



TC Comments to the Proposed Amendments to the WESM Rules and WESM Manual on Dispatch Protocol regarding Maximum Available Capacity

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This document is prepared by the
WESM Technical Committee

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1.0 INTRODUCTION

This document provides general comments to the Philippine Electricity Market Corporation's (PEMC) *Proposed Amendments to the WESM Rules and WESM Manual on Dispatch Protocol regarding Maximum Available Capacity* (ORCP-WR-WM-22-08) as prepared by the Market Surveillance Committee (MSC) and Compliance Committee (CC). These comments are in addition to the TC matrix of comments as prescribed by the Rules Change Committee.

The Technical Committee prepared this document to clarify its position on the matter which would not have been reflected in the RCC-prescribed form.

Reason for the Proposed Amendment

Based on the understanding of the TC, the issue is regarding loopholes in the Must-Offer Rule (MOR) wherein Trading Participants offer in the WESM without clear intention of generating energy for the grid by (a) opening the breaker so that no schedule will be given or (b) submit very low ramp rates as would render it impossible for the generating units or plants to attain the offered capacity (i.e., self-imposed scheduling constraint). These allow the participants to circumvent the dispatch scheduling process without breaching the MOR (i.e., withholding of capacity).

The TC suggests citing the undesirable impacts in the market to demonstrate the gravity of such actions. Examples of undesirable impacts would be frequent pricing errors, extreme price volatility, or sub-optimal dispatch. Price volatility and pricing errors can be observed and measured readily unlike actions relating to circumvention of MOR which requires more detailed investigations. Measurement allows quantitative comparison of market outcomes with introduction of revised rules and procedures.

Purpose of the Proposed Amendment

As stated in the proposal, the amendment aims to provide clarity and guidance to Trading Participants in the submission and revision of generation offers in the market. The TC suggests adding the reduction of undesirable market outcomes (e.g., frequent pricing errors, extreme price volatility, or sub-optimal dispatch) to the purpose of the proposed amendment.

2.0 DEFINITION OF TERMS

The TC believes that the terms used in the dispatch protocol should have the same meaning and context with that of the Philippine Grid Code (PGC) since this is the primary reference of the System Operator (SO), and the document is a protocol between the Market Operator (MO) and SO in providing services to the Trading Participants.

Table 1 compares some of the terms related to the dispatch protocol and the proposed amendment and the PGC. The last column of the table provides the comments and suggestions of the TC on how the definitions may improve the proposed amendment.

Table 1. Terms Related to the Proposed Amendment

Proposed Amendment	Philippine Grid Code	TC Comments
<p>Maximum Available Capacity - Equal to the registered maximum capacity (Pmax) of the (aggregate) unit less forced unit <i>outages</i>, scheduled unit <i>outages</i>, de-rated capacity <i>technical constraints</i> and weather disturbance that cause damage to the unit or that would otherwise limit its ability to inject power to the <i>grid</i>.</p>	<p>Maximum Available Capacity - The sum of the Available Capacity/ies of the Generating Units of the Generating Plant.</p> <p>Available Capacity - The Dependable Capacity, modified for Equipment limitation at any time.</p> <p>Dependable Capacity - The Maximum Capacity, modified for ambient limitations for a specified period of time, such as month or a season.</p>	<p>The definition of the Maximum Available Capacity in the PGC is recommended.</p> <p>Available Capacity should be defined as the <u>gross</u> MW output that a generating unit can sustain for a specified time. (Assumed: gross)</p> <p>The reasons for limitations or constraints need not be mentioned.</p> <p>Dependable Capacity need not be mentioned in the amendment.</p>
<p>Pmax - The maximum demand in MW that a generating, or a generating block or module in case of a combined cycle power plant, can reliably sustain for an indefinite period of time, based on time generator provided in the latest Certificate of Compliance (COC).</p>	<p>Maximum Capacity - The Maximum Capacity that a unit can sustain over a specified period of time. The Maximum Capacity can be expressed as Gross Maximum Capacity or Net Maximum Capacity. To establish this capacity, formal demonstration is required. The test should be repeated periodically. This demonstrated capacity level shall be corrected to generating conditions for which there should be minimum ambient restriction. When a demonstration test has not been conducted, the estimated Maximum Capacity of the unit shall be used.</p> <p>Gross Maximum Capacity - The Maximum Capacity a unit can sustain over a specified period of time when not restricted by seasonal or other deratings.</p> <p>Net Maximum Capacity – The Gross Maximum Capacity less the unit capacity utilized for that unit's station service or auxiliaries.</p>	<p>Registered Capacity should be defined as the tested/certified MW capacity on the COC of the Generator, or the most recent capacity test result authorized by the ERC.</p> <p>Maximum Capacity should be defined as the maximum <u>gross</u> MW output of generating unit or plant according to the Registered Capacity. (Assumed: gross)</p> <p>Pmax should be defined as the Maximum Capacity of generating unit or plant less demand for station service and auxiliaries. Note: Pmax is reckoned at the Market Trading Node for purposes of offer submission.</p> <p>May also consider using PGC definition on “Maximum Load Pmax” – The maximum net output in MW that a Generating Unit can reliably sustain based on the Generating Unit capability tests.</p> <p>Gross Maximum Capacity and Net Maximum Capacity need not be mentioned in the amendment.</p>

Proposed Amendment	Philippine Grid Code	TC Comments
<p>Technical Constraint - Refers to plant equipment related failure/constraints, limitations encountered during <i>start-up/shutdown procedure, effects of ambient temperature and resource-related constraints due to the following:</i></p> <p>(a) <i>water elevation and diversion requirements for domestic or irrigation use for hydro plants;</i></p> <p>(b) <i>steam quality (chemical composition, condensable and non-condensable gases, steam pressure and temperature) for geothermal plants;</i></p> <p>(c) <i>unavailability of fuel resources that are not within the control of the Generation Company for biomass power plants; and</i></p> <p>(d) <i>steam flow limitations, station load, and electricity demand of its energy host, in the case of the co-generation systems.</i></p>	Not defined	<p>Technical Constraint is a very broad phrase that can apply to the generation, transmission, and distribution sectors.</p> <p>TC suggest omitting this term being exclusively defined for generation. Or, consider using the term “Generator Technical Constraint.”</p>
Not defined	<p>Capability and Availability Declarations - Refers to the data submitted by the Generation Company for its Scheduled Generating Unit, which is used by the Market Operator in preparing the day-ahead Dispatch Schedule. It includes declaration of capability and Availability, Generation Scheduling and Dispatch Parameters, and Price Data.</p>	<p>The PGC definition implies that the data submissions of Generators require declaration of availability and capability for day-ahead dispatch scheduling.</p> <p>This was not defined nor required in the proposed amendment.</p> <p>The TC suggest using this requirement in the proposed amendment and make the declarations binding up to the real-time dispatch.</p>
<p>Availability - The state of readiness of a <i>generating unit or facility</i> for actual use, operation, or service for a particular time, period, or <i>dispatch interval</i>.</p>	<p>Availability - The long-term average fraction of time that a Component or system is in service and satisfactorily performing its intended function. Also, the steady-state probability that a Component or system is in service.</p>	TC suggests not to use this term since their definitions are very different.

3.0 CONCLUSION OF THE PROPOSED AMENDMENT

It was concluded in the proposed amendment that, if adopted, “will improve the compliance of the Trading Participants with MOR by being more responsible in offering/bidding and revising/updating of offers”. However, the TC does not share these views for the following reasons:

- Trading Participants who are circumventing the MOR have demonstrated advanced knowledge and skills in the submission/revision of offers. Providing clarifications and guidelines will do very little to improve compliance because there is no breach or non-compliance in the first place.
- The loopholes that are being exploited by Trading Participants is systemic or inherent in the market design and hence should be deterred accordingly. Defining “Maximum Available Capacity” is a good start but the proposed amendment fell short of the consistent contextual use of this term vis-à-vis “Registered Capacity”.

To help clarify this opposing view, the TC provided additional discussions on certain aspects of the WESM design which are relevant to the Must-offer Rule, Maximum Available Capacity, Offer Ramp Rates, and Circuit Breaker Status in the following sections.

4.0 ADDITIONAL RELEVANT DISCUSSION

Gross Pool and Net Settlement Designs

MOR represents the “gross pool” design of the WESM whereby Generator Trading Participants offer their Maximum Available Capacity for central scheduling and dispatch. Net settlement, on the other hand, is a market design whereby bilateral contract quantities (BCQs) are settled outside the WESM by declaration of two contracting parties after the actual dispatch.

When Trading Participants offer their Maximum Available Capacities into the “gross pool” market, it includes both contracted and uncontracted capacities. There is no disclosure in the market as to how these capacities are allocated during scheduling and dispatch since BCQs are declared only afterwards based on “net settlement” market design. As a result, contracted quantities can influence spot prices but BCQs are not affected by these prices during settlement.

The lack of information on the contractual commitments of Trading Participants in a “gross pool” design creates a larger demand and supply uncertainties in the market when compared to a “net pool” design where bilateral commitments are scheduled ahead of the uncontracted capacities. In this design, only uncontracted capacities are offered in the spot market and bilateral contracts are managed more transparently.

The TC believes that the combination of “net pool” and “net settlement” designs can provide more accountability for Trading Participants with bilateral contract and reduces the opportunity for withholding capacities (i.e., exploiting MOR loopholes).

Self-Commitment Design

In power systems operations, the term “unit commitment” is the determination which power plants or generating units are to be in operation for a specific scheduling and dispatch period. The determination considers all generating units to be started up, shutdown, or operated continuously over the dispatch period

to meet the forecasted demand at the least possible cost. This facilitates real-time economic load dispatch among generating units or plants that are already operating in the grid.

Unlike the traditional unit commitment process in system operations, the “self-commitment” market design gives the participants the responsibility for the unit-commitment decisions of their generating units and the associated market risks through submission of offers.

Given the responsibilities and associated risks, it would be understandable for these participants to manage their financial exposures within the bounds of rules and procedures. Exploiting the MOR loopholes would be their option if management of their bilateral contracts does not work.

It should also be pointed out that circuit breaker status used by the Market Dispatch Optimization Model (MDOM) and/or the Market Management System (MMS) to determine whether the generating unit or plant is online or offline is part of the unit dispatch scheduling process of MO. However, the switching of these breakers is part of the unit commitment process which is the responsibility of the Trading Participant in a self-commitment market design. It can be argued that the MDOM/MMS in a self-commitment market should not consider the breaker status when clearing capacity offers but this may run counter to the security-constrained economic dispatch principle which is also inherent in the WESM design.

This gray area in self-commitment design creates the loophole for withholding capacity which poses supply risk that could result in erratic or volatile spot prices and sub-optimal dispatch. This, in the opinion of the TC, is the systemic problem inherent in the self-commitment design.

Ramp Rate Data Submission

The inclusion of ramp up/down rates in the Generation Offer provides an opportunity for Trading Participants to manipulate the outcome of their dispatch schedules. By submitting ramp rate data with very low value, the resulting dispatch schedules of their generating units or plant will be almost constant regardless of their offered capacities.

The TC believes that ramp rates are registered data and like registered capacity, these data should be certified and tested as part of the COC requirements. TC suggests the inclusion of Capability and Availability Declarations in the dispatch protocol process for purposes of submitting Maximum Available Capacities and ramp rate capabilities. Ramp rate data should be removed from the Generation Offer data submission to prevent exploitation of the MOR loophole.

5.0 SUMMARY AND CONCLUSION

The aim of the proposed amendment to provide clarity and guidance to Trading Participant in the submission and revision of Generation Offers in the WESM will be ideal in understanding the dispatch protocol.

However, the view of the TC is that there are bigger issues that need to be addressed in the WESM design to avoid the exploitation of loopholes and encourage greater responsibility and accountability of trading participants. The TC recommends a market design study on net pool and net settlement with advanced (day-ahead) scheduling of capacities with bilateral contracts.

Understanding of the dispatch protocol requires consistency in the contextual use of terms even if their definitions are different with respect to PGC. Bear in mind that the primary reference of SO when it comes to

dispatch is the PGC and the protocol is a means of communication and coordination between MO and SO. Behaviors or actions of trading participants in the context of this proposed amendment would be difficult to observe or measure. This is more challenging if non-compliance or breach cannot be established. The TC suggests monitoring of undesirable market results or event which can be readily observed, measured, and correlated with participant actions or behaviors (e.g., pricing errors or spot price volatility). This approach can help justify the necessity of the proposed amendment and later quantify improvements in market performance with its implementation.

The comments provided in this document are opinions and suggestions of the TC members only and should be subjected to more detailed validation studies.

6.0 REFERENCES

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