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Wholesale Electricity Spot Market

Proposed Amendments to the WESM Manual on Constraint Violation Coefficients (CVC) and Pricing Re-Runs to Include Additional CVCs to Reflect the Dispatch Hierarchy of Self-Scheduled Generation

Independent Electricity Market Operator of the Philippines

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I. SUMMARY OF THE PROPOSED RULES CHANGE

The amendments to the WESM Manual on Constraint Violation Coefficients (CVC) and Pricing Re-Runs are proposed to include additional CVCs to reflect the dispatch and curtailment hierarchy for non-scheduled, priority dispatch and must dispatch generating unit classifications – collectively called self-scheduled generating units.

II. BACKGROUND

The market dispatch optimization model (MDOM) uses linear programing to determine the optimal dispatch schedules and nodal prices every dispatch interval. The optimization process considers the inputs from the Market Operator, System Operator and Trading Participants to determine the optimal schedules and nodal prices. However, the conditions set by these inputs may not always lead to a feasible solution (e.g., scheduling all generating units will not satisfy demand due to supply scarcity). As such, Constraint Violations Coefficients (CVC) are set for market dispatches to ensure that the MDOM always finds a solution which satisfies all the constraints, if such a solution exists[1]. These CVCs are also set for market pricing re-runs to ensure that the results are approximately the same as the original market dispatches[2].

The CVCs are arranged in a manner such that the dispatches of network elements, loads and generating units are physically feasible even if some constraints are violated, and reflect how the System Operator should manage system security and reliability[3]. This hierarchy of CVCs are provided in the WESM Manual on CVC and Pricing Re-Runs. The market manual sets the order of relaxing soft constraints 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[4]:

a. Tertiary Reserve Requirement Constraint
b. Primary Reserve Requirement Constraint
c. Nodal VoLL or Nodal Energy Balance Constraint
d. System Energy Balance Constraint
e. Self-Scheduled Generation Constraint
f. Thermal Contingency Constraint – Transformer
g. Thermal Contingency Constraint – Line
h. Thermal Contingency Constraint – Branch Group
i. Secondary Reserve Requirement Constraint
j. Thermal Base Case Constraint – Transformer
k. Thermal Base Case Constraint – Line
l. Thermal Base Case Constraint – Branch Group

Currently, there is only one CVC associated with non-scheduled, priority dispatch and must dispatch generating unit classifications of self-scheduled generation (item e). However, these three classifications are prioritized differently in dispatch

[1] WESM Rules Clause 3.6.2.1 (a)
[2] WESM Rules Clause 3.6.2.2 (a)
[3] WESM Rules Clause 3.6.2.1 (b)
[4] WESM Manual on Constraint Violation Coefficients (CVC) and Pricing Re-Runs Issue 6.0

and dispatch curtailment[5] and should be associated in separate CVCs. As provided in Clause 3.6.1.8 of the WESM Rules, the MDOM shall consider the following hierarchy when a combination of the groups is to be restricted:

(a) Market offers of scheduled generating units beyond its minimum
(b) Non-scheduled generating units
(c) Priority dispatch generating units
(d) Must dispatch generating units

III. THE PROPOSED RULES CHANGE

The proposed amendments seek to include additional CVCs to reflect the dispatch and curtailment hierarchy for non-scheduled, priority dispatch and must dispatch generating unit classifications. Since the three classifications are treated differently in the dispatch and dispatch curtailment process, it is proposed that the classifications be associated with separate CVCs. The proposed changes, detailed below, include the delineation of Self-Scheduled Generation Constraints (items e-g) and adjustments on the higher prioritized CVCs (items h-n) resulting from the inclusion of new CVCs.

a. Tertiary Reserve Requirement Constraint
b. Primary Reserve Requirement Constraint
c. Nodal VoLL or Nodal Energy Balance Constraint
d. System Energy Balance Constraint
e. **Self-Scheduled Generation Constraint – Non-Scheduled Generation**
f. **Self-Scheduled Generation Constraint – Priority Dispatch Generation**
g. **Self-Scheduled Generation Constraint – Must Dispatch Generation**
h. Thermal Contingency Constraint – Transformer
i. Thermal Contingency Constraint – Line
j. Thermal Contingency Constraint – Branch Group
k. Secondary Reserve Requirement Constraint
l. Thermal Base Case Constraint – Transformer
m. Thermal Base Case Constraint – Line
n. Thermal Base Case Constraint – Branch Group

IV. BACKGROUND AND DESCRIPTION OF THE PROPONENT

The proponent is the Independent Electricity Market Operator of the Philippines, Inc. IEMOP acts as the market operator of the WESM.

Top Officers:
Engr. Jose Mari T. Bigornia – President and CEO
Arthur P. Pintado – Internal Audit Head
Robinson P. Descanzo – Trading Operations Head
Rachel Angela P. Anosan – Chief Legal Officer
Isidro E. Cacho, Jr. – Chief Corporate Strategy and Communications Officer
Salvador D. Subaran – Chief Information Systems and Technology Officer

V. CONCLUSIONS AND RECOMMENDATIONS

[5] WESM Rules Clause 3.6.1.8

It is proposed to have separate CVCs for non-scheduled, priority dispatch and must dispatch generating unit classifications. By specifying separate CVCs associated with these three categories of self-scheduled generation, the hierarchy for the dispatch and dispatch curtailment process provided in the WESM Rules will be reflected in the WESM Manual and in the market dispatch optimization process.

VI. REFERENCES

1. WESM Rules
2. WESM Manual on Constraint Violation Coefficients (CVC) and Pricing Re-Runs Issue 6.0