Wholesale Electricity Market
Rule Change Proposal Form

Change Proposal No: RC_2009_42

Received date:

Change requested by

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Date submitted:	17/12/09
Urgency:	High
Change Proposal title:	Calculation of Net STEM Shortfall
Market Rule(s) affected:	4.26.2, 4.26.2B, 4.26.5

Introduction

Clause 2.5.1 of the Wholesale Electricity Market Rules (Market Rules) provides that any person (including the Independent Market Operator (IMO)) may make a Rule Change Proposal by completing a Rule Change Proposal Form that must be submitted to the IMO.

This Change Proposal can be posted, faxed or emailed to:

Independent Market Operator
Attn: Troy Forward, Manager Market Development and System Capacity
PO Box 7096
Cloisters Square, Perth, WA 6850

Fax: (08) 9254 4399
Email: market.development@imowa.com.au

The IMO will assess the proposal and, within 5 Business Days of receiving this Rule Change Proposal form, will notify you whether the Rule Change Proposal will be progressed further.

In order for the proposal to be progressed, all fields below must be completed and the rule change proposal must explain how it will enable the Market Rules to better contribute to the achievement of the wholesale electricity market objectives. The objectives of the market are:

(a) to promote the economically efficient, safe and reliable production and supply of electricity and electricity related services in the South West interconnected system;
(b) to encourage competition among generators and retailers in the South West interconnected system, including by facilitating efficient entry of new competitors;
(c) to avoid discrimination in that market against particular energy options and technologies, including sustainable energy options and technologies such as those that make use of renewable resources or that reduce overall greenhouse gas emissions;
(d) to minimise the long-term cost of electricity supplied to customers from the South West interconnected system; and
(e) to encourage the taking of measures to manage the amount of electricity used and when it is used.

Details of the proposed Market Rule Change

1. Describe the concern with the existing Market Rules that is to be addressed by the proposed Market Rule change:

Background

A Net STEM Shortfall is the amount by which the Reserve Capacity actually supplied by a Market Participant falls short of that Participant's Reserve Capacity Obligation. It is used to calculate the Capacity Cost Refund payable by a Participant.

The formula for the Net STEM Shortfall (clause 4.26.2) has a pre-STEM component, which is the amount by which the capacity offered by a Participant in bilateral trades and the STEM falls short of the Participant's Reserve Capacity Obligation, and a post-STEM (real-time) component, which is the amount by which the energy actually supplied by the Participant falls short of its Resource Plan or Dispatch Instruction quantity.

If a Facility suffers a Forced Outage, the Participant will incur a Facility Forced Outage Refund in accordance with clause 4.26.1A. In order to avoid penalising a Participant twice for the same Forced Outage, the real-time component of the Net STEM Shortfall formula reduces the amount of energy the Participant is required to supply by the amount of the outage.

Issue

The Net STEM Shortfall formula specifies that Reserve Capacity Obligation Quantities (RCOQs), real-time Forced Outage quantities (RTFOs), Dispatch Schedule quantities (DSQs), and Metered Schedule quantities (MSQs) are to be summed over all of a Participant's Facilities before being used in the calculation. The effect of this approach is that, if a participant has one Facility that is undergoing a Forced Outage, and another Facility that has unused capacity (RCOQ > DSQ), then its Net STEM Shortfall will be inflated by the amount of that unused capacity.

For example, suppose that a Participant has two Facilities as follows:

	Facility 1	Facility 2	Total
RCOQ	100	20	120
RTFO	40	0	40
DSQ	100	0	100
MSQ	60	0	60
Real-time Shortfall	0	0	20

Facility 1 has suffered a partial Forced Outage; although it was expected to deliver 100MW, it is able to deliver only 60MW. Facility 2 has not been dispatched. The pre-STEM component of the Net STEM Shortfall is zero, as the Participant's Resource Plan did offer the required capacity to the market. The real-time component is calculated as the amount by which MSQ falls short of the lesser of DSQ and (RCOQ – RTFO). We find that the Shortfall calculated using the total quantities is non-zero, even though the Shortfall would be zero if calculated for each Facility separately.

In effect, the formula implicitly requires a Participant to use any available capacity in its other Facilities to compensate for a loss of capacity caused by a Forced Outage. This is the correct method to apply prior to the STEM, as a Participant can choose which of its Facilities it will use to meet its Reserve Capacity Obligations. However, once it has submitted its Resource Plan, a Participant cannot unilaterally decide to depart from it in response to a real-time Forced Outage – System Management decides how to respond. Thus a Participant can be penalised for failing to do something that it is not permitted to do.

Additionally, if a Participant has a Facility whose MSQ is greater than its RCOQ (as will be the case for Intermittent Generators, whose RCOQ is zero), then the surplus subtracts from any Net STEM Shortfall resulting from another Facility failing to meet its DSQ. This gives an unwarranted advantage to a Participant that has both intermittent generation facilities and scheduled generation facilities in its portfolio.

Proposal

Griffin proposes that the real-time component of the Net STEM Shortfall be calculated separately for each Facility, and then aggregated over a Participant's Facilities.

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2. Explain the reason for the degree of urgency:

Griffin believes the out workings of the current version of Net STEM Shortfall formula is not consistent with the intent of the Rules. This represents a manifest error and has a real and direct impact on settlements. As such, Griffin believes the rule change proposal should be processed using the fast track Rule Change Process, as set out in 2.5.9 below. Griffin believes this is consistent with the application of the fast track process for RC_2007_05 (Reserve Capacity Refund Shortfall Formula), which dealt with a similar issue.

2.5.9. The IMO may subject a Rule Change Proposal to the Fast Track Rule Change Process if, in its opinion, the Rule Change Proposal:

(a) is of a minor or procedural nature; or

(b) is required to correct a manifest error; or

(c) is urgently required and is essential for the safe, effective and reliable operation of the market or the SWIS.

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3. Provide any proposed specific changes to particular Rules: (for clarity, please use the current wording of the Rules and place a ~~strikethrough~~ where words are deleted and underline words added)

4.26.2. The IMO must determine the net STEM shortfall ("**Net STEM Shortfall**") in Reserve Capacity supplied by each Market Participant p holding Capacity Credits associated with a generation system in each Trading Interval t of Trading Day d and Trading Month m as:

$$SF(p,m,d,t) = \text{Max}(\underline{\text{Sum}(f \in F(p),}\ \text{RTFO}(\underline{f},p,d,t)), \underline{\text{Sum}(f \in F(p),}\ \text{RCOQ}(\underline{f},p,d,t)) - A(p,d,t)) + \underline{\text{Sum}(f \in F(p),}\ \text{Max}(0, B(\underline{f},p,d,t) - C(\underline{f},p,d,t))) - \underline{\text{Sum}(f \in F(p),}\ \text{RTFO}(\underline{f},p,d,t))$$

Where

$$A(p,d,t) = \text{Min}(\underline{\text{Sum}(f \in F(p),}\ \text{RCOQ}(\underline{f},p,d,t)), \text{CAPA}(p,d,t));$$

$$B(\underline{f},p,d,t) = \text{Min}(\text{RCOQ}(\underline{f},p,d,t) - \text{RTFO}(\underline{f},p,d,t), \text{DSQ}(\underline{f},p,d,t));$$

$$C(\underline{f},p,d,t) = \text{Min}(\text{DSQ}(\underline{f},p,d,t), \text{MSQ}(\underline{f},p,d,t));$$

F(p) is the set of Market Participant p's Facilities that have Reserve Capacity Obligations, and f denotes a member of that set;

RCOQ(f,p,d,t) is for Facility f belonging to Market Participant p:

(a) the ~~total~~ Reserve Capacity Obligation Quantity of ~~Market Participant p's~~ the Facility if it is unregistered; or ~~facilities that have Reserve Capacity Obligations,~~

(b) ~~plus the sum over all of the Registered Facilities registered to Market Participant p, of~~ the product of the factor described in clause 4.26.2B as it applies to the Registered Facility and the Facility's Reserve Capacity Obligation Quantity in Trading Interval t of Trading Day d;

CAPA(p,d,t) is for Market Participant p and Trading Interval t of Trading Day d:

(a) equal to Sum(f∈F(p), RCOQ(f,p,d,t)) for a Trading Interval where the STEM auction has been suspended by the IMO in accordance with clause 6.10;

(b) subject to paragraph (a), for the case where Market Participant p is not the Electricity Generation Corporation, the sum of:

i. the sum of the Reserve Capacity Obligation Quantities in Trading Interval t of that Market Participant's Interruptible Loads and Curtailable Loads; plus

ii. the MW quantity calculated by doubling the net MWh quantity of energy sent out by Facilities registered by that Market Participant during that Trading Interval calculated as the Net Contract Position less the shortfall as indicated by the applicable Resource Plan; plus

iiA if a STEM submission does not exist for that Trading Interval, the MW quantity calculated by doubling the total MWh quantity of energy to be consumed by that Market Participant including demand associated with any Curtailable Load or Interruptable Load, but excluding demand associated with any Dispatchable Load during that Trading Interval as indicated by the applicable Resource Plan; plus

iii. the MW quantity calculated by doubling the total MWh quantity covered by the STEM Offers which were not scheduled and the STEM Bids which were scheduled in the relevant STEM Auction, determined by the IMO for that Market Participant under clause 6.9 for Trading Interval t, corrected for Loss Factor adjustments so as to be a sent out quantity in accordance with clause 4.26.2A; plus

iv. double the total MWh quantity to be provided as Ancillary Services as specified by the IMO in accordance with clause 6.3A.2(e)(i) for that Market Participant corrected for Loss Factor adjustments so as to be a sent out quantity in accordance with clause 4.26.2A; plus

v. the greater of zero and (BSFO(p,d,t) – Sum(f∈F(p), RTFO(f,p,d,t)); and

(c) subject to paragraph (a), for the case where Market Participant p is the Electricity Generation Corporation, the sum of:

i the sum of the Reserve Capacity Obligation Quantities in Trading Interval t of that Market Participant's Interruptible Loads and Curtailable Loads; plus

ii the MW quantity calculated by doubling the total MWh quantity of the Net Contract Position quantity of that Market Participant for Trading Interval t, corrected for Loss Factor adjustments so as to be a sent out quantity in accordance with clause 4.26.2A; plus

iii the MW quantity calculated by doubling the total MWh quantity of the STEM Offers which were not scheduled and the STEM Bids which were scheduled in the relevant STEM Auction, determined by the IMO for that Market Participant under clause 6.9 for Trading Interval t, corrected for Loss Factor adjustments so as to be a sent out quantity in accordance with clause 4.26.2A; plus

iv. double the total MWh quantity to be provided as Ancillary Services as specified by the IMO in accordance with clause 6.3A.2(e)(i) for the Electricity Generation Corporation corrected for Loss Factor adjustments so as to be a sent out quantity in accordance with clause 4.26.2A; plus

v. the greater of zero and (BSFO(p,d,t) – Sum(f∈F(p), RTFO(f,p,d,t)).

BSFO(p,d,t) is the total MW quantity of Forced Outage associated with Market Participant p before the STEM Auction for Trading Interval t of Trading Day d, where this is the sum over all the Market Participant's Registered Facilities of the lesser of the Reserve Capacity Obligation Quantity of the Facility for Trading Interval t and the MW Forced Outage of the Facility for Trading Interval t as provided to the IMO by System Management in accordance with clause 7.3;

RTFO(f,p,d,t) is the ~~total~~ MW quantity of Forced Outage associated with Facility f registered by Market Participant p in real-time for Trading Interval t of Trading Day d, where this is ~~the sum over all the Market Participant's Registered Facilities of~~ the lesser of the Reserve Capacity Obligation Quantity of the Facility for Trading Interval t and the MW Forced Outage of the Facility for Trading Interval t as provided to the IMO by System Management in accordance with clause 7.13.1A (b);

DSQ(f,p,d,t) is a MW quantity calculated by doubling the MWh value of the ~~sum over all of the Facilities~~ Dispatch Schedule of Facility f registered by Market Participant p ~~of each Facility's Dispatch Schedule~~ for Trading Interval t of Trading Day d;

MSQ(f,p,d,t) is a MW quantity calculated by doubling the MWh value of the ~~sum over all of the Facilities~~ greater of zero and the Metered Schedule of Facility f registered by Market Participant p ~~of the greater of zero and each Facility's Metered Schedule~~ for Trading Interval t of Trading Day d corrected

for Loss Factor adjustments applicable to that Facility so as to be a sent out quantity.

4.26.2B. The IMO is to set the factor described in the definition of RCOQ(f,p,d,t) in clause 4.26.2 to equal one in all situations except for Scheduled Generators, Non-Scheduled Generators and Dispatchable Loads with Loss Factors less than one, in which event the factor must equal the facili~~t~~ey's Loss Factor.

4.26.5. To support the calculation of the value of RCOQ(f,p,d,t) required by clause 4.26.2:

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4. Describe how the proposed Market Rule change would allow the Market Rules to better address the Wholesale Market Objectives:

Griffin contends this rule change is logical in that it better meets the intention of the Capacity Refund Mechanism, which forms part of the pricing signals incentivising capacity availability. This will advance objective (a) of the Market Rules in that a price signal that is compromised (in this case by an incorrect equation) may lead to inefficient outcomes, or at least to outcomes other than those intended by the introduction of the signal in the first place.

Griffin contends that the rule change is consistent with objectives (b), (c), (d) and (e) in that it does not negatively impact these objectives.

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5. Provide any identifiable costs and benefits of the change:

Costs:

- This Rule Change will require significant changes to the IMO's settlement systems.

Benefits:

- The Rule Change is necessary to allocate settlement revenues and costs as per the intent of the Market Rules.