MINUTES OF THE RULES CHANGE COMMITTEE 120th MEETING – SPECIAL (No. 2016-13)	
Meeting Date & Time:	26 October 2016, 1:00PM to 5:00PM
Meeting Venue:	18/F PEM Board Room, Robinsons Equitable Tower, Ortigas Center, Pasig City

Attendance List

In-Attendance	Not In-Attendance
Rules Change Committee **Principal Members:** Concepcion I. Tanglao – Independent Allan C. Nerves–Independent Abner B. Tolentino – Generation (PSALM) Theo Cruz Sunico – Generation (1590 EC) Jose Ildebrando B. Ambrosio – Generation (Northwind) Ciprinilo C. Meneses – Distribution (MERALCO) Isidro E. Cacho – Market Operator (PEMC) **Alternate Member:** Henry V. dela Cruz – System Operator (NGCP) Ma. Erliza C. Casas – Generation (PSALM)	Maila Lourdes G. de Castro, Chairperson – Independent Francisco Leodegario R. Castro, Jr. – Independent Juanito O. Tolentino, Jr. – Distribution (MECO) Jose P. Santos –Distribution (INEC) Ludovico D. Lim – Distribution (ANTECO) Lorreto H. Rivera – Supply (TPEC) Ambrocio R. Rosales – System Operator (NGCP)
PEMC – Market Assessment Group (MAG) Elaine D. Gonzales Geraldine A. Rodriguez Divine Gayle C. Cruz Aldjon Kenneth M. Yap	
PEMC – Legal Atty. Sheryll M. Dy	
DOE Observers Ferdinand B. Binondo Lorelie Baguio-Moya	

There being a quorum, Ms. Concepcion Tanglao, acting as RCC chairperson in the absence of Atty. Maila Lourdes G. de Castro, commenced with the meeting at approximately 1:00 PM.

Ms. Tanglao noted the changes to the meeting agenda as relayed by the Secretariat. There being no objection to the changes made on the agenda, the body approved the agenda, as revised.

1. Matters Arising from the Previous Meeting

1.1. Proposed Amendments to the WESM Manual on Management Procedures for Load Shedding – Comments to the RCC-MH-2016-12_119

Ms. Tanglao led the re-deliberation on the proposed amendments to the WESM Manual on Management Procedures for Load Shedding. Said second review was triggered by the comments received from the DOE and Ms. Tanglao on the highlights of the 119th RCC meeting held last 05 October 2016 as emailed by the Secretariat. In her comments, Ms. Tanglao pointed out that the usage of the words "procedure" and "program" in the manual may actually differ in context, and thus the agreement to substitute procedures for program may need to be further reviewed. It was recalled that during the RCC's 119th meeting, Mr. Ambrocio Rosales suggested that the global change of the term "Load Shedding Program" to "Load Shedding Procedures" be reflected in the entire manual to which the RCC concurred during the said meeting. The Secretariat, upon its review of the manual, informed the RCC that it noted that the term "Load Shedding Procedures" was used as a section title in the manual with said section providing the step-by-step procedures in shedding loads. The RCC also discussed that the word "allocation" be added to the term load shedding program to be consistent with what was stated in Annex A of the Manual. The Secretariat thus presented the recommended changes to Section 3.1 of the proposal as follows:

> 3.1 The System Operator shall be responsible for the following:
>
> xxx
>
> 3.1.8 Establish a load shedding **allocation** program based on agreed priorities and equitable load sharing ~~between~~ **among** the ~~distribution utilities, directly connected customers and cooperatives~~ **WESM Members** as shown in Appendix A.

3.1.9 Annually review the load shedding **allocation** program in coordination with the Market Operator**, the Grid Management Committee (GMC)** and the WESM Members. ~~subject to the approval of the PEM Board.~~

Ms. Lorelie Baguio-Moya, on the other hand, suggested to define the term "load shedding allocation program" in the manual. The Secretariat explained that the definition is provided in Appendix A of the said manual. Upon checking, Ms. Moya agreed with the Secretariat's clarification.

The Secretariat also recommended clerical corrections to the manual as follows:

1.1.1 WESM Rules 3.9.1 states xxx c) Other network conditions, as determined by the System Operator~~'s~~ **in** accordance with the procedures established under the Grid Code and Distribution Code;

4.1.1. The nodal prices are reflective of the Nodal Vo**LL**~~l~~t price based on market projections or dispatch optimization performed prior to commencement of each trading interval.

There being no further comments, the RCC approved the revised amendments to the WESM Manual on Management Procedures for Load Shedding as well as the drafted resolution, Resolution 16-13, approving the said proposal. The RCC also agreed to endorse the said above-mentioned amendments to the PEM Board for approval and endorsement to the DOE.

Agreements/Action Plans:
The RCC approved the proposal for endorsement to the PEM Board

1.2. Proposed Amendments to the WESM Manual on Price Determination Methodology

Prior to the deliberation of the remaining provisions of the WESM Manual on Price Determination Methodology, Mr. Edward Olmedo presented the comparison between the current and the proposed Pricing Substitution Methodology mechanism (PSM) as follows:

Current	Proposed
Trigger Factor For zero to positive prices: $TF = \frac{LMP_{HIGH}}{MCP_{HIGH}}$ For negative to positive prices: $TF = \frac{LMP_{HIGH} - LMP_{LOW}}{MCP_{HIGH}}$ Current TF threshold 1.2	$\text{Price Trigger Factor}_i = \frac{\sqrt{\frac{\sum_{j \in J}\left[EDS_{j,i} * \left(EDP_{j,i} - NWAP_i\right)^2\right]}{\sum_{j \in J}\left(EDS_{j,i}\right)}}}{NWAP_i}$ Where: J refers to the set of all resources $EDS_{j,i}$ refers to the *energy dispatch schedule* of resource j at *dispatch interval* i $EDP_{j,i}$ refers to the *nodal energy dispatch price* of resource j at *dispatch interval* i $NWAP_i$ refers to the weighted average price of all resources and computed as: $NWAP_i = \frac{\sum_{j \in J}\left(EDP_{j,i} * EDS_{j,i}\right)}{\sum_{j \in J}\left(EDS_{j,i}\right)}$ The new formula merely tries to account for all scenarios instead of having multiple conditions, such as ▪ Having negative prices uses a different formula in the previous mechanism ▪ Zero MCP High ▪ Impact of Integration of Reserves on LMP and particularly on the determination of the marginal price (introduction of opportunity costs) Proposed TF threshold: **0.2** (only captures 75% of the non-congested intervals)
Other mechanisms in place: ▪ Regional PSM in cases where HVDC flow meets its limits or there is no HVDC flow (0 MW) ▪ Evaluation of Zero High MCP is not based on Trigger Factor but rather on the difference between nodal prices (LMPH – LMPL, or high minus low)	Proposal to eliminate unnecessary mechanisms and to cover the mechanism for reserves: ❑ Regional PSM is only applied when flow between grid interconnections is zero ❑ Reserve Prices are also corrected upon application of PSM where: ▪ Highest Reserve Offer Price Cleared (HROP) is determine ▪ Opportunity costs (OC) are re-calculated based on new LMPs of reserve providers

- The highest value considering the sum of the HROP and OC shall be the new reserve marginal price

- As defined, the reserve price for each reserve region and reserve category shall be determined as the shadow price on the relevant reserve requirement constraint in the dispatch optimization for that dispatch interval

- It can also be interpreted as the maximum of summation of all reserve providers' reserve offer price and opportunity cost from energy, if there is any

$$\text{Zonal Reserve Price} = \text{Max}\left[\text{ROP}_j + \text{OppCost}_j\right]$$

- With that said, the reserve prices shall be corrected as such

$$\text{SRP}_{j,\,r,\,a,\,i} = \text{Max}\left[\text{ROP}_{j,\,r,\,a,\,i} + \text{OppCost}_{\text{UNCD-j},\,r,\,a,\,i}\right]$$

Where:

$SRP_{j,\,r,\,a,\,i}$	refers to the substitute *reserve price* of *reserve category r* in *reserve region a* for *dispatch interval i*
$ROP_{j,\,r,\,a,\,i}$	refers to the *reserve offer* price in *reserve category r* in *reserve region a* for *dispatch interval i* during the *constrained solution*
$OppCost_{UNCD\text{-}j,\,r,\,a,\,i}$	refers to the opportunity cost based on the *unconstrained solution* in *reserve category r* in *reserve region a* for *dispatch interval i*

Mr. Ciprinilo Menses inquired whether the trigger factor threshold will be solved per dispatch interval noting that a new formula in computing the trigger factor is proposed. Mr. Olmedo explained that the intention is to capture all the pricing substitutions. He further stated that previously, the trigger factor threshold was set at 1.2. Moreover, using historical data and the proposed new formula, the new trigger factor threshold was instead set at 0.2 together with the recommendation for an annual review of the said factor. Clarifications in the definition of the opportunity cost were also raised by Mr. Meneses, with Mr. Meneses stating that the definition does not seem to be reflected in the proposal. Mr. Olmedo agreed to provide the details of the opportunity cost in the amendment.

Mr. Meneses stated that MERALCO's concern is with respect to its embedded generators and customers which share the same nodes and still incur line rental charges. Mr. Olmedo explained that this is due to price separation of loads and generators. Mr. Isidro Cacho also explained that there are some cost recovery charges being charged to the customers which are treated as line rental fees. Mr. Abner Tolentino inquired if the same can be addressed through proper modeling. Mr. Olmedo explained that the PSM addresses network congestions only. He further explained that in order to have a PSM, the threshold must be triggered and

network constraints should be present. He also added that the non-occurrence of the PSM may be addressed through improvements of the transmission systems.

Ms. Tanglao noted the concerns of the body and moved to the finalization of the proposed amendments to the PDM manual facilitated by Ms. Karen Varquez. The body agreed to adopt the clerical amendments and discussed clarifications giving due considerations to the comments submitted by Ms. Tanglao and the comments of the RCC as noted by the Secretariat during the RCC's previous deliberation on the same, for clarity and consistency.

The RCC agreed to finalize the provisions in the PDM as attached in this minutes as Annex A.

On the computation for reserve trading amount, Ms. Varquez explained that for consistency, PEMC proposes to add a factor which would result to the use of the proper unit of the computed values in the formula. The amended formula is as follows:

$$RTA_{j,\,r,\,a,\,h} = \frac{1}{n}\sum_{i \in h}\left(RDP_{j,\,r,\,a,\,i} * RQ_{j,\,r,\,a,\,i}\right)$$

(where the n refers to the number of dispatch intervals within a settlement interval)

With the RCC in agreement, the RCC moved to approve the proposed amendments to the WESM Manual on Price Determination Methodology for endorsement to the PEM Board.

Agreements/Action Plans:
The Secretariat shall draft a resolution approving the proposed amendments to the WESM Market Manual on Price Determination Methodology, subject for the approval of the RCC.

1.3. Proposed Amendments to the WESM Manual on Constraint Violation Coefficient and Pricing Re-runs

The RCC deliberated on the proposed amendments to the Constraint Violation Coefficient manual with due consideration to the comments from the DOE and responses received on the same. Ms. Tanglao also submitted her comments which were duly considered by the body.

Ms. Varquez facilitated the discussion with the agreements of the RCC, as follows:

- ✓ Minor and clerical corrections on the provisions were made for clarity
- ✓ On Section 4.2, the definitions for the enumerated constraints were modified to provide brief descriptions for each item
- ✓ Some of the deleted phrases on Section 4.2 were recommended to be transferred to the table of CVCs, as applicable
- ✓ On the hierarchy of CVCs, the RCC agreed to clearly provide the order by which constraints may be violated (from the least to greatest – in terms of importance)

The final agreements of the RCC are attached in this minutes as Annex B.

Following the agreements above, the RCC approved the proposed amendments to the WESM manual on Constraint Violation Coefficient for endorsement to the PEM Board.

Agreements/Action Plans:
The Secretariat shall draft a resolution approving the proposed amendments to the WESM Market Manual on Constraint Violation Coefficient and Pricing Re-runs, subject for the approval of the RCC.

1.4. Proposed Amendments to the WESM Rules and Market Manual on Metering Standards and Procedures

Ms. Geraldine Rodriguez requested for the deferment of the deliberation on the proposed amendments to the WESM Rules and Market Manual on Metering Standards and Procedures, as there are substantial corrections and revisions that still need to be carefully looked reviewed before the said manual is finalized.

Agreements/Action Plans:
The RCC moved to defer the deliberation of the proposal to the next scheduled meeting.

2. Next Meeting

The next RCC meeting was set as follows:

- 122nd RCC Meeting – 09 November 2016

3. Adjournment

There being no other matter to be discussed, the meeting was adjourned at around 5:00 PM.

Prepared By:	Reviewed By:	Noted By:
Aldjon Kenneth M. Yap	**Geraldine A. Rodriguez**	**Elaine D. Gonzales**
Analyst *– Market Governance Administration Unit*	***Assistant Manager –*** *Market Governance Administration Unit*	***Manager*** *– Market Data and Analysis Division*
Market Assessment Group	***Market Assessment Group***	***Market Assessment Group***

Approved by: RULES CHANGE COMMITTEE **Maila Lourdes G. de Castro** Chairperson Independent	
Members:	
Concepcion I. Tanglao Independent	**Francisco L.R. Castro, Jr.** Independent
Allan C. Nerves Independent	**Isidro E. Cacho, Jr.** Market Operator Philippine Electricity Market Corporation (PEMC)
Ambrocio R. Rosales Transmission Sector National Grid Corporation of the Philippines (NGCP)	**Abner B. Tolentino** Generation Sector Power Sector Assets and Liabilities Management Corporation (PSALM)
Atty. Jose Ildebrando B. Ambrosio Generator Sector NorthWind Power Development Corp. (NorthWind)	**Theo C. Sunico** Generation Sector Vivant Corporation
Ciprinilo C. Meneses Distribution Sector (PDU) Manila Electric Company (MERALCO)	**Jose P. Santos** Distribution Sector (EC) Ilocos Norte Electric Cooperative, Inc. (INEC)
Juanito O. Tolentino, Jr. Distribution Sector (PDU) Mactan Electric Company (MECO)	**Ludovico D. Lim** Distribution Sector (EC) Antique Electric Cooperative, Inc. (ANTECO)
Lorreto H. Rivera Supply Sector TeaM (Philippines) Energy Corporation (TPEC)	

Philippine Electricity Market Corporation

RCC-MIN-16-13_120
26 October 2016
Annex A

Proposed Amendments to the WESM Manual on Price Determination Methodology

Title	Section	Provision	Proposed Amendment	Rationale	Comments	Proposed Revised Wording in relation to Comment	Rationale for the Proposed Revised Wording	RCC Adopted Amendments
		Global changes						• The terms "snapshot quantity" and "dispatch interval" were adopted to relevant provisions in the market manual • Numerous re-numbering due to insertions as adopted by the RCC
Foreword		FOREWORD The establishment of the Philippine Wholesale Electricity Spot Market (the "WESM") is mandated by Republic Act No. 9136, otherwise known as the "Electric Power Industry Reform Act of 2001" (the "EPIRA"). The WESM is to provide the mechanism for determining the price of electricity not covered by bilateral contracts between sellers and purchasers of electricity. Pursuant to the mandate of the EPIRA, the Department of Energy (the "DOE") jointly with the electric power industry participants formulated the detailed rules for the WESM, i.e., the WESM Rules. The WESM Rules were promulgated by the DOE on 28 June 2002. Among other things, the WESM Rules provided for the mechanism for determining the prices of electricity in the market not covered by bilateral contracts.	~~FOREWORD~~ **Section 1 INTRODUCTION** **1.1 Background** **1.1.1** The establishment of the Philippine Wholesale Electricity Spot Market (the "WESM") is mandated by Republic Act No. 9136, otherwise known as the "Electric Power Industry Reform Act of 2001" (the "EPIRA"). ~~The WESM is to provide the mechanism for determining the price of electricity not covered by bilateral contracts between sellers and purchasers of electricity.~~ **1.1.2** Pursuant to the mandate of the EPIRA, the Department of Energy (the "DOE") jointly with the electric power industry participants formulated the ~~detailed rules for the WESM, i.e., the~~ WESM Rules. ~~The WESM Rules were promulgated by the DOE on 28 June 2002. Among~~, **which, among** other things, ~~the WESM Rules provided~~	• Rewording, for clarity • Renumbering to conform with the formatting for Market Manuals		• DOE: Section 1 INTRODUCTION 1.1 Background 1.1.1 The establishment of the Philippine Wholesale Electricity Spot Market (**WESM**) is mandated by Republic Act No. 9136, otherwise known as the Electric Power Industry Reform Act of 2001 (**EPIRA**). 1.1.2 Pursuant to the mandate of the EPIRA, the Department of Energy (**DOE**) ~~jointly with the electric power industry participants~~ **jointly formulated with the electric power industry participants** the WESM Rules, which among other~~s~~things, provide~~s~~ the mechanism for determining the prices of electricity in the market not covered by bilateral contracts. **The price determination methodology contained in the WESM Rules shall be subject to the**	Quotation marks on acronyms not necessary For clarity and to give emphasis that the PDM in the WESM Rules is subject to ERC's approval	Adopted, with revisions. ~~FOREWORD~~ **Section 1 INTRODUCTION** **1.1 Background** **1.1.1** The establishment of the Philippine Wholesale Electricity Spot Market (~~the~~ "WESM") is mandated by Republic Act No. 9136, otherwise known as the "Electric Power Industry Reform Act of 2001" (~~the~~ "EPIRA"). ~~The WESM is to provide the mechanism for determining the price of electricity not covered by bilateral contracts between sellers and purchasers of electricity.~~ **1.1.2** Pursuant to the mandate of the EPIRA, the Department of Energy (~~the~~ "DOE"), jointly with the electric power industry participants, formulated the ~~detailed rules for the WESM, i.e., the~~ WESM Rules. ~~The WESM Rules were promulgated by the DOE on 28 June 2002. Among~~,

Title	Section	Provision	Proposed Amendment	Rationale	Comments	Proposed Revised Wording in relation to Comment	Rationale for the Proposed Revised Wording	RCC Adopted Amendments
		This price determination methodology (the "PDM") contained in the WESM Rules is required by the EPIRA to be approved by the Energy Regulatory Commission (the "Commission"). The Price Determination Methodology for the WESM contained in this document was formulated compliant with the WESM Rules and in consultation with the industry participants. Such consultations were conducted through, initially, the WESM Technical Working Group (the "WESM-TWG"), later the Interim Rules Change Committee, and the Philippine Electricity Market Board (the "PEM Board"). This Price Determination Methodology gives the specific details as to how dispatch schedules and locational marginal prices (i.e., nodal prices) are calculated in the Market Dispatch Optimization Model (the "MDOM") as provided for in WESM Rules clause 3.6.	~~for~~**provides** the mechanism for determining the prices of electricity in the market not covered by bilateral contracts. ~~This price determination methodology (the "PDM") contained in the WESM Rules is required by the EPIRA to be approved by the Energy Regulatory Commission (the "Commission").~~ **1.1.3** ~~The Price Determination Methodology for the WESM contained in this document was formulated compliant with the WESM Rules and in consultation with the industry participants. Such consultations were conducted through, initially, the WESM Technical Working Group (the "WESM-TWG"), later the Interim Rules Change Committee, and the Philippine Electricity Market Board (the "PEM Board").~~ This Price Determination Methodology**Manual**~~gives~~**provides** the specific details ~~as to how dispatch schedules and locational marginal prices (i.e., nodal prices) are calculated in the Market Dispatch Optimization Model (the "MDOM"), as provided for in WESM Rules clause 3.6.~~**of such mechanism. It is formulated compliant with the WESM Rules, in consultation**			**approval of the Energy Regulatory Commission (ERC).** 1.1.3 This Price Determination Methodology Manual provides the specific details of such mechanism. It is formulated compliant with the WESM Rules, in consultation with the industry participants, and approved by the ~~Energy Regulatory Commission~~**(ERC)**[1]		**which, among** other~~s things, the WESM Rules provided for~~**provide** the mechanism for determining the prices of electricity in the market not covered by bilateral contracts. **1.1.3** ~~The Price Determination Methodology for the WESM contained in this document was formulated compliant with the WESM Rules and in consultation with the industry participants. Such consultations were conducted through, initially, the WESM Technical Working Group (the "WESM-TWG"), later the Interim Rules Change Committee, and the Philippine Electricity Market Board (the "PEM Board").~~ This Price Determination Methodology **Manual**~~gives~~**provides** the specific details ~~as to how dispatch schedules and locational marginal prices (i.e., nodal prices) are calculated in the Market Dispatch Optimization Model (the "MDOM"), as provided for in WESM Rules clause 3.6.~~**of such mechanism. It is formulated compliant with the WESM Rules, in consultation with the industry participants, and approved by the Energy Regulatory Commission (ERC).** The price determination methodology ~~(the "PDM")~~

[1] WESM Rules Clause 3.2

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			with the industry participants, and approved by the Energy Regulatory Commission (the "ERC").[1] *(Footnote **1**: WESM Rules clause 3.2)*					contained in the WESM Rules is required by the EPIRA to be approved by the Energy Regulatory Commission (the "Commission").[1] *(Footnote **1**: WESM Rules clause 3.2)*
Glossary of Terms		NEW	**~~f. Energy Dispatch Quantity. The actual instantaneous injection, for generator resources, withdrawal, for customer resources, or flow, for transmission lines and HVDC interconnection, in MW for a dispatch interval.~~**	Provide a reference quantity for the computation of energy administered prices.				Additional revision, due to clerical correction in Section 7. Rewording of Energy Dispatch Quantity to Snapshot Quantity, for clarity. **~~f. Energy Dispatch Quantity. The actual instantaneous injection, for generator resources, withdrawal, for customer resources, or flow, for transmission lines and HVDC interconnection, in MW for a dispatch interval.~~**
Glossary of Terms		NEW	**f. Final Nodal Energy Dispatch Price. The final nodal price for energy after the application of price substitution due to network congestion or when conditions for price mitigation exists, or administered prices, as applicable.**	Provide a common terminology for the price used in the computation of energy settlement prices.				Additional revision, due to further amendments in Section 4.12.1 and Section 8.
Glossary of Terms		Network Data. These are electrical parameters used to represent the transmission system or network.	**i.**Network Data. ~~These are~~**The**electrical parameters used to represent the transmission system or network **in the market network model.**	Renumbering and clerical edits.				Renumbering due to the insertion of ~~(f) Energy Dispatch Quantity and~~(g) Final Nodal Energy Dispatch Price. **i.**Network Data. ~~These are~~**The**electrical parameters used to represent the transmission ~~system~~**and sub-**

Title	Section	Provision	Proposed Amendment	Rationale	Comments	Proposed Revised Wording in relation to Comment	Rationale for the Proposed Revised Wording	RCC Adopted Amendments
								transmission systems~~or network~~ **in the market network model.**
Glossary of Terms		Security-constrained economic dispatch. Process of apportioning the total load on a system between the various generating plants to achieve the greatest economy of operation and taking account of the limitations of the power system.	**l.**Security-constrained ~~economic~~**dynamic**dispatch. Process of apportioning the total load on a system between the various generating ~~plants~~ **units over a certain time period**to achieve the greatest economy of operation and taking account of the limitations of the power system.	• Renumbering • Minor correction	• TC: The use of the word dynamic to replace economic is not a good choice. (a) Do we not want to highlight that economics is indeed the objective in this optimization? (b) There is no dynamic dispatch here. Solving the optimization problem in different time frames does not produce a dynamic dispatch. Propose to differentiate SCED from SCDD.	• DOE: k. Security-constrained dynamic dispatch. Process of apportioning the total load on a system between the various generating units over a certain time period to achieve the greatest economy of operation and taking **into** account ~~of~~ the limitations of the power system.	• DOE: For clarity	• Adopt DOE's proposed rewording. **k.**Security-constrained ~~economic~~**dynamic**dispatch. The process of apportioning the total load on a system between the various generating ~~plants~~ **units over a certain time period**to achieve the greatest economy of operation and taking **into**account ~~of~~ the limitations of the power system. • SCDD determines scheduling of energy and reserves and market clearing pricing based on the least-cost dispatch of physical resources, for RTD, HAP, DAP, and WAP. Computation of real-time dispatch (RTD) schedules uses the SCED mode of SCDD. • Renumbering due to the insertion of (f) Energy Dispatch Quantity and (g) Final Nodal Energy Dispatch Price. Retained SCED per RCC discussion on 07 September. **l.**Security-constrained economic dispatch. The process of apportioning the total load on a

Title	Section	Provision	Proposed Amendment	Rationale	Comments	Proposed Revised Wording in relation to Comment	Rationale for the Proposed Revised Wording	RCC Adopted Amendments
								system between the various generating plants to achieve the greatest economy of operation and taking into account of the limitations of the power system.
Glossary of Terms		NEW		•				**o. SnapshotQuantity. The actual instantaneous injection, ~~for generator resources, withdrawal, for customer resources, or line flow of power, for transmission lines and HVDC interconnection, in MW at the end of the dispatch intervalfor a dispatch interval.~~**
Glossary of Terms		System marginal price. The price set by the marginal plant scheduled in any trading period or interval.	**p.**System marginal price. The **shadow** price ~~set by the marginal plant scheduled in any trading period or interval.~~ **for which energy is priced.**	• Renumbering • For clarity				Renumbering due to the insertion of ~~(f) Energy Dispatch Quantity and~~(g) Final Nodal Energy Dispatch Price and (o) Snapshot Quantity.
		NEW	**SECTION 3 RESPONSIBILITIES** **3.1 Market Operator** **3.1.1 The Market Operator shall be responsible for the development, validation, maintenance, publication, and revision of this Market Manual in coordination with Trading Participants and the System Operator.** **3.1.2 The Market Operator shall implement the principles and processes provided in this Market Manual.** **3.2 System Operator**	• To conform with the formatting for Market Manuals • To provide the responsibilities of the MO, SO and WESM Members in the development, implementation , and review of the PDM.		• DOE: SECTION 3 RESPONSIBILITIES 3.1 Market Operator ~~3.1.1~~ The Market Operator shall be responsible for the development, validation, maintenance, publication **in the WESM website**, and revision of this Market Manual in coordination with **the**~~Trading~~ **WESM** Participants. ~~and the System Operator.~~ ~~3.1.2 The Market Operator shall implement the principles and processes provided in this Market Manual.~~	• DOE: To give emphasis where the publication will be made by the MO WESM Participants more appropriate that Trading Participants Deleted 3.1.2 because it is already a given fact. There is no 3.1.2 so disregard 3.1.1 and just put the provision under 3.1	Adopt DOE's revised wording, with revision. **SECTION 3 RESPONSIBILITIES** **3.1 Market Operator** **The Market Operator shall be responsible for the development, validation, maintenance, publicationin the MarketInformation Website, and revision of this Market Manual in coordination with WESM Participants.** **3.2 System Operator**

Title	Section	Provision	Proposed Amendment	Rationale	Comments	Proposed Revised Wording in relation to Comment	Rationale for the Proposed Revised Wording	RCC Adopted Amendments
			3.2.1 The System Operator shall provide the necessary information and references for the implementation and subsequent revisions and validation of this Market Manual. **3.3 Trading Participants** **3.3.1 The Trading Participants shall provide the necessary information and references for the implementation and subsequent revisions and validation of this Market Manual.**			3.2 System Operator ~~3.2.1~~ The System Operator shall xxx. 3.3 Trading Participants ~~3.3.1~~ The Trading Participants shall xxx.	There is no 3.2.2 so disregard 3.2.1 and just put the provision under 3.2 There is no 3.3.2 so disregard 3.3.1 and just put the provision under 3.3	**The System Operator shall provide the necessary information and references for the implementation and subsequent revisions and validation of this Market Manual.** **3.3 Trading Participants** **The Trading Participants shall provide the necessary information and references for the implementation and subsequent revisions and validation of this Market Manual.** **3.4 Network Service Providers** **The Network Service Providers shall provide the necessary information for the implementation of this Market Manual.** **Added responsibility of NSPs per RCC discussion on 07 September 2016**
Required Inputs to the MDOM	4.3	4.3. Required Inputs to the MDOM The MDOM receives input data from three sources, namely, the System Operator, the trading participants and the Market Operator. The information	4.3. Required Inputs to the MDOM **4.3.1** The ~~MDOM~~**market dispatch optimization model shall receive** ~~receives~~ input data from three sources, namely, the System Operator, the ~~trading participants~~**Trading Participants**	For clarity.		• DOE: 4.3. Required Inputs to the MDOM 4.3.1 The market dispatch optimization model shall receive input data from three sources, namely, the System Operator,	• DOE: For clarity	Adopt DOE's rewording for 4.3.1. 4.3. Required Inputs to the MDOM **4.3.1** The ~~MDOM~~**market dispatch optimization model shall receive** ~~receives~~ input data from three (3)sources, namely,

Title	Section	Provision	Proposed Amendment	Rationale	Comments	Proposed Revised Wording in relation to Comment	Rationale for the Proposed Revised Wording	RCC Adopted Amendments
		provided is as required in the WESM Rules. System Operator Network data; System snapshot; Reserve requirements for each type of reserve in a reserve region; Outage schedules; Contingency List; Transmission limits; Security limits; and Load pattern.	and the Market Operator. The information provided is as required in the WESM Rules.[15] *(Footnote* **15**: ***WESM Rules clause3.5***) **4.3.2** System Operator **Inputs:** **a.** Network data; **b.** System snapshot; ~~Reserve requirements for each type of reserve in a reserve region;~~ **c.** Outage schedules; **d.** Contingency List; **and** ~~Transmission limits;~~ **e. Over-riding constraints** • Security limits~~; and~~ ➢ **Generation Limits** ➢ **Branch Group Limits** • **Must-Run Generation** ~~Load pattern.~~		• TC:Propose to include non-security limits in the over-riding constraints.	the Trading Participants and the Market Operator. The information provided ~~is~~**are**as required in the WESM Rules.[2] 4.3.2 **The input data from the** System Operator ~~Inputs~~**are as follows:** a. Network data; b. System snapshot; c. Outage schedules; d. Contingency List; and e. Over-riding constraints • Security limits ➢ Generation Limits ➢ Branch Group Limits • Must-Run Generation • TC: *4.3.2 System Operator* Inputs: *a. Network data;* *b. System snapshot;* *c. Outage schedules;* *d. Contingency List;* and e. *Over-riding constraints* • *Security limits* ➢ *Generation* Limits ➢ Branch Group Limits • ***Non-security limits*** • *Must-rungeneration*	• TC: Minor edits. Consistent with the MRU Manual.	the System Operator, the ~~trading participants~~**Trading Participants** and the Market Operator. The information provided ~~is~~**are** as required in the WESM Rules.[15] *(Footnote* **15**: ***WESM Rules clause 3.5***) Adopt TC's rewording for 4.3.2. Suggest for NGCP-SO to further itemize the non-security limits. **4.3.2** System Operator**and Network Service Provider****Inputs:** **a.** Network data; **b.** System snapshot; ~~Reserve requirements for each type of reserve in a reserve region;~~ **c.** Outage schedules; **d.** Contingency List; **and** ~~Transmission limits;~~ **e. Over-riding constraints** • Security limits~~; and~~ ➢ **Generation Limits** ➢ **Branch Group Limits** ➢ **Must-Run Generation** • **Non-security limits** ➢ **Testing and commissioning** ~~Load pattern.~~

Title	Section	Provision	Proposed Amendment	Rationale	Comments	Proposed Revised Wording in relation to Comment	Rationale for the Proposed Revised Wording	RCC Adopted Amendments
		NEW	**4.4.2 The objective function may be comprised of a solution for only one dispatch interval, or a set of dispatch intervals.** **4.4.3 Market projections shall employ a security-constrained dynamic dispatch, wherein the economic gain from trade for each execution of a market projection is maximized for the entire set of dispatch intervals in the covered study period of that market projection.** **4.4.4 The real time dispatch shall employ a security-constrained dynamic dispatch and is solved per dispatch interval.** **4.4.5 If there are no prices and schedules determined during the real time dispatch, then the results of the corresponding hour ahead projection shall be used for that dispatch interval.[17]** *(Footnote **17**: **WESM Rules Clause 3.4.1.2**)*	For clarity.	• TC: It was clarified to the TC that the objective function is applied to both projection and dispatch runs (i.e. set of dispatch intervals refer to projections – DAP, WAP, HAP with more than one set of dispatch intervals). The TC agrees that DAP, WAP and HAP are calculated. However, in each of those cases, calculation is still done for every interval. Suppose I wish to perform a DAP, don't I perform the calculation one day ahead but is still trying to get the optimum dispatch for just one interval one day later? Would appreciate clarification on the matter.	• DOE: 4.4.2 The objective function ~~maybe~~**is** comprised of a solution for **either** only one dispatch interval, or a set of dispatch intervals. xxx 4.4.4 The **real-time** dispatch shall employ a security-constrained dynamic dispatch and **shall be**~~s~~ solved per dispatch interval. 4.4.5 If there are no prices and schedules determined during the **real-time** dispatch, then the results of the corresponding **hour-ahead** projection shall be used for that dispatch interval.	• DOE: For clarity To make it mandatory To observe the correct use of hyphen	On the TC's comment, we wish to clarify that DAP is solved as a single optimization problem for the entire study period (e.g. 1200H DAP run covers 36 hours). Please refer to PEMC's slide on Workflow Runs. On DOE's comment on section 4.4.2, retain original proposal. The objective function is applicable for the RTD, DAP, WAP, HAP, thus the use of "may". Adopt DOE's rewording on section 4.4.4. On the correct use of hyphen, for RCC confirmation on global change for the WESM Rules and all Manuals. **4.4.3 Market projections shall employ a security-constrained economic dispatch, wherein the economic gain from trade for each execution of a market projection is maximized for the entire set of dispatch intervals in the covered study period of that market projection.** **4.4.4 The real time dispatch shall employ a security-constrained economicdispatch and shall be solved per dispatch interval.** Reverted to SCED per RCC discussion on 07 September to retain SCED.

Philippine Electricity Market Corporation

RCC-MIN-16-13_120
26 October 2016
Annex B

Proposed Amendments to the WESM Manual on Constraint Violation Coefficient

Title	Section	Original Provision	Proposed Amendments	RCC Adopted Amendments	Rationale
Title Page		Constraint Violation Coefficients	Constraint Violation Coefficients **and Pricing Re-Runs**	Constraint Violation Coefficients **and Pricing Re-Runs**	• Conduct of pricing re-runs is one of the main contents of the Manual.
Introduction	1	1.1 About this Document xxx	~~1.1 About this Document~~ ~~xxx~~	~~1.1 About this Document~~ ~~xxx~~	Deleted section is moved to Section 1.2, in accordance with the format of WESM Manuals.
Introduction	1	1.2 Purpose xxx	~~1.2 Purpose~~ ~~xxx~~	~~1.2 Purpose~~ ~~xxx~~	Deleted section is moved to Section 1.2, in accordance with the format of WESM Manuals.
Introduction	1	1.3 Scope xxx	~~1.3 Scope~~ ~~xxx~~	~~1.3 Scope~~ ~~xxx~~	Deleted section is moved to Section 1.3, in accordance with the format of WESM Manuals.
Introduction	1	1.4 Intended Audience xxx	~~1.4 Intended Audience~~ ~~xxx~~	~~1.4 Intended Audience~~ ~~xxx~~	Unnecessary section
Introduction	1	1.5 Conventions xxx	~~1.5 Conventions~~ ~~xxx~~	~~1.5 Conventions~~ ~~xxx~~	Deleted section is covered in Section 2, as revised.
Introduction	1	1.6 Background The MDOM determines the optimal dispatch schedule and nodal prices considering the different inputs from the MO (load forecast, network model, etc.), SO (snapshot, reserve requirement, etc.) and Trading Participants (offers, bids, etc.). In some instances, combination of these inputs does not allow the MDOM to produce a feasible solution. Under WESM Rules 3.6.2.1, to allow the MDOM to find a solution which satisfies all constraints, if such a solution exists, constraint violation coefficients (CVCs) will be incorporated in the MDOM. As provided for in the objective of the MDOM (WESM Rules 3.6.1.3), CVCs	~~1.6~~**1.1** Background **1.1.1** The ~~MDOM~~**market dispatch optimization model** determines the optimal dispatch schedule and nodal prices considering the different inputs from the ~~MO~~**Market Operator**~~(load forecast, network model, etc.)~~, ~~SO (snapshot, reserve requirement, etc.)~~**System Operator,** and Trading Participants ~~(offers, bids, etc.)~~**using linear programming**~~. In some instances,~~**The** combination of these inputs ~~does~~**may** not always allow the ~~MDOM~~**market dispatch optimization model** to produce a feasible solution **thus constraint violation variables and associated constraint violation coefficients are necessary to ensure that the market dispatches and market pricing re-runs always**	~~1.6~~**1.1** Background The ~~MDOM~~**market dispatch optimization model** determines the optimal dispatch schedule and nodal prices considering the different inputs from the ~~MO~~**Market Operator**~~(load forecast, network model, etc.)~~, ~~SO (snapshot, reserve requirement, etc.)~~**System Operator,** and Trading Participants ~~(offers, bids, etc.)~~**using linear programming**~~. In some instances,~~**The** combination of these inputs ~~does~~**may** not **always** allow the ~~MDOM~~**market dispatch optimization model** to produce a feasible solution **thus constraint violation variables and associated constraint violation coefficients are necessary to ensure that the market dispatches and market pricing re-runs always** ~~Under WESM Rules 3.6.2.1, to allow the MDOM to~~ find a solution ~~which satisfies all~~	• Consistent with the proposed amendments to the WESM Rules on WESM enhancements to design and operations • Clerical corrections • Renumbering • Deletion of explanatory provisions

Title	Section	Original Provision	Proposed Amendments	RCC Adopted Amendments	Rationale
		are the basis for the cost of constraint violation. xxx	~~Under WESM Rules 3.6.2.1, to allow the MDOM to~~ find a solution ~~which satisfies all constraints,~~ if such a solution exists, ~~constraint violation coefficients (CVCs) will be incorporated in the MDOM. As provided for in the objective of the MDOM (WESM Rules 3.6.1.3), CVCs are the basis for the cost of constraint violation.~~ ~~Xxx~~	~~constraints,~~ if such a solution exists, ~~constraint violation coefficients (CVCs) will be incorporated in the MDOM. As provided for in the objective of the MDOM (WESM Rules 3.6.1.3), CVCs are the basis for the cost of constraint violation.~~ ~~Xxx~~	
Purpose	1.2	This document aim to: 1.2.1 Provide the criteria in determining CVC. 1.2.2 Provide the mechanism in the revision, publication and approval of the CVC penalty price values. 1.2.3 Define the responsibilities of the Market Operator (MO), System Operator (SO) and Trading Participants in relation to the CVC to be used in the MDOM.	~~This document aim to:~~ 1.2.1 ~~Provide the criteria in determining CVC.~~**The systems, processes and procedures set out in this Market Manual on the determination of constraint violation coefficients and market pricing re-runs shall ensure that results of market projections and real-time dispatch in the WESM:** **a. provide economic signals that properly account for the economic impact of losses and constraints that resulted from the operation of the electricity market;[1] and** (*Footnote***1: WESM Rules Clauses 3.2.2 and 3.6.1**) **b. are updated and made available to WESM Participants to ensure they can make timely and informed commercial and technical decisions.[2]** (*Footnote***2: WESM Rules Clause 1.2.5**) ~~1.2.2 Provide the mechanism in the revision, publication and approval of the CVC penalty price values.~~ ~~1.2.3 Define the responsibilities of the Market Operator (MO), System Operator~~	~~This document aim to:~~ 1.2.1 ~~Provide the criteria in determining CVC.~~**The systems, processes and procedures set out in this Market Manual on the determination of constraint violation coefficients and market pricing re-runs shall ensure that results of market projections and real-time dispatch in the WESM:** **a. Provide economic signals that properly account the economic impact of losses and constraints that resulted from the operation of the electricity market;[1] and** (Footnote**1: WESM Rules Clauses 3.2.2 and 3.6.1**) **b. Are updated and made available to WESM Participants to ensure they can make timely and informed commercial and technical decisions.[2]** (Footnote**2: WESM Rules Clause 1.2.5**) ~~1.2.2 Provide the mechanism in the revision, publication and approval of the CVC penalty price values.~~ ~~1.2.3 Define the responsibilities of the Market Operator (MO), System Operator (SO) and~~	• For clarity

Title	Section	Original Provision	Proposed Amendments	RCC Adopted Amendments	Rationale
			~~(SO) and Trading Participants in relation to the CVC to be used in the MDOM.~~	~~Trading Participants in relation to the CVC to be used in the MDOM.~~	
Scope	1.3	This document covers the determination of the CVC and the basic procedures and policies to be applied regarding the CVC's.	~~This document covers the determination of the CVC and the basic procedures and policies to be applied regarding the CVC's.~~ **1.3.1 This Market Manual provides the values of the constraint violation coefficients in order to establish an appropriate priority order for soft constraints.** [3] (*Footnote*3: **WESM Rules Clauses 10.4.11.1 and 3.6.2.4**) **1.3.2 This Market Manual provides the procedures, criteria and conditions necessary for the execution of automatic pricing re-runs.** [4] (*Footnote*4: **WESM Rules Clause 3.6.7.8**) **1.3.3 This Market Manual provides the guidelines and procedures for the execution of a market pricing re-run upon the issuance of pricing error notice.** [5] (*Footnote*5: **WESM Rules Clause 3.10.5.4**) **1.3.4 This Market Manual shall apply to the Market Operator, the System Operator, and the Trading Participants in the WESM.**	~~This document covers the determination of the CVC and the basic procedures and policies to be applied regarding the CVC's.~~ **This Market Manual provides the following:** **a) Values of the constraint violation coefficients in order to establish an appropriate priority order for soft constraints;** [3] (Footnote3: **WESM Rules Clauses 10.4.11.1 and 3.6.2.4**) **b) Procedures, criteria and conditions necessary for the execution of automatic pricing re-runs;** [4] **and** (Footnote4: **WESM Rules Clause 3.6.7.8**) **c) Guidelines and procedures for the execution of a market pricing re-run upon the issuance of pricing error notice.** [5] (Footnote **5: WESM Rules Clause 3.10.5.4**)	• For clarity.
Definition of Terms	2	2 Definition of Terms xxx	2 Definition~~sof Terms~~ **2.1.1 Unless otherwise defined or the context implies otherwise, the italicized terms used in this Market**	2 Definition**s** ~~of Terms~~ **2.1.1 Unless defined or the context implies otherwise, the italicized terms used in this Market Manual shall bear the**	• Deletion of defined terms that are already defined in the body of the Market Manual. • For clarity

Title	Section	Original Provision	Proposed Amendments	RCC Adopted Amendments	Rationale
		2.13 Soft Constraints – constraints pertaining to system and nodal energy balance requirement, regional energy import/export, regional reserve and transmission line limit which are allowed to be violated in the market dispatch optimization model such that the optimization process will produce a solution. xxx	**Manual shall bear the same meaning as defined in the WESM Rules and other Market Manuals.** **2.1.2 The following as used in this Market Manual shall have the following meaning –** ~~xxx~~ ~~2.13~~**a.** Soft Constraints – constraints ~~pertaining to system and nodal energy balance requirement, regional energy import/export, regional reserve and transmission line limit which are allowed to be violated in the market dispatch optimization model such that the optimization process will produce a solution~~**which are allowed to be violated in the market dispatch optimization model such that the optimization process will produce a solution**. ~~xxx~~	**same meaning as defined in the WESM Rules and other Market Manuals.** **2.1.2 The following term as used in this Market Manual shall have the following meaning –** ~~xxx~~ ~~2.13~~**a.** Soft Constraints – constraints ~~pertaining to system and nodal energy balance requirement, regional energy import/export, regional reserve and transmission line limit which are allowed to be violated in the market dispatch optimization model such that the optimization process will produce a solution~~**which are allowed to be violated in the market dispatch optimization model such that the optimization process will produce a solution**. ~~xxx~~	• Other terms were deleted since these are also provided in Section 4.
		NEW	**2.2. References** **This Manual shall be read in association with the following –** **a. WESM Rules** **b. WESM Price Determination Methodology** **c. WESM Dispatch Protocol** **2.3. Interpretation** **2.3.1. Any reference to a clause in any section of this Market Manual shall refer to the particular clause of the same section in which the reference is**	**2.2 References** **This Manual shall be read in association with the following** ~~a.~~ **WESM Rules and other relevant Market Manuals.** ~~b. WESM Price Determination Methodology~~ ~~c. WESM Dispatch Protocol~~ **2.3. Interpretation** **2.3.1. Any reference to a clause in any section of this Market Manual shall refer to the particular clause of the same section in which the reference is made, unless otherwise specified or the context provides otherwise.**	•

Title	Section	Original Provision	Proposed Amendments	RCC Adopted Amendments	Rationale
			made, unless otherwise specified or the context provides otherwise. 2.3.2. Where there is a discrepancy or conflict between this Manual and the WESM Rules, the WESM Rules shall prevail. 2.3.3. Standards and policies appended to, or referenced in, this Manual shall provide a supporting framework.	2.3.2. Where there is a discrepancy or conflict between this Manual and the WESM Rules, the WESM Rules shall prevail. 2.3.3. Standards and policies appended to, or referenced in, this Manual shall provide a supporting framework.	
Responsibilities	3	3.1 The MO will be responsible for the development, validation, maintenance, publication and revision of this document in coordination with Trading Participants and the System Operator. 3.2 The SO will provide the necessary information and references for subsequent revisions and validation of this document. 3.3 Trading participants will provide the necessary information and references for subsequent revisions and validation of this document. 3.4 The PEM Board will be responsible for the approval of this document and subsequent revisions and issuances.	3.1 Market Operator 3.1.1 The ~~MO~~ Market Operator shall ~~will~~ be responsible for the development, validation, maintenance, publication and revision of this ~~document~~Market Manual in coordination with Trading Participants and the System Operator. 3.1.2. The Market Operator shall implement the principles and processes provided in this Market Manual. 3.2 System Operator 3.2.1The ~~SO will~~System Operator shall provide the necessary information and references for the implementation and subsequent revisions and validation of this ~~document~~Market Manual. 3.3 Trading Participants 3.3.1 Trading participants ~~will~~shall provide the necessary information and references for the implementation and subsequent revisions and validation of this ~~document~~Market Manual, particularly in	3.1 Market Operator The ~~MO~~ Market Operator shall ~~will~~ be responsible for the development, validation, maintenance, publication in the Market Information Web Site and revision of this ~~document~~Market Manualin coordination with Trading Participants and the System Operator. 3.2 System Operator The ~~SO will~~System Operator shall provide the necessary information and references for the implementation and subsequent revisions and validation of this ~~document~~Market Manual. 3.3 Trading Participants Trading participants ~~will~~shall provide the necessary information and references for the implementation and subsequent revisions and validation of this ~~document~~Market Manual, which include, but is not limited to the establishment of nodal load shedding or nodal value of loss load (VOLL) values.	•

Title	Section	Original Provision	Proposed Amendments	RCC Adopted Amendments	Rationale
			the establishment of nodal load shedding or nodal value of loss load (VOLL) values. ~~3.4 The PEM Board will be responsible for the approval of this document and subsequent revisions and issuances.~~	~~3.4 The PEM Board will be responsible for the approval of this document and subsequent revisions and issuances.~~	
Constraint Violation Coefficient in the MDOM	4	4 Constraint Violation Coefficient in the MDOM	4 Constraint Violation Coefficient ~~in the MDOM~~ **4.1 Scope** **4.1.1. This section provides the values of the constraint violation coefficients and the priority order of soft constraints that can be relaxed considering their constraint violation coefficients so that the market dispatch optimization model shall always find a solution** **4.1.2. The constraint violation coefficients shall be set for market dispatches to ensure that the market dispatch optimization model shall always find a solution which satisfies all constraints, if such a solution exists; and the violated constraints are prioritized, such that the network elements, loads and generating units are physically feasible and reflect the priorities or how the System Operator should manage system security and reliability. [6]** (*Footnote***6: WESM Rules Clause 3.6.2.1**) **4.1.3. The constraint violation coefficients shall also be set for market pricing re-runs to ensure that the dispatches of all network elements, loads and generating units produced**	4 Constraint Violation Coefficient ~~in the MDOM~~ **4.1 Scope** **4.1.1. This section provides the values of the constraint violation coefficients and the order of relaxing soft constraints considering their constraint violation coefficients so that the market dispatch optimization model shall always find a solution.** **4.1.2. The constraint violation coefficients shall be set for market dispatches to ensure that the market dispatch optimization model shall always find a solution which satisfies all constraints, if such a solution exists; and the violated constraints are prioritized, such that the network elements, loads and generating units are physically feasible and reflect the priorities or how the System Operator should manage system security and reliability. [6]** (Footnote**6: WESM Rules Clause 3.6.2.1**) **4.1.3. The constraint violation coefficients shall also be set for market pricing re-runs to ensure that:** **a) The dispatches of all network elements, loads and generating units produced by the market optimization algorithm are**	• Provide details on soft constraints, for clarity • Renumbering

Title	Section	Original Provision	Proposed Amendments	RCC Adopted Amendments	Rationale
		The following will constitute the CVC in the MDOM: (a) Deficit Interruptible Load Reserve - This signals insufficient Interruptible Load reserve, when the Interruptible Load reserve that may be scheduled is below the Interruptible Load requirements. Operationally interruptible loads can be compensated by sufficient dispatchable reserves and hence will not provide significant risk in the power system even if the interruptible load requirement is not met. (b) Deficit Dispatchable Reserve - This signals insufficient dispatchable reserve, when the dispatchable reserve that may be scheduled is below the dispatchable reserve requirements. Deficit dispatchable reserve may be compensated by sufficient interruptible load. (c) Deficit Regulating Reserve – This signals insufficient regulation reserve when the regulation reserve that may be scheduled is below the regulation requirements. It is of utmost importance that this type of service be always available, even in cases of insufficient supply in compensating for the energy requirement.	**by the market optimization algorithm are approximately the same as the original market dispatches; and the prices produced by the market optimization algorithm shall be appropriate in all the circumstances, taking into consideration the processes defined in WESM Rules Clauses 3.6.7 and 3.10 to adjust or override those prices for market projection, dispatch, and settlement purposes when there are instances of non-zero constraint violation variable values.** [7] (*Footnote* **7: WESM Rules Clause 3.6.2.2**) **4.2 Soft Constraints** The following ~~will constitute the CVC~~**soft constraints may be relaxed** in the ~~MDOM~~**market dispatch optimization model and shall have an associated constraint violation coefficient**: ~~(a) Deficit Interruptible Load Reserve - This signals insufficient Interruptible Load reserve, when the Interruptible Load reserve that may be scheduled is below the Interruptible Load requirements. Operationally interruptible loads can be compensated by sufficient dispatchable reserves and hence will not provide significant risk in the power system even if the interruptible load requirement is not met.~~ ~~(b) Deficit Dispatchable Reserve - This signals insufficient dispatchable reserve, when the dispatchable reserve that may~~	**approximately the same as the original market dispatches; and** **b) The prices produced by the market optimization algorithm shall be appropriate in all the circumstances, taking into consideration the processes defined in WESM Rules Clauses 3.6.7 and 3.10 to adjust or override those prices for market projection, dispatch, and settlement purposes when there are instances of non-zero constraint violation variable values.** [7] (Footnote**7: WESM Rules Clause 3.6.2.2**) **4.2 Soft Constraints** The following ~~will constitute the CVC~~**soft constraints may be relaxed** in the ~~MDOM~~**market dispatch optimization model and shall have an associated constraint violation coefficient**: ~~(a) Deficit Interruptible Load Reserve - This signals insufficient Interruptible Load reserve, when the Interruptible Load reserve that may be scheduled is below the Interruptible Load requirements. Operationally interruptible loads can be compensated by sufficient dispatchable reserves and hence will not provide significant risk in the power system even if the interruptible load requirement is not met.~~ ~~(b) Deficit Dispatchable Reserve - This signals insufficient dispatchable reserve, when the dispatchable reserve that may be scheduled is below the dispatchable reserve requirements. Deficit dispatchable reserve may be compensated by sufficient interruptible load.~~	

Title	Section	Original Provision	Proposed Amendments	RCC Adopted Amendments	Rationale
		(d) Deficit Contingency reserve – This signals insufficient contingency reserve, when the contingency reserve that may be scheduled is below the contingency requirements. (e) Contingency Constraint - This signals the risk resulting from transmission line overflow during single outage conditions. Similar to Base Case Constraint, deficiency leading to a line flow violation could alternatively result in an artificial nodal violation. (f) Over Generation – This signals the risk of shutting down generators to avoid system over frequency. WESM defines excess generation as generation which may be scheduled to occur in excess of load requirements, even though market energy prices have fallen to the market price floor, and will be dealt with in accordance with clause 3.9.8 of the WESM Rules. Over generation is the opposite of deficit or under generation. (g) Under Generation – This signals the risk of load shedding in the system, as this signifies load is greater than the amount of energy injected to the system. (h) Base Case Constraint – This signals the security risk resulting from transmission line or transformer overflow. Generally the deficiency leading to a line flow violation could alternatively result in a nodal violation – load could be shed at the receiving end rather than violating the flow limits.	~~be scheduled is below the dispatchable reserve requirements. Deficit dispatchable reserve may be compensated by sufficient interruptible load.~~ ~~(c) Deficit Regulating Reserve – This signals insufficient regulation reserve when the regulation reserve that may be scheduled is below the regulation requirements. It is of utmost importance that this type of service be always available, even in cases of insufficient supply in compensating for the energy requirement.~~ ~~(d) Deficit Contingency reserve – This signals insufficient contingency reserve, when the contingency reserve that may be scheduled is below the contingency requirements.~~ **a. Reserve Requirement Constraint, where the total reserve schedules should meet the reserve requirement for a certain reserve category in a certain reserve region. Should this constraint be violated, it signifies that the reserve schedules were unable to meet the reserve requirement. It should be noted that it applies for all reserve types.** **Should these constraints be violated, it signifies that the reserve schedules were unable to meet the reserve requirement.** ~~(e)~~**b. Thermal** Contingency Constraint - ~~This signals the risk resulting from~~**where the power flow through a** transmission ~~line overflow~~**equipment should be within its thermal contingency limit** during	~~(c) Deficit Regulating Reserve – This signals insufficient regulation reserve when the regulation reserve that may be scheduled is below the regulation requirements. It is of utmost importance that this type of service be always available, even in cases of insufficient supply in compensating for the energy requirement.~~ ~~(d) Deficit Contingency reserve – This signals insufficient contingency reserve, when the contingency reserve that may be scheduled is below the contingency requirements.~~ **a. Reserve Requirement Constraint, where the total reserve schedules should meet the reserve requirement for a certain reserve category in a certain reserve region.** ~~(e)~~**b. Thermal** Contingency Constraint - ~~This signals the risk resulting from~~**where the power flow through a** transmission ~~line overflow~~**equipment should be within its thermal contingency limit** during ~~single~~**N-1** outage conditions. ~~Similar to Base Case Constraint, deficiency leading to a line flow violation could alternatively result in an artificial nodal violation.~~ **c. Self-Scheduled Generation Constraint, where the dispatch target of preferential dispatch and non-scheduled generating units shall be equal to their projected output or schedule of loading level, respectively.** **d. Thermal Base Case Constraint, where the power flow through a transmission**	

Title	Section	Original Provision	Proposed Amendments	RCC Adopted Amendments	Rationale
		In reality, the best way to manage this risk is for load to be shed at the receiving end of the line rather than risking overloading the lines to a point where it is burnt out, resulting in greater disruption to the transmission system and the economy. (i) Transmission Constraint Group (TCG) Constraint – This signals risks to the power transfer capability between regions in the transmission system. TCGs pertain branch groups or interconnection between regions in the power system. (j) Nodal VoLL - This signals risks to localized shedding of load due to line or transformer loading limitations.	~~single~~**N-1** outage conditions. **Should this constraint be violated, it means that the results reflect that the power flow through a transmission equipment exceeded its contingency limit during N-1 outage conditions.** ~~Similar to Base Case Constraint, deficiency leading to a line flow violation could alternatively result in an artificial nodal violation.~~ **c. Self-Scheduled Generation Constraint, where the dispatch target of preferential dispatch and non-scheduled generating units shall be equal to their projected output or schedule of loading level, respectively. Should this constraint be violated, it means that the projected output or schedule of loading level of the relevant generating unit(s) shall be curtailed. If there is more than one generating unit to be curtailed, the curtailment scheme shall follow the methodology defined in the WESM Price Determination Methodology.** **d. Thermal Base Case Constraint, where the power flow through a transmission equipment should be within its normal (base case) limit. Should this constraint be violated, it means that the results reflect that the power flow through a transmission equipment exceeded its normal limit.** ~~(i)~~**e.** Transmission ~~Constraint~~ Group ~~(TCG)~~ Constraint – ~~This signals risks to the power transfer capability between regions in the transmission system. TCGs pertain~~ **,where the power flow through a** branch ~~groups~~**group** or **an**	**equipment should be within its normal (base case) limit.** ~~(i)~~**e.** Transmission ~~Constraint~~ Group ~~(TCG)~~ Constraint – ~~This signals risks to the power transfer capability between regions in the transmission system. TCGs pertain~~ **,where the power flow through a** branch ~~groups~~**group** or **an** interconnection ~~between regions in the power system~~**equipment between grids (i.e. HVDC links) should be within its normal limits.** **f. System Energy Balance Constraint, where the total generation scheduled should meet the demand requirement.** ~~j)~~**g.** Nodal VoLL **or Nodal Energy Balance Constraint**~~- This signals risks to~~**, where the power going into a node should be equal to the power going outside of the same node. This constraint also refers to the nodal energy balance constraint, which may vary from node to node, and/or be set so as to reflect load shedding priorities.[8]** (Footnote **8: WESM Rules Clause 3.6.2.3)**	

Title	Section	Original Provision	Proposed Amendments	RCC Adopted Amendments	Rationale
			interconnection ~~between regions in the power system~~**equipment between grids (i.e. HVDC links) should be within its normal limits. Should this constraint be violated, it means that the power flow through a branch group or HVDC link exceeded its normal limits.** ~~(f) Over Generation – This signals the risk of shutting down generators to avoid system over frequency. WESM defines excess generation as generation which may be scheduled to occur in excess of load requirements, even though market energy prices have fallen to the market price floor, and will be dealt with in accordance with clause 3.9.8 of the WESM Rules. Over generation is the opposite of deficit or under generation.~~ ~~(g) Under Generation – This signals the risk of load shedding in the system, as this signifies load is greater than the amount of energy injected to the system.~~ **f. System Energy Balance Constraint, where the total generation scheduled should meet the demand requirement. Should this constraint be violated, it could be either that the total generation scheduled is beyond the demand requirement (over-generation), or there is a generation deficit, or the total generation scheduled is unable to meet the demand requirement (under-generation).** ~~(h) Base Case Constraint – This signals the security risk resulting from transmission line or transformer overflow. Generally the deficiency leading to a line~~		

Title	Section	Original Provision	Proposed Amendments	RCC Adopted Amendments	Rationale
			~~flow violation could alternatively result in a nodal violation – load could be shed at the receiving end rather than violating the flow limits. In reality, the best way to manage this risk is for load to be shed at the receiving end of the line rather than risking overloading the lines to a point where it is burnt out, resulting in greater disruption to the transmission system and the economy.~~ ~~(i)~~**g.** Nodal VoLL **or Nodal Energy Balance Constraint**~~- This signals risks to,~~ **where the power going into a node should be equal to the power going outside of the same node. This constraint also refers to the nodal energy balance constraint, which may vary from node to node, and/or be set so as to reflect load shedding priorities.[8] Should this constraint be violated, it means that the there is load sheeding in the node** ~~transformer loading limitations~~ **due to either a deficit in generation, or due to a thermal constraint**. **(***Footnote* **8: WESM Rules Clause 3.6.2.3)**		
Constraint Violation Coefficient for Nodal Energy Balance Equations (Nodal VoLL)	5	5 Constraint Violation Coefficient for Nodal Energy Balance Equations (Nodal VoLL) xxx	~~5 Constraint Violation Coefficient for Nodal Energy Balance Equations (Nodal VoLL)~~ ~~Xxx~~	~~5 Constraint Violation Coefficient for Nodal Energy Balance Equations (Nodal VoLL)~~ ~~Xxx~~	• Deleted section, which is already covered in Section 4.1
Constraint Violation Coefficient Development	6	6 Constraint Violation Coefficient Development	~~6~~**4.3 Priority Order of** Constraint Violation Coefficient~~s Development~~	~~6~~**4.3 Order of** Constraint Violation Coefficient~~s Development~~	• Assumption of the hierarchy includes the modelling of distribution networks that affect market outcomes.

Title	Section	Original Provision	Proposed Amendments	RCC Adopted Amendments	Rationale
		6.1 Based on Section 4 above and in consultation with SO, the following will be the revised priority order of the CVCs in an ascending manner: 6.1.1 Base Case Constraint 6.1.2 TCG Constraint 6.1.3 Deficit Regulating Reserve 6.1.4 Under Generation / Over Generation 6.1.5 Nodal VoLL 6.1.6 Contingency Constraint 6.1.7 Deficit Contingency Reserve 6.1.8 Deficit Dispatchable Reserve 6.1.9 Deficit Interruptible Load	**4.3.1 The priority order of soft constraints shall be set such that constraints resulting in the lowest reduction in the capability of the network, load or generating units shall be allowed to occur first. A soft constraint with a higher priority shall be the last constraint to be violated.** ~~6.1~~**4.3.2** ~~Based on Section 4 above and in consultation with SO, the~~**The** ~~will be the revised~~ priority order **of soft constraints, from highest to lowest priority,** ~~of the CVCs in an ascending manner~~ **shall be as follows**: ~~6.1.1~~**a. Thermal** Base Case Constraint ~~6.1.2~~**b.** ~~TCG~~**Transmission Group** Constraint ~~6.1.3~~ **c.** ~~Deficit~~ Regulating Reserve **Requirement Constraint** **d. Thermal Contingency Constraint** **e. Self-scheduled Generation Constraint** ~~6.1.4Under Generation / Over Generation~~ ~~6.1.5Nodal VoLL~~ **f. System Energy Balance Constraint** ~~6.1.6Contingency Constraint~~ **g. Nodal VoLL or Nodal Energy Balance Constraint** ~~6.1.7~~ **h.** ~~Deficit~~**Fast** Contingency Reserve **Requirement Constraint** ~~6.1.8~~ **i.**~~Deficit Dispatchable~~**Slow Contingency** Reserve **Requirement Constraint** ~~6.1.9~~**j.**~~Deficit Interruptible Load~~**Delayed Contingency Reserve Requirement Constraint** ~~6.2 Gradation Levels between CVCs~~	**4.3.1 The order of relaxing soft constraints shall be set such that constraints resulting in the lowest reduction in the capability of the network, load or generating units shall be allowed to occur first, as follows:** **a. Delayed Contingency Reserve Requirement Constraint** **b. Slow Contingency Reserve Requirement Constraint** **c. Fast Contingency Reserve Requirement Constraint** **d. Nodal VoLL or Nodal Energy Balance Constraint** **e. System Energy Balance Constraint** **f. Self-scheduled Generation Constraint** **g. Thermal Contingency Constraint** **h. Regulating Reserve Requirement Constraint** **i. Transmission Group Constraint** **j. Thermal Base Case Constraint** ~~6.1 Based on Section 4 above and in consultation with SO, the following will be the revised priority order of the CVCs in an ascending manner:~~ ~~6.1.1 Base Case Constraint~~ ~~6.1.2 TCG Constraint~~ ~~6.1.3 Deficit Regulating Reserve~~ ~~6.1.4 Under Generation / Over Generation~~ ~~6.1.5 Nodal VoLL~~ ~~6.1.6 Contingency Constraint~~ ~~6.1.7 Deficit Contingency Reserve~~ ~~6.1.8 Deficit Dispatchable Reserve~~ ~~6.1.9 Deficit Interruptible Load~~	• For clarity

Title	Section	Original Provision	Proposed Amendments	RCC Adopted Amendments	Rationale
		6.2 Gradation Levels between CVCs The initial value of the Deficit Interruptible Load, which is of the lowest priority, was set at CVC of 100,000, an assigned value that is far from any values that may be derived in the WESM. As such, the priority order shall start at the original value for Deficit Interruptible Load with 100,000. Sufficient grading in between CVCs are made so that the pre-defined order of violation priority is maintained, and to resolve possible dispatch conflicts between the different constraint types should they occur simultaneously. Section 8 details the priority order of the CVC and their corresponding CVC values.	**4.3.3 The priority order of soft constraints shall be established in the market dispatch optimization model through the values of the constraint violation coefficients, which shall be set as far from any market clearing price values that may be derived in the WESM.** ~~The initial value of the Deficit Interruptible Load, which is of the lowest priority, was set at CVC of 100,000, an assigned value that is far from any values that may be derived in the WESM. As such, the priority order shall start at the original value for Deficit Interruptible Load with 100,000.~~ **4.3.4 There shall be sufficient**~~Sufficient~~grading in between ~~CVCs~~**constraint violation coefficients** ~~are made so that~~**to maintain** the pre-defined order of ~~violation~~ priority ~~is maintained,~~ and ~~to~~ resolve possible dispatch conflicts between the different constraint types should they occur simultaneously. ~~Section 8 details the priority order of the CVC and their corresponding CVC values.~~	**4.3.2 The order of soft constraints shall be established in the market dispatch optimization model through the values of the constraint violation coefficients, which shall be set significantly greater than any market clearing price values that may be derived in the WESM.** ~~6.2 Gradation Levels between CVCs~~ ~~The initial value of the Deficit Interruptible Load, which is of the lowest priority, was set at CVC of 100,000, an assigned value that is far from any values that may be derived in the WESM. As such, the priority order shall start at the original value for Deficit Interruptible Load with 100,000.~~ **4.3.3 There shall be sufficient**~~Sufficient~~grading in between ~~CVCs~~**constraint violation coefficients** ~~are made so that~~**to maintain** the pre-defined order of ~~violation~~ priority ~~is maintained,~~ and ~~to~~ resolve possible dispatch conflicts between the different constraint types should they occur simultaneously. ~~Section 8 details the priority order of the CVC and their corresponding CVC values.~~	
Constraint Violation Coefficient Application Strategy in the WESM	7	7 Constraint Violation Coefficient Application Strategy in the WESM xxx	~~7 Constraint Violation Coefficient Application Strategy in the WESM~~ ~~Xxx~~	~~7 Constraint Violation Coefficient Application Strategy in the WESM~~ ~~Xxx~~	Deleted obsolete provisions.
Constraint Violation Coefficients Table	8	8 Constraint Violation Coefficients Table The following table lists the Constraint Violation Coefficient names and their corresponding price and order of	~~8 Constraint Violation Coefficients Table~~ **4.3.5** The following table ~~lists~~**provides** the ~~Constraint Violation Coefficient names~~**different soft constraints,** ~~and~~	~~8 Constraint Violation Coefficients Table~~ **4.3.4** The following table ~~lists~~**provides** the ~~Constraint Violation Coefficient names and their corresponding price and~~	• Renumbering • For clarity

Title	Section	Original Provision	Proposed Amendments	RCC Adopted Amendments	Rationale
		priority. The corresponding action by SO regarding the CVC is also indicated.	their corresponding ~~price and order~~**constraint violation coefficients, which is reflective** of **the** priority **order established in this Market Manual** ~~The the~~corresponding action by **the System Operator.** ~~SO regarding the CVC is also indicated.~~ **Table 1. Priority Order and Constraint Violation Coefficients of Soft Constraints**	~~order~~**constraint violation coefficients, which is reflective** of **the** ~~priority~~ **order of relaxing soft constraints established in Section 4.3.1 of this Market Manual, and** ~~The~~ **the** corresponding action by **the System Operator.** ~~SO regarding the CVC is also indicated.~~ **Table 1. Order of Constraint Violation Coefficients**	

Provision					Provision				
Priority	Constraint Violation Coefficient Name	CVC	Definition	Action to be Undertaken	~~Priority~~**Order**	Constraint Violation Coefficient Name	CVC	~~Definition~~	**SO** Action ~~to be Undertaken~~
1	Base Case Constraint	1,500,000	Thermal loading limit violations of lines or transformers	Possible overloadingshould be addressed by Re-dispatch generation and drop load if necessary.	1	~~Base Case Constraint~~ **Delayed Contingency Reserve Requirement**	~~1,500,000~~ **100,000**	~~Thermal loading limit violations of lines or transformers~~	~~Possible overloadingshould be addressed by Re-dispatch generation and drop load if necessary.~~ **Automatic load drop to cover for loss of generation if contingency reserve is insufficient.**
2	TCG Constraint	1,400,000	Import/Export constraints between areas.	Possible overloading should be addressed by Re-dispatch generation and drop load if necessary.	2	~~TCG Constraint~~ **Deficit Slow Contingecy Reserve Requirement**	~~1,400,000~~ **200,000**	~~Import/Export constraints between areas.~~	~~Possible overloading should be addressed by Re-dispatch generation and drop load if necessary.~~ **Automatic load drop to cover for loss of generation if contingency reserve is insufficient.**
3	Deficit Regulating Reserve	1,300,000	Insufficient capacity to meet Regulating Reserve Requirements	Larger frequency excursions are expected without regulating reserve. Lower power quality of service.	3	~~Deficit Regulating Reserve~~ **Deficit Fast Contingency Reserve Requirement**	~~1,300,000~~ **400,000**	~~Insufficient capacity to meet Regulating Reserve Requirements~~	~~Larger frequency excursions are expected without regulating reserve. Lower power quality of service.~~ **Automatic load drop to cover for loss of generation if contingency reserve is insufficient.**
4	Over Generation	(1,000,000)	The total minimum generation in the system exceeds the total demand	Identify generating units to be shutdownto eliminate excess capacity.	4	~~Over Generation~~ **Nodal Value of Lost Load or Nodal Energy Balance Constraint**	~~(1,000,000)~~ **800,000**	~~The total minimum generation in the system exceeds the total demand~~	~~Identify generating units to be shutdownto eliminate excess capacity.~~ **Re-dispatch generation and/or drop load as necessary.**

Provision					Provision				
Priority	Constraint Violation Coefficient Name	CVC	Definition	Action to be Undertaken	~~Priority~~**Order**	Constraint Violation Coefficient Name	CVC	~~Definition~~	**SO** Action ~~to be Undertaken~~
	Under Generation	1,000,000	The demand exceeds the total maximum generation in the system	Implement Manual load dropping to ensure the balance of supply and demand.		~~Under Generation~~	~~1,000,000~~	~~The demand exceeds the total maximum generation in the system~~	~~Implement Manual load dropping to ensure the balance of supply and demand.~~
5	Nodal Value of Lost Load	800,000	Deficiency in supply due to localized violations on line or transformer loading limitations	Marginal overloads (i.e., <110% for 1 hour) should be addressed to eliminate possible overloading on the remaining lines or transformers during contingency occurrence, otherwise, drop local loads.	5	~~Nodal Value of Lost Load~~ **System Energy Balance Constraint**	~~800,000~~ **1,300,000**	~~Deficiency in supply due to localized violations on line or transformer loading limitations~~	~~Marginal overloads (i.e., <110% for 1 hour) should be addressed to eliminate possible overloading on the remaining lines or transformers during contingency occurrence, otherwise, drop local loads.~~ **For over-generation, identify generating units to be shut down to eliminate excess capacity.** **For under-generation, identify must-run units that can be dispatched or drop load as necessary.**
6	Contingency	400,000	Violation in pre-defined contingency limits during single-outage conditions (n-1)	Implement necessary re-dispatch and possible manualload dropping to prevent overloading on the remaining lines or transformers	6	~~Contingency~~ **Self-Scheduled Generation Constraint**	~~400,000~~ **1,400,000**	~~Violation in pre-defined contingency limits during single-outage conditions (n-1)~~	~~Implement necessary re-dispatch and possible manualload dropping to prevent overloading on the remaining lines or transformers~~ **The projected output or schedule of loading level of the relevant generating unit(s) shall be curtailed**
7	Deficit Contingency Reserve	300,000	Insufficient capacity to meet Contingency Reserve Requirements	Delayed restoration of affected automaticload dropping (ALD) feeders due toloss of generation if contingency reserve is insufficient.	7	~~Deficit Contingency Reserve~~ **Thermal Contingency Constraint**	~~300,000~~ **2,400,000**	~~Insufficient capacity to meet Contingency Reserve Requirements~~	**Re-dispatch generation and/or drop load as necessary.** ~~Delayed restoration of affected automaticload dropping (ALD) feeders due toloss of generation if contingency reserve is insufficient.~~
8	Deficit Dispatchable Reserve	200,000	Insufficient capacity to meetDispatchable Reserve Requirements	The contingency reserve when depleted cannot be replenished by Dispatchable Reserve if not sufficient	8	~~Deficit Dispatchable Reserve~~ **Deficit Regulating Reserve Requirement**	~~200,000~~ **2,800,000**	~~Insufficient capacity to meetDispatchable Reserve Requirements~~	**Re-dispatch generation and/or drop load as necessary.** ~~The contingency reserve when depleted cannot be replenished by Dispatchable Reserve if not sufficient~~
9	Deficit Interruptible Load Reserve	100,000	Insufficient capacity to meet the Interruptible Reserve Requirement	Same function as Dispatchable reserve	9	~~Deficit Interruptible Load Reserve~~ **Transmission Group Constraint**	~~100,000~~ **2,900,000**	~~Insufficient capacity to meet the Interruptible Reserve Requirement~~	**Re-dispatch generation and/or drop load as necessary**. ~~Same function as Dispatchable reserve~~

Provision					Provision				
Priority	Constraint Violation Coefficient Name	CVC	Definition	Action to be Undertaken	~~Priority~~Order	Constraint Violation Coefficient Name	CVC	~~Definition~~	SO Action ~~to be Undertaken~~
	NEW				10	Thermal Base Case Constraint	3,000,000		Re-dispatch generation and/or drop load as necessary.

Title	Section	Original Provision	RCC Adopted Amendments	Rationale
		NEW	4.3.5. The Market Operator shall publish all non-zero constraint violation variables in the Market Information Web Site.	• For transparency.
		NEW	4.4 Submission of Report to the DOE and ERC The Market Operator shall submit a semi-annual report to the DOE and ERC on the incidences and causes of constraint violations in the WESM.	• Reflect current requirement of the ERC and actual submission of PEMC of semi-annual reports on CVCs to the ERC. Proposal is to also provide DOE copy of the report.
Constraint Violation Coefficient Review and Audit	9	9 Constraint Violation Coefficient Review and Audit xxx	~~9 Constraint Violation Coefficient Review and Audit~~ ~~xxx~~	• Audit of CVC is already covered in the market audits under Clause 5.2.6 of the WESM Rules.
		NEW	5 Automatic Pricing Re-runs	• Consistent with the proposed amendments to the WESM Rules on WESM enhancements to design and operations
		NEW	5.1. Rationale for Automatic Pricing Re-Runs 5.1.1. At all times, the market dispatch optimization model shall find a solution considering the order of the constraint violation coefficients in Section 4 of this Market Manual. 5.1.2. Should the market dispatch optimization model result in one or more non-zero constraint violation variable values, then the dispatch schedules shall remain the same, but the prices for energy and reserves shall be determined from an automatic re-run of the market dispatch optimization model with relaxed constraints[9]. (Added footnote 9: WESM Rules Clause 3.6.7.1) 5.1.3. The purpose of the automatic pricing re-runs is to ensure that the energy and reserve prices reflect:[10]	Consistent with the proposed amendments to the WESM Rules on WESM enhancements to design and operations •

Title	Section	Original Provision	RCC Adopted Amendments	Rationale
			(Added footnote 10: WESM Rules Clause 3.6.7.2) a. the marginal costs of supplying energy at each node; b. the marginal costs of supplying reserves; c. shortage pricing when there is a shortage of supply at a node or regional level; and d. excess pricing when there is an excess of supply at a node or regional level.	
		NEW	5.2. Process for Automatic Pricing Re-Runs 5.2.1. During the automatic pricing re-run, the soft constraint that was violated shall be relaxed using the resulting non-zero violation variable, considering a very small value (delta), to allow the market dispatch optimization model to be able to find a feasible price. 5.2.2. In case of over-generation and under-generation, the soft constraint shall be relaxed by a very small value (delta) to allow the market dispatch optimization model to find a feasible price. When the results of the market dispatch optimization model reflect a violation greater than delta, then the automatic pricing re-run shall reflect the shortage price for under-generation and excess price for over-generation. 5.2.3. The delta shall be set as small as possible for each constraint violation coefficient so that the automatic pricing re-run shall be reflective of the most accurate price considering the original dispatch schedules. 5.2.4. An example related to Section 5.2.1, is provided below: Should a thermal contingency constraint violation occur: Contingency Power flow < Thermal contingency limit + x Where:	Consistent with the proposed amendments to the WESM Rules on WESM enhancements to design and operations

Title	Section	Original Provision	RCC Adopted Amendments	Rationale
			Contingency Power flow refers to the power flow through an equipment during an N-1 outage scenario x refers to the violation amount in MW Thermal contingency limit refers to the maximum transmission limit during an N-1 outage scenario Then, its constraint shall be relaxed during the automatic pricing re-run similar to the formula below: Contingency Power flow < Thermal contingency limit + x + delta 5.2.5. The resulting prices during an automatic pricing re-run shall be produced in the real time dispatch, along with the original real time dispatch schedules produced prior to the relaxation.	
		NEW	5.3. Automatic Pricing Re-Run Parameters 5.3.1. The corresponding constraint relaxation formulas for the constraint violation coefficients during pricing re-runs shall be as provided in Table 2 below: Table 2. Automatic Pricing Re-Run Parameters	Consistent with the proposed amendments to the WESM Rules on WESM enhancements to design and operations

Priority		CVC	Violation	Delta	Constraint Relaxation during Pricing Re-Run	CVC Value in Pricing Re-Run[11]	Comments
1	Deficit Delayed Contingency Reserve Requirement	100,000	X	0.1	x + delta	EDP AND RP	
2	Deficit Slow Contingency Reserve Requirement	200,000	X	0.1	x + delta	EDP AND RP	
3	Deficit Fast Contingency Reserve Requirement	400,000	X	0.1	x + delta	EDP AND RP	
4	Nodal Energy Balance Constraint	800,000	X	0.1	x + delta	EDP AND RP	
5	System Energy Balance Constraint	1,300,000	X	0	delta	Excess Price for over-generation	

Priority		CVC	Violation	Delta	Constraint Relaxation during Pricing Re-Run	CVC Value in Pricing Re-Run[11]	Comments
						Shortage Price for under-generation	
6	Self-Scheduled Generation Constraint	1,400,000	X	0.1	x + delta	EDP AND RP	
7	Thermal Contingency Constraint	2,400,000	X	0.1	x + delta	EDP AND RP	
8	Deficit Regulating Reserve Requirement	2,800,000	X	0.1	x + delta	EDP AND RP	
9	Transmission Group Constraint	2,900,000	X	0.1	x + delta	EDP AND RP	
10	Thermal Base Case Constraint	3,000,000	X	0.1	x + delta	EDP AND RP	

Title	Section	Original Provision	Proposed Amendments	Rationale
		NEW	6 Market Pricing Re-Runs to Address Pricing Errors	• Consistent with the proposed amendments to the WESM Rules on WESM enhancements to design and operations • To provide process for price discovery during pricing errors due to bad input data.
		NEW	6.1. Guidelines for Issuance of Pricing Error Notices and Conduct of Manual Pricing Re-Runs 6.1.1. In the event where the calculated prices are believed to be in error, notwithstanding the application of automatic pricing re-run under clause WESM Rules Clause 3.6.7.1, the Market Operator may issue a pricing error notice[12]. (Added footnote 12: WESM Rules Clause 3.10.5.1) 6.1.2. Upon issuance of a pricing error notice, the Market Operator shall, as soon as practicable, implement a market pricing re-run[13], also referred to as manual pricing re-run in this Market Manual. (Added footnote 13: WESM Rules Clause 3.10.5.2) 6.2 Issuance and Publication of Pricing Error Notices	• Consistent with the proposed amendments to the WESM Rules on WESM enhancements to design and operations • To provide process for price discovery during pricing errors due to bad input data.

Title	Section	Original Provision	Proposed Amendments	Rationale
			6.2.1. When the pricing error occurs, the Market Operator shall issue pricing error notices to the Trading Participants, within the trading day. Pricing error notices shall be issued to Trading Participants by electronic means, or other alternative means where such electronic means is unavailable for any reason. 6.2.2. Within two (2) working days after the trading day when the pricing error occurred, the Market Operator shall publish in the market information website a summary of the pricing error notices issued for that trading day pursuant to this Market Manual. 6.2.3 Where a pricing error notice has been issued but the Market Operator determines after validation that no pricing error actually occurred as the criteria set forth in this Market Manual is not met, the Market Operator shall issue an advisory to all Trading Participants informing them of the correction. 6.2.4 Likewise, where no pricing error notice has been issued but the Market Operator determines after validation that pricing error actually occurred, the Market Operator shall issue the pricing error notice prior to the issuance of the preliminary settlement statement for the relevant billing period. 6.3 Process for Manual Pricing Re-Runs 6.3.1. The Market Operator shall perform the manual pricing re-run using the same set of input data used in the original real time dispatch market run, with corresponding adjustments or corrections as may be appropriate depending on the cause of the pricing error. 6.3.2. In performing the manual pricing re-run, the Market Operator shall determine the appropriate solution that shall be applied in the manual pricing re-run taking into consideration the applicable solutions for the various causes of erroneous, inconsistent and inappropriate input data, as provided in Table 3 below:	

Title	Section	Original Provision	Proposed Amendments	Rationale
			Table 3. Manual Pricing Re-run Conditions and Solutions	

1	Bad and non-updating system snapshot/state estimator data (breaker status, load levels, etc.)	Bad breaker status may cause isolation of loads and generators or islanding of a group of nodes. The system snapshot/ state estimator data normally contains bad data thus only intervals with isolated loads exceeding the forecast tolerance limits with respect to the total demand or those that result to congestion is issued with pricing error.	Identify the affected load, generator or equipment and reflect the actual generation/load values or status (as necessary) in the market pricing re-run.
2	Errors resulting from limitations of Market Network modelling	Arise when there is inconsistency between the Market Network Model and the actual power system network	Identify the affected load, generator or equipment and reflect the actual generation/load values or status (as necessary) in the market pricing re-run.

Title	Section	Original Provision	Proposed Amendments	Rationale
		NEW	6.3.3. If the results of the manual pricing re-run indicate nodal price separation that is due to congestion, then the methodology provided for in the relevant Market Manual shall apply. Otherwise, the prices from the manual pricing re-run shall be used for settlement pursuant to WESM Rules Clause 3.10.5. 6.3.4. Manual pricing re-runs shall be performed and completed within a reasonable time after the relevant dispatch interval, provided that all pricing re-runs shall be completed before the issuance of the final settlement statement for the affected billing period. 6.4 Publication of Manual Pricing Re-Run Results 6.4.1. After each billing period and upon completion of all manual pricing re-runs, the following information shall be published by the Market Operator in the Market Information Web Site and disseminated to all Trading Participants:	• For transparency

Title	Section	Original Provision	Proposed Amendments	Rationale
			a. Complete list of the pricing errors that occurred during the billing period, indicating clearly the affected dispatch intervals, including those instances where no pricing error was issued within the timetable; and b. Results of the manual pricing re-run, including the resulting market prices.	
		NEW	**SECTION 7 AMENDMENT, PUBLICATION AND EFFECTIVITY** **7.1 Review and Update** **The Market Operator, in coordination with the System Operator, and in consultation with the WESM Members shall regularly review the following:** **a) Appropriateness and applicability of constraint violation variables and their associated constraint violation coefficient levels and revise as maybe necessary to ensure that it reflects the actual conditions of the network;[14]** (Added footnote **14**: **WESM Rules Clause 3.6.2.5**) **This Market Manual or any amendments there to shall be approved, published, and deemed effective in accordance with Chapter 8 of the WESM Rules and corresponding Market Manual.**	• Consistent with the DOE-approved changes to the rules change process under Chapter 8 of the WESM Rules.
Constraint Violation Coefficient Publication and Application	10	10. Constraint Violation Coefficient Publication and Application 10.1 During the Market Trials and Prior to the start of the commercial operation of the WESM, the MO will notify all participants of the CVCs used in the MDOM and publish the CVCs in the WESM website. 10.2 Reports pertaining to the review and audit of the CVCs will be published in the WESM website upon completion. 10.3 Should the PEM Board approve any changes in the CVCs, the MO will publish the approval and resolution of the PEM Board in the WESM website.	~~10. Constraint Violation Coefficient Publication and Application~~ ~~10.1 During the Market Trials and Prior to the start of the commercial operation of the WESM, the MO will notify all participants of the CVCs used in the MDOM and publish the CVCs in the WESM website.~~ ~~10.2 Reports pertaining to the review and audit of the CVCs will be published in the WESM website upon completion.~~ ~~10.3 Should the PEM Board approve any changes in the CVCs, the MO will publish the approval and resolution of the PEM Board in the WESM website.~~	• Deleted obsolete provisions. • Provision on the approval and revision of CVCs are covered in Section 7.

Title	Section	Original Provision	Proposed Amendments	Rationale
		10.4 Any revision or changes pertaining to the CVCs in the MDOM will take effect 7 days after its publication in the WESM website.	~~10.4 Any revision or changes pertaining to the CVCs in the MDOM will take effect 7 days after its publication in the WESM website.~~	