new)	<b><u>15.3.3 Ancillary Service Providers are responsible for ensuring that their reserve schedules are available to respond to the frequency control requirements of the Grid.</u></b>	To clarify that Ancillary Service providers are required to conform with reserve schedules and frequency control requirements.
Scheduling and Dispatch of Reserves – Determination of Reserve Requirements	15.4	15.4 Determination of <i>Reserve Requirements</i>  15.4.1 Criteria for Determining Reserve Requirements. In determining <i>reserve</i> requirements for each <i>reserve</i> type in accordance with the relevant <i>ERC</i> issuances on the procurement of <i>ancillary services</i> , the <i>System Operator</i> shall ensure compliance with the power quality and reliability	15.4 Determination of <i>Reserve Requirements</i>  15.4.1 Criteria for Determining Reserve Requirements. In determining <i>reserve</i> requirements for each <i>reserve</i> type in accordance with the relevant <b><u>DOE and ERC</u></b> issuances on the procurement of <i>ancillary services</i> , the <i>System Operator</i> shall ensure compliance with the power quality and reliability performance standards set out in	To include DOE issuances as basis for level of reserve requirements

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Title	Clause	Provision	Proposed Amendment	Rationale
		<p>performance standards set out in the Philippine <i>Grid Code</i>.</p> <p>15.4.2 The level of <i>reserve</i> requirement for regulating <i>reserve</i> service shall be based on the latest issuances on the procurement of <i>ancillary services</i> by the <i>ERC</i>, and shall be used as reference by the <i>Market Operator</i> for the <i>market projections</i> and <i>real-time dispatch schedule</i>.</p> <p>15.4.3 For <i>contingency reserve</i> service and <i>dispatchable reserve</i>, the <i>System Operator</i> shall determine the level of <i>reserve</i> requirement in accordance with the latest issuances on the procurement of <i>ancillary services</i> by the <i>ERC</i>.</p> <p>15.4.4 The <i>Market Operator</i>, in coordination with the <i>System Operator</i>, shall formulate and maintain its procedures for determining the MW level of the <i>reserve</i> requirements.</p>	<p><u>those issuances and/or</u> the Philippine <i>Grid Code</i>.</p> <p>15.4.2 The level of <i>reserve</i> requirement for regulating <i>reserve</i> service shall be based on the latest issuances on the procurement of <i>ancillary services</i> by the <b><u>DOE and the ERC</u></b>, and shall be used as reference by the <i>Market Operator</i> for the <i>market projections</i> and <i>real-time dispatch schedule</i>.</p> <p>15.4.3 For <i>contingency reserve</i> service and <i>dispatchable reserve</i>, the <i>System Operator</i> shall determine the level of <i>reserve</i> requirement in accordance with the latest issuances on the procurement of <i>ancillary services</i> by the <b><u>DOE and the ERC</u></b>.</p> <p>15.4.4 The <i>Market Operator</i>, in coordination with the <i>System Operator</i>, shall formulate and maintain its procedures for determining the MW level of the <i>reserve</i> requirements.</p>	
Scheduling and Dispatch of Reserves – Deadband Settings	(new)	(new)	<p><b><u>15.6 Deadband Settings</u></b></p> <p><b><u>15.6.1 Reserve facilities scheduled to provide regulating reserve shall ensure that their deadband is set within +/- 0.15 Hz.</u></b></p> <p><b><u>15.6.2 Reserve facilities scheduled to provide contingency reserve shall ensure that their deadband is set greater than – 0.30 Hz but less than - 0.15 Hz.</u></b></p>	To include deadband settings for reserve facilities based on the setting used by SO during testing

<b>E. WESM Manual on Dispatch Protocol, Issue 16.0</b>				
<b>Title</b>	<b>Clause</b>	<b>Provision</b>	<b>Proposed Amendment</b>	<b>Rationale</b>
Scheduling and Dispatch of Reserves – Dispatching Ancillary Service Providers through Automatic Generation Control	(new)	(new)	<p><b><u>15.7 Dispatching Ancillary Service Providers through Automatic Generation Control</u></b></p> <p><b><u>15.7.1 Reserve facilities operating on automatic generation control (AGC) shall receive commands from the System Operator’s Energy Management System (EMS)</u></b></p>	To clarify mode of receipt of dispatch instructions by reserve facilities operating on AGC
Scheduling and Dispatch of Reserves – Dispatching Ancillary Service Providers through Governor Control Mode	(new)	(new)	<p><b><u>15.8 Dispatching Ancillary Service Providers through Governor Control Mode</u></b></p> <p><b><u>15.8.1 Reserve facilities operating on governor control mode (GCM) shall ensure that their deadband setting is configured based on the requirements of Section 15.6 of this Manual to ensure that they respond to requirements of the Grid for frequency control.</u></b></p>	To clarify mode of receipt of dispatch instructions by reserve facilities operating on GCM
Monitoring the Effective Provision of Ancillary Services	(new)	(new)	<p><b>SECTION 23 MONITORING THE EFFECTIVE PROVISION OF ANCILLARY SERVICES</b></p> <p>(see <i>Attachment A</i> for contents of Section 23)</p>	To provide basis for monitoring of conformance of reserve providers to reserve schedules. Development of reserve conformance standards is consistent with

<b>E. WESM Manual on Dispatch Protocol, Issue 16.0</b>				
<b>Title</b>	<b>Clause</b>	<b>Provision</b>	<b>Proposed Amendment</b>	<b>Rationale</b>
				Section 10.3 of DC2021-03-0009

<b>SECTION 23 MONITORING THE EFFECTIVE PROVISION OF ANCILLARY SERVICES</b>
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### 23.1 Overview

23.1.1 WESM Rules Clause 3.3.7.4 states that the *System Operator* shall continuously update the reserve effectiveness factors for each reserve facility category, and the capacity of reserve for each category according to regions to be scheduled by the market dispatch optimization model, to accurately reflect the power system.

23.1.2 The reserve effectiveness factor (REF) measures the reserve facility's adequacy, accuracy, and timeliness in its actual reserve response with respect to the expected operating parameters set for a specific type of reserve.

23.1.3 The technical and operational data to measure the REF shall be acquired from the System Operator's SCADA-EMS.

### 23.2 Responsibilities

23.2.1 The System Operator shall continuously monitor the reserve facility's REF for each dispatch interval.

### 23.3 Measuring the Reserve Effectiveness Factor of Regulating Reserves on AGC

23.3.1 The REF for a regulating reserve facility on AGC shall be based on the following criteria:

- a. Response Time: At least 75% of the desired generation adjustment is reached at a maximum of 25 seconds
- b. Regulating Capacity: At least 1% of the scheduled regulating reserve capacity

#### 23.3.2 Measuring REF based on Response Time

23.3.2.1 The REF for a regulating reserve facility on AGC with respect to its response time shall be based on the reserve facility's ability to comply with the AGC command sent by the SCADA-EMS within the required time.

23.3.2.2 The following table shows the REFs for each range of time the regulating reserve facility was able to provide at least 75% of the generation output instructed as AGC command.

Range of Response Time, seconds	REF
0 – 15	1.00
16 – 20	0.95
21 – 25	0.90
26 – 32	0.80
Greater Than 32	0.70
No Response	0.00

#### 23.3.3 REF based on Regulating Capacity

23.3.3.1 The REF for a regulating reserve facility on AGC with respect to its regulating capacity shall be based on the reserve facility's maximum actual generation output and highest generation output instructed as AGC command within a dispatch interval. It shall be computed as such:

$$Performance_{REG-AGC,RC,i} = \frac{Maximum\ Actual\ Generation_i}{Highest\ Generation\ from\ AGC\ Command_i}$$

Where:

$Performance_{REG-AGC,RC,i}$	refers to the performance of the regulating reserve facility on AGC with respect to its regulating capacity at dispatch interval i
$Maximum\ Actual\ Generation_i$	refers to the maximum actual generation output within dispatch interval i
$Highest\ Generation\ from\ AGC\ Command_i$	refers to the highest generation output instructed as AGC command within a dispatch interval i

23.3.3.2 The following table shows the REFs for each performance range calculated in the previous clause.

Performance, %	REF
Greater Than 99%	1.00
95% < Performance ≤ 99%	0.97
90% < Performance ≤ 95%	0.95
85% < Performance ≤ 90%	0.90
80% < Performance ≤ 85%	0.85
75% < Performance ≤ 80%	0.80
0% < Performance ≤ 75%	0.70
0%	0.00

23.3.4 The overall REF for a regulating reserve facility on AGC shall be computed as such:

$$REF_{REG-AGC,i} = \frac{REF_{REG-AGC,RT,i} + REF_{REG-AGC,RC,i}}{2}$$

Where:

$REF_{REG-AGC,i}$	refers to the REF for regulating reserve facility on AGC at dispatch interval i
$REF_{REG-AGC,RT,i}$	refers to the REF for regulating reserve facility on AGC with respect to its response time at dispatch interval i
$REF_{REG-AGC,RC,i}$	refers to the REF for regulating reserve facility on AGC with respect to its regulating capacity at dispatch interval i

## 23.4 Measuring the Reserve Effectiveness Factor of Regulating Reserves on Governor Control Mode

23.4.1 The REF for a regulating reserve facility on Governor Control Mode (GCM) shall be based on the following criteria

- a. Accuracy: plant's ability to increase or decrease its generation when the power system frequency goes beyond the generating unit's dead-band setting, with respect to its static gain
- b. Response Time: plant's ability to increase or decrease its generation within the required response time

### 23.4.2 Measuring REF based on Accuracy

23.4.2.1 The REF for a regulating reserve facility on GCM with respect to its accuracy shall be based on its static gain. The static gain shall be computed as such:

$$\text{Static Gain}_{REG-GCM,i} = \frac{\text{Capacity of the Generating Unit}_i}{\text{Droop Setting} \times \text{Nominal Frequency}}$$

Where:

<i>Static Gain</i> <sub>REG-GCM,i</sub>	refers to the static gain of the regulating <i>reserve facility</i> on GCM at dispatch interval i
<i>Capacity of the Generating Unit</i> <sub>i</sub>	refers to the maximum available capacity of the <i>reserve facility</i> at dispatch interval i
<i>Droop Setting</i>	refers to the reference setting to which a <i>reserve facility's</i> generation output changes with respect to the change in <i>frequency</i> .
<i>Nominal Frequency</i>	is defined in the <i>Philippine Grid Code</i> to be at 60 Hz

23.4.2.2 The performance of a regulating reserve facility on GCM with respect to its accuracy shall be based on the reserve facility's actual MW response and its expected response based on its static gain. It shall be computed as such:

$$\begin{aligned} \text{Performance}_{REG-GCM,ACC} &= \text{ABS} \left[ \frac{\text{Actual Response}}{\text{Expected Response based on Static Gain}} \right] \times 100\% \\ \text{Expected Response based on Static Gain} &= \text{Static Gain} \times \text{Change in Frequency} \end{aligned}$$

23.4.2.3 The following table shows the REFs for each range of the performance calculated for its *reserve response accuracy*.

Performance, x	REF
Within 5%	1.00
$5% < x \leq 15%$	0.95
$15% < x \leq 20%$	0.90
$20% < x \leq 30%$	0.85
$x > 30%$	0.00

### 23.4.3 Measuring REF based on Response Time

23.4.3.1 The REF for a regulating reserve facility on GCM with respect to its response time shall be based on the reserve facility's ability to respond within the required time.

23.4.3.2 The following table shows the REFs for each range of time the regulating reserve facility was able to provide at least 75% of the generation output expected based on static gain, as prescribed in clause 23.4.2.2 of this *Manual*.

Range of Response Time, seconds	REF
0 – 15	1.00
16 – 20	0.95
21 – 25	0.90
26 – 32	0.80
Greater Than 32	0.70
No Response	0.00

23.4.4 The overall REF for a regulating reserve facility on GCM shall be computed as such:

$$REF_{REG-GCM,i} = \frac{REF_{REG-GCM,ACC,i} + REF_{REG-GCM,RT,i}}{2}$$

Where:

$REF_{REG-GCM,i}$  refers to the REF for regulating reserve facility on GCM at dispatch interval i

$REF_{REG-GCM,ACC,i}$  refers to the REF for regulating reserve facility on GCM with respect to its accuracy at dispatch interval i

$REF_{REG-GCM,RT,i}$  refers to the REF for regulating reserve facility on GCM with respect to its response time at dispatch interval i

## 23.5 Measuring the Reserve Effectiveness Factor of Contingency Reserves

23.5.1 The REF for a *contingency reserve* facility shall be based on the following criteria

- a. Reserve Capacity: At least 1% of the scheduled *contingency reserve* capacity

### 23.5.2 REF based on Reserve Capacity

23.5.2.1 The REF for a *contingency reserve facility* with respect to its *reserve capacity* shall be based on the *contingency reserve facility's* maximum actual generation

output and the expected reserve response within a dispatch interval. It shall be computed as such:

$$Performance_{CON,RSC,i} = \frac{Maximum\ Actual\ Generation_i}{Expected\ Reserve\ Response_i}$$

Where:

$Performance_{CON,RSC,i}$  refers to the performance of the *contingency reserve facility* with respect to its reserve capacity at dispatch interval i

$Maximum\ Actual\ Generation_i$  refers to the maximum actual generation output within dispatch interval i

$Expected\ Reserve\ Response_i$  refers to the expected response at dispatch interval i

23.5.2.2 The following table shows the REFs for each performance range calculated in the previous clause.

Performance, %	REF
Greater Than 99%	1.00
97% < Performance ≤ 99%	0.95
96% < Performance ≤ 97%	0.90
96% < Performance ≤ 95%	0.80
0%	0.00

23.5.3 The overall REF for a *contingency reserve facility* shall be computed as such:

$$REF_{CON,i} = REF_{CON,RSC,i}$$

Where:

$REF_{CON,i}$  refers to the REF for *contingency reserve facility* at dispatch interval i

$REF_{CON,RSC,i}$  refers to the REF for *contingency reserve facility* with respect to its reserve capacity at dispatch interval i

## 23.6 Measuring the Reserve Effectiveness Factor of Dispatchable Reserves

23.6.1 The REF for a *dispatchable reserve facility* shall be based on the following criteria:

- Synchronization Time: Should be synchronized to the *Grid* within 15 minutes from *dispatch instruction*
- Reserve Capacity: At least 1% of the scheduled *dispatchable reserve capacity*

23.6.2 Measuring REF based on Synchronization Time

- 23.6.2.1 The following table shows the REFs for each range of time the *dispatchable reserve facility* was able to synchronize upon issuance of *dispatch instruction*.

Range of Response Time, x, minutes	REF
$0 < x \leq 15$	1.00
$15 < x \leq 20$	0.90
$20 < x \leq 30$	0.80
$30 < x \leq 45$	0.70
No Response	0.00

### 23.6.3 REF based on Reserve Capacity

- 23.6.3.1 The REF for a *dispatchable reserve facility* with respect to its *reserve capacity* shall be based on the *dispatchable reserve facility's* maximum actual generation output and the expected *reserve response* within a dispatch interval. It shall be computed as such:

$$Performance_{DIS,RSC,i} = \frac{Maximum\ Actual\ Generation_i}{Expected\ Reserve\ Response_i}$$

Where:

$Performance_{DIS,RSC,i}$  refers to the performance of the *dispatchable reserve facility* with respect to its reserve capacity at dispatch interval i

$Maximum\ Actual\ Generation_i$  refers to the maximum actual generation output within dispatch interval i

$Expected\ Reserve\ Response_i$  refers to the *dispatch instruction* issued at dispatch interval i

- 23.6.3.2 The following table shows the REFs for each performance range calculated in the previous clause.

Performance, %	REF
Greater Than 99%	1.00
$97\% < Performance \leq 99\%$	0.95
$96\% < Performance \leq 97\%$	0.90
$96\% < Performance \leq 95\%$	0.80
0%	0.00

- 23.6.4 The overall REF for a *dispatchable reserve facility* shall be computed as such:

$$REF_{DIS,i} = \frac{REF_{DIS,ST,i} + REF_{DIS,RSC,i}}{2}$$

Where:

$REF_{DIS,i}$  refers to the REF for *dispatchable reserve facility* at dispatch interval i

$REF_{DIS,ST,i}$  refers to the REF for *dispatchable reserve facility* with respect to its synchronization time at dispatch interval i

$REF_{DIS,RSC,i}$

refers to the REF for *dispatchable reserve facility* with respect to its reserve capacity at dispatch interval  $i$