

**PUBLIC**

## WESM Manual

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# **Criteria and Guidelines for the Issuance of Pricing Error Notices and Conduct of Market Re-Run Issue 1.0**

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Abstract	This document establishes the criteria and guidelines for issuance of Pricing Error Notices (PEN) and for conducting Market Re-Run (MRR) in the Philippine Wholesale Electricity Spot Market.
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## Document Approval

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## Document Change History

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1.0	PEMC	18 August 2010	Original document <i>(approved by the PEM Board as Urgent Amendments on 27 October 2010 and as General Amendments on 28 April 2011)</i>

## Related Document

Document ID	Document Title
	WESM Rules, as amended
WESM-CVC-002	WESM Manual: Constraint Violation Coefficient
	Revised Price Determination Methodology in the Philippine Wholesale Electricity Spot Market
WESM-BS-000	WESM Manual: Billing and Settlements
WESM-AP-002	Administered Price Determination Methodology
WESM-MDPEPS-002	WESM Manual: Methodology for Determining Pricing Errors and Price Substitution Due to Congestion for Energy Transactions in the WESM



## Table of Contents

Section	Description	Page
1	Purpose/Rationale	1
2	Scope	2
3	Definitions and References	2
4	Responsibilities	2
5	Categories of Pricing Errors	3
6	Criteria for Determining Occurrence of Pricing Errors	3
7	Guidelines for Performance of Market Re-Runs	5
8	Guidelines for Application of Substitute Prices	6
9	Issuance and Publication of Pricing Error Notices and Market Re-Run Results	8
Appendix A	Non-Exhaustive List of Erroneous, Inconsistent and Inappropriate Input Data that can Result to a Pricing Error	9
Appendix B	Solutions for Various Cases of Non-Congestion Pricing Errors	10

## 1. PURPOSE/RATIONALE

- 1.1. Under WESM Rules clauses 3.10.5 and 3.9.6, the Market Operator may issue pricing error notices in cases where no ex-ante or ex-post prices can be determined or communicated within the timetable or the calculated prices are believed to be in error.
- 1.2. WESM Rules clause 3.10.5 (a) and (b) further provides for the substitute prices that will be used in the settlement of market transactions in the trading intervals where pricing error notices are issued in either the ex-ante or ex-post market runs. Where pricing error notice is issued in the ex-ante market runs, the ex-post prices shall serve as the ex-ante prices. Meanwhile, when no ex-post prices can be determined or the calculated prices are believed to be in error, a re-run (the “market re-run” or “MRR”) of the Market Dispatch Optimization Model shall be performed.
- 1.3. For this purpose, the Market Operator is directed to develop and publish the procedures for the determination of market re-run prices. Such procedures shall provide the criteria and conditions for the market re-run and the timetable for implementation.<sup>1</sup>
- 1.4. Where, however, the resulting market prices are affected by network congestion and extreme nodal price separations, the substitute prices are as provided for in the WESM Manual on “Methodology for Determining Pricing Errors and Price Substitution Due to Congestion for Energy Transactions in the WESM” (the “PSM Manual”) as approved by the Energy Regulatory Commission (the “ERC”).
- 1.5. This Manual establishes the -
  - a) criteria that will guide the Market Operator in determining whether or not the market prices are in error as would warrant the issuance of a pricing error notice (the “PEN”) and the application of the corresponding substitute prices;
  - b) guidelines for the performance by the Market Operator of a re-run of the Market Dispatch Optimization Model (the “market re-run” or the “MRR”) in cases where a pricing error notice is issued for the ex-post market runs;
  - c) guidelines for applying the rules on price substitution as set forth in the WESM Rules and in the PSM Manual; and

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<sup>1</sup> WESM Rules clause 3.10.5 (a) 2<sup>nd</sup> paragraph, as amended by Department of Energy Circular No. DC 2010-03-004 dated 21 March 2010.

- d) guidelines for application of the WESM Rules clauses 3.9.6 and 3.10.5 and this Manual when either the Visayas or the Mindanao grids are integrated in the WESM.

For pricing errors due to network congestion, the guidelines and procedures set forth in this Manual are supplementary to the guidelines and procedures set forth in the PSM Manual.

## **2. SCOPE**

- 2.1. *All Trading Participants and WESM Members and the Market Operator* are covered by the guidelines and procedures set forth in this Manual.
- 2.2. This Manual applies to all regions or regional grids where the WESM is and will be in operation. As used in this Manual, the regions or regional grids refer to Luzon, Visayas and Mindanao.
- 2.3. This Manual applies to pricing errors covered by WESM Rules clauses 3.9.6 and 3.10.5. It also supplements the methodology set forth in the PSM Manual. The latter, however, shall primarily govern the management of network congestion pricing errors as defined in said manual.

## **3. DEFINITIONS AND REFERENCES**

- 3.1. Unless otherwise defined, the terms used in this Manual which are defined in the WESM Rules will bear the same meaning as defined in the WESM Rules.
- 3.2. This should be read in association with the –
  - 3.2.1. WESM Rules
  - 3.2.2. Revised Price Determination Methodology
  - 3.2.3. Administered Price Determination Methodology
  - 3.2.4. WESM Manual: Methodology for Determining Pricing Errors and Price Substitution Due to Congestion for Energy Transactions in the WESM, and associated decisions, orders and resolutions of the ERC
  - 3.2.5. WESM Manual: Constraint Violation Coefficients
  - 3.2.6. WESM Manual: Billing and Settlements

## **4. RESPONSIBILITIES**

- 4.1. The Market Operator shall be responsible for the following –

- 4.1.1. Determination of the occurrence of pricing errors in the ex-ante and ex-post market runs and for the issuance of corresponding pricing errors;
  - 4.1.2. Performance of a re-run of the ex-post market runs where pricing errors are issued; and
  - 4.1.3. Applying the price substitution rules set forth in the WESM Rules clause 3.10.5 and further described in this Manual in the settlement of market transactions in the affected trading intervals.
- 4.2. Amendments to this Manual shall be approved by the Philippine Electricity Market Board (the “PEM Board”) upon endorsement by the WESM Rules Change Committee in accordance with prevailing rules and procedures on amendments of market manuals.

## **5. CATEGORIES OF PRICING ERRORS**

- 5.1. Pricing errors are categorized according to cause, as either –
- 5.1.1. Network congestion pricing errors are those that occur when the nodal prices are affected by network congestion as defined and determined pursuant to the criteria and price trigger set forth in the PSM Manual.
  - 5.1.2. Non-congestion pricing errors are those that occur when there are no ex-ante prices or ex-post prices are determined or communicated within the timetable or when such prices are determined to be in error but are otherwise not classified as network congestion pricing errors under the PSM Manual.
- 5.2. Pricing errors may occur in the ex-ante or ex-post market runs. Pricing error notice shall be issued only for the market run where the pricing error is determined by the Market Operator to have occurred.

## **6. CRITERIA FOR DETERMINING OCCURRENCE OF PRICING ERRORS**

### **6.1. Non-congestion Pricing Errors**

There is non-congestion pricing error where the results of either the market runs show any one of the following conditions –

- 6.1.1. The resulting ex-ante or ex-post prices are reflective of constraint violation coefficients due to occurrence of any one of the following

conditions, as these are defined in the WESM Manual on Constraint Violation Coefficients –

- a) Under-generation constraint
- b) Over-generation constraint
- c) Base case constraint
- d) Contingency constraint
- e) Transmission constraint group
- f) Reserve constraint

For avoidance of doubt, only constraint violation coefficients associated with localized base case, contingency and transmission constraint group constraints are considered as non-congestion pricing errors. Localized constraint refers to constraint that manifests on a radially-connected line or load end transformer, which is the source of the load connected to it, or step-up transformer in a generating plant.

- 6.1.2. The ex-post market run did not generate prices and schedules due to stoppage of, non-completion of or non-convergence in the associated solutions of the ex-post workflows of the WESM Market Management System. For purposes of this Manual, a workflow refers to the sequence of connected processes in the Market Management System that are automatically executed in a pre-determined time frame necessary for derivation of market results. The ex-post workflow refers to the work flow that runs at the top of each trading interval.

There is no pricing error for purposes of application of this Manual, however, when no feasible prices and schedules are generated in the ex-ante market runs. In such case, a market intervention is declared pursuant to Section 6.7.2 of the WESM Rules, and the administered prices determined pursuant to the Administered Price Determination Methodology approved by the ERC shall be used for settlement of transactions for the affected trading interval.

- 6.1.3. Erroneous, inconsistent and inappropriate input data is used in the market runs. Input data includes but is not limited to security limit settings, generation or transmission outage schedules, and system snap shot data. A non-exhaustive list of erroneous, inconsistent or inappropriate input data that can result to a pricing error are presented in Appendix “A” of this Manual. The Market Operator shall, from time to time, publish in the market information website, an updated list of categories of erroneous, inconsistent or inappropriate input data.

- 6.1.4. When the energy flows through the inter-connection between regional grids (e.g. Leyte-Luzon HVDC link) is nominated by the System Operator, and no nomination is submitted by the System Operator, or a

nomination is submitted but the nomination is not met or the nominated flow is inconsistent with the actual flow.

## **6.2. Network Congestion Pricing Errors**

The criteria for determining occurrence of a network congestion pricing error are defined in the PSM Manual and in relevant decisions, orders or resolutions of the ERC approving the PSM or any changes thereto.

## **6.3. Regional Occurrence of Pricing Errors**

6.3.1. If the occurrence of the pricing error is confined to one region and does not affect the other region/s, the pricing error notice shall be issued and the corresponding price substitution shall be applied only in the region where the pricing error occurs.

6.3.2. Where interconnection between two grids exists, a non-congestion pricing error is considered as being confined in one region and is not affecting the other region/s when the market results shows occurrence of any of the following conditions –

- a) The resulting scheduled flow in the interconnection (e.g. Leyte-Luzon HVDC link) is binding or is equal to the value nominated by the System Operator and that the direction of the flow is as nominated and is consistent with the actual flow; or
- b) The contingency constraint violation or base constraint violation is localized and exists in one region only as reflected in the market results.

6.3.3. In the case of network congestion pricing errors, the guidelines and criteria for regional application as set forth in the PSM Manual or in relevant decisions, orders or resolutions of the ERC shall apply.

## **7. GUIDELINES FOR PERFORMANCE OF MARKET RE-RUNS**

7.1. Pursuant to WESM Rules clause 3.10.5, a market re-run is performed to determine substitute prices where a non-congestion pricing error occurs in the ex-post market runs.

7.2. The Market Operator shall perform the market re-run using the same set of input data used in the original ex-post market run, with corresponding adjustments or corrections as may be appropriate depending on the cause of the pricing error.



- 7.3. To avoid disruptions in the hourly market runs, the Market Operator may perform a market re-run in the offline mode of the Market Management System provided that the infrastructure that will be used must contain the same software release version and Market Network Model version as that used in the original ex-post market run.
- 7.4. In performing the market re-run, the Market Operator shall determine the appropriate solution that shall be applied in the market re-run taking into consideration the criteria and procedures in determining ex-post nodal energy prices set forth in WESM Rules clauses 3.10.6 and 3.10.7 and those set forth in the WESM Manual on Procedures for Determining Ex-Post Nodal Energy Price.

Appendix B presents the applicable solutions for the various causes of non-congestion pricing errors. The Market Operator shall, from time to time, review and update the list and description of the solutions being applied for various causes of pricing errors. The updated Appendix B will be submitted for review and approval by the Rules Change Committee and the PEM Board for amendment to the Manual, prior to implementation. The Market Operator shall publish in the market information website, the updated list and description of the solutions being applied for various causes of pricing errors.

- 7.5. Market re-runs shall be performed and shall be completed within a reasonable time after the relevant market trading interval, provided that all market re-runs shall be completed before the issuance of the final settlement statements for the relevant billing month.

## **8. GUIDELINES FOR APPLICATION OF SUBSTITUTE PRICES**

### **8.1. Non-Congestion Pricing Errors**

8.1.1. Pursuant to WESM Rules clause 3.10.5, where there is pricing error in the ex-ante market runs, the ex-post prices if valid shall serve as ex-ante prices. Where there is pricing error in the ex-post run, the prices as determined in the market re-run (the “market re-run prices” or “MRR prices”) shall be used as substitute prices.

8.1.2. The substitute prices as determined in accordance with the foregoing Section shall be used in the settlement of transactions for the affected trading intervals. Pursuant to WESM Rules clause 3.10.5 (b), the substitute prices shall likewise be applied in cases where the Market Operator was unable, for any reason, to issue a pricing error notice within the timetable set forth in this Manual.

8.1.3. Pursuant to WESM Rules clause 3.10.5 (b), the substitute prices shall stand irrespective of the outcome of any subsequent investigations or resolutions of any dispute.

## **8.2. Congestion Pricing Errors**

For network congestion pricing errors, the methodology for determination of substitute prices and the settlement of transactions in affected market runs shall be as set forth in the PSM Manual approved by the ERC and in other relevant decisions, orders or resolutions of the ERC.

## **8.3. Simultaneous Occurrence of Congestion and Non-Congestion Pricing Errors in a Market Run or in a Trading Interval**

8.3.1. Consistent with the PSM Manual, the guidelines contained in this Section shall apply in cases where there is simultaneous occurrence of congestion and non-congestion pricing errors in either a market run or a trading interval. Where there is inconsistency between this Manual and the PSM Manual or with relevant decisions, orders or resolutions of the ERC, the PSM Manual as approved by the ERC or the relevant ERC decision, order or resolution shall prevail.

8.3.2. If the ex-ante market run indicates the simultaneous occurrence of congestion pricing error and non-congestion pricing error, such that the resulting prices reflect constraint violation coefficients ("CVC") or there are no valid prices, WESM Rules clauses 3.10.5 (a) and (b) shall apply. As such, the ex-post prices, if valid, shall serve as ex-ante prices.

8.3.3. If the ex-post market run indicates the simultaneous occurrence of congestion pricing error and non-congestion pricing error, a market re-run shall be performed in accordance with WESM Rules clause 3.10.5 (a). If the resulting prices ("market re-run prices") indicate extreme nodal price separation as defined in the PSM Manual, then the methodology provided for in the PSM Manual shall apply. Otherwise, the market re-run prices shall be used for settlement pursuant to WESM Rules clauses 3.10.5 (a) and (b).

8.3.4. If the ex-ante market run indicates occurrence of a non-congestion pricing error while the ex-post market run indicates the occurrence of a congestion pricing error, the substitute generator prices and customer prices determined pursuant to the PSM Manual shall also serve as ex-ante prices.

8.3.5. If the ex-post market run indicates occurrence of a non-congestion pricing error, a market re-run shall be performed pursuant to WESM Rules clause 3.10.5 (a). If the market re-run prices indicate occurrence of extreme nodal price separation as defined in this Manual, the price substitution methodology set forth in this Manual shall apply.

## **9. ISSUANCE AND PUBLICATION OF PRICING ERROR NOTICES AND MARKET RE-RUN RESULTS**

- 9.1. Immediately after each trading interval when the pricing error occurs, as defined in this Manual, the *Market Operator* will issue *pricing error notices* to the *Trading Participants*. Where no pricing error notice is issued within the timetable, the *Market Operator* shall issue the pricing error notice prior to the issuance of the preliminary settlement statement for the relevant billing period.
- 9.2. 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 Manual is not met, the *Market Operator* shall issue an advisory to all *Trading Participants* informing them of the correction.
- 9.3. 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.
- 9.4. Within two (2) business days after the trading day when the pricing error occurs, 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 Manual.
- 9.5. After each billing period and upon completion of all market re-runs, the following information shall be published by the Market Operator shall in the market information website and disseminated to all *Trading Participants* –
  - 9.5.1. Complete list of the pricing errors that occurred during the billing month, indicating clearly the affected market run and trading interval, including those instances where no pricing error was issued within the timetable; and
  - 9.5.2. Results of the market re-run, including the resulting market prices.
- 9.6. The publication of all relevant information will be in accordance with the relevant provisions of the WESM Rules and relevant market manuals.

**APPENDIX A - Non-Exhaustive List of Erroneous, Inconsistent and  
Inappropriate Input Data That Can Result to a Pricing Error**

	<b>Description</b>	<b>Remarks</b>
1	Conflicting generator offers and security limits data	may cause generators to be scheduled more than their offered quantity or capability
2	Conflicting outage schedule and security limit nomination	may generator cause scheduling of a generator even on outage
3	Outage schedule is inconsistent with actual outages	Generators included in the outage schedule will not be scheduled even when connected to the grid and has valid offers.
4	Bad and non-updating system snapshot data (breaker status, load levels, etc.)	<p>Bad breaker status may cause isolation of loads and generators or islanding of a group of nodes.</p> <p>The system snapshot 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.</p>
5	Errors resulting from limitations of Market Network modelling	Arise when there is inconsistency between the Market Network Model and the actual power system network

**APPENDIX B – Solutions for Various Cases of Non-Congestion Pricing Errors**

<b>Market Re-Run Case Conditions</b>	<b>Solution/s</b>
<b>1. No Ex-Post Results</b>	
(a) No save case produced	Reproduce the save case in the MMS using the MOST3 machine by running an Ex-Post (RTX) interval with the same set of bids, offers, security limit, outage schedule, system snapshot and transmission limit. Ensure that the MMS in MOST3 terminal has the same Market Network Model and Software Release version before reproducing the save case.
(b) Ex-Post run started but maximum number of iteration was reached	Identify nodes/areas/factors causing the non-convergence for correction.
(c) Non-convergence of load flow solution	Identify nodes/areas/factors causing the non-convergence for correction.
(d) No system snapshot data was received causing error in the workflow run	Reproduce the save case in the MMS using the MOST3 machine by running an Ex-Post (RTX) interval with the same set of bids, offers, security limit, outage schedule, system snapshot and transmission limit. Ensure that the MMS in MOST3 terminal has the same Market Network Model and Software Release version before reproducing the save case.
<b>2. CVC Related Errors</b>	
(a) Under-generation	<p>A. Under-Generation due to bad data.</p> <p>(1) Reconnect isolated generators that are in actual operation for the region (Luzon or Visayas) where under-generation occurs.</p> <p>B. Under-generation due to insufficient offers and/or generator ramping limitation</p> <p>(1) Reflect the actual generation of the generators, with actual generation greater than its maximum operating limit, based on the system snapshot used in the region affected and reflect the actual</p>

Market Re-Run Case Conditions	Solution/s
	<p>ramp rate of ramp limited generators (if applicable) in the region affected.</p> <p>(2) Reflect the actual HVDC flow.</p> <p>(3) Re-compute nodal loads to reflect actual demand.</p>
(b) Over-generation	<p>A. Over-generation with must-run units.</p> <p>(1) Reduce must run generators to its actual generation in accordance with the system snapshot data used in the (original) Ex-Post (RTX) run.</p> <p>B. Over-generation with no must-run units.</p> <p>(1) Reflect the actual ramp rate of ramp limited generators in the region affected.</p> <p>(2) Reflect the actual dispatch of generators in the region affected in accordance with the system snapshot used in the (original) RTX run.</p>
(c) Base Case Violation	<p>A. Base Case Violation due to bad data:</p> <p>(1) Reflect actual equipment status.</p> <p>(2) For bad load data, implement the procedure for re-run with bad-data.</p> <p>B. Congested System:</p> <p>(1) Reflect the actual dispatch in accordance with the system snapshot data used in the (original) RTX run.</p> <p>(2) Verify if there was an automatic load dropping and/or manual load drop performed by the system operation. Reflect the actual load values in accordance with the system snapshot data used in the (original) RTX run.</p> <p>(3) Relax (increase) the limit of the affected equipment. Note that the transmission line and transformer limit data currently being used in the MMS which was</p>

<b>Market Re-Run Case Conditions</b>	<b>Solution/s</b>
	submitted by the System Operator is set at 100% of the actual MVA rating. This is the last approach to be used to come up with valid results.
(d) Manifestation of VoLL price	A. Bad Load Data  (1) Re-compute the nodal load distribution using the corrected snapshot data. (2) Use the corrected nodal loads in the market re-run.
(e) Contingency Violation	A. Localized Congestion: No network congestion in any of the grid  (1) Disable the NSA Contingency Analysis.  B. Localized Congestion: With network congestion  (1) Relax (increase) transmission limit of the equipment affected to reflect the actual loading condition that exceeds the rated single line contingency (N-1) rating
<b>3. HVDC Related Issues<sup>2</sup></b>	
(a) HVDC flow nomination was not met	A. Actual HVDC flow: Visayas to Luzon (1) Increase Operating Limits of Visayas generators to allow Visayas deliver power to Luzon.  B. Actual HVDC flow: Luzon to Visayas (1) Decrease Operating Limits of Visayas generators to allow Luzon deliver power to Visayas.
(b) No HVDC limits were submitted	Implement the HVDC nomination used in the same target date and interval of the Ex-Ante (RTD). However, if the Ex-Ante (RTD) interval also has no HVDC nomination, the HVDC flow in the system snapshot used by the Ex-Post (RTX) is used as the basis for HVDC

<sup>2</sup> This may no longer be applicable when Visayas is integrated into the WESM.

<b>Market Re-Run Case Conditions</b>	<b>Solution/s</b>
	nomination.
(c) HVDC nomination inconsistent with the actual flow direction	Set the nomination equal to the actual HVDC flow as shown in the system snapshot used for the Ex-Post (RTX) interval.
4. Erroneous, inconsistent and inappropriate input data	
(a) Improper use of security limits	Analyze the effect/impact of the inconsistent data to the resulting schedule of generators and reflect the appropriate security limit data in the market re-run.
(b) Conflicting outage schedule and security limit nomination	Reflect actual status of the generator affected
(c) Outage schedule not withdrawn causing generator/line to be in outage	Identify the affected equipment and reflect the actual status of the equipment (as necessary) in the market re-run.
(d) Bad and non-updating system snapshot data	Identify the affected load, generator or equipment and reflect the actual generation/load values or status (as necessary) in the market re-run.
(e) Errors associated with limitations in the Market network Model modeling	Identify the affected load, generator or equipment and reflect the actual generation/load values or status (as necessary) in the market re-run.
(f) Delayed system snapshot data	Reflect the system snapshot data taken on the 59th minute of the hour in the re-run. This requires re-computation of the nodal demand and modification of breaker status (if applicable).