The background of the lower half of the page is a photograph of a wind farm and power lines, overlaid with a semi-transparent blue filter. On the left, several white wind turbines are visible, with their blades extending outwards. On the right, a tall, lattice-structured power transmission tower stands prominently. The overall scene is set against a clear sky and a hilly landscape.

Independent Market Operator

Rule Change Notice
Title: Calculation of Net STEM Shortfall

Ref: RC_2009_42

Date: 24 December 2009

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1. THE RULE CHANGE PROPOSAL

1.1. The Submission

On 17 December 2009, Griffin Energy submitted a Rule Change Proposal regarding amendments to Clauses 4.26.2, 4.26.2B and 4.26.5 of the Wholesale Electricity Market Rules (Market Rules).

This Rule Change Notice is published according to Market Rule 2.5.7, which requires the Independent Market Operator (IMO) to publish a notice within seven Business Days of receiving a Rule Change Proposal.

1.1.1 Submission details

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Date submitted:	17 December 2009
Urgency:	High
Change Proposal title:	Calculation of Net STEM Shortfall
Market Rules affected:	Clauses 4.26.2, 4.26.2B and 4.26.5

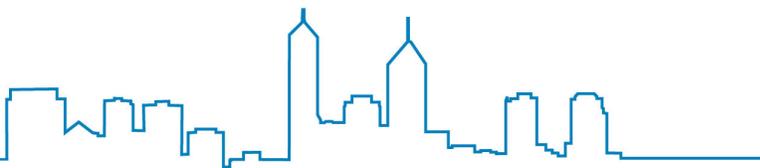
1.2. Details of the Proposal

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

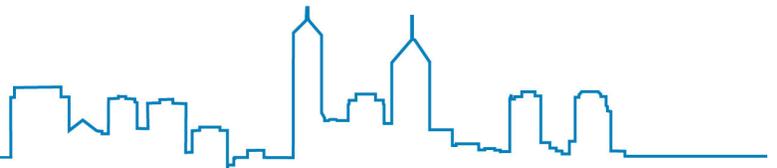
Facility 1 has suffered a partial Forced Outage; although it was expected to deliver 100MW, it is able to deliver only 60MW. Facility 2 has not been dispatched. The pre-STEM component of the Net STEM Shortfall is zero, as the participant's Resource Plan did offer the required capacity to the market. 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 Generators and Scheduled Generators in its portfolio.

Proposal

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



1.3. The Proposal and the Wholesale Market Objectives

Griffin Energy contends that the Market Rules as amended by this Rule Change Proposal would better meet the intention of the Reserve Capacity refund mechanism, which forms part of the pricing signals that incentivise capacity availability. Griffin Energy considers that this Rule Change Proposal will advance Wholesale Market Objective (a) 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.

Griffin Energy contends that the Rule Change Proposal does not adversely affect the other Wholesale Market Objectives.

2. PROPOSED AMENDING RULES

Griffin Energy proposes the following amendments to the Market Rules (~~deleted text~~, added text):

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:

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

Where

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

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

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

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

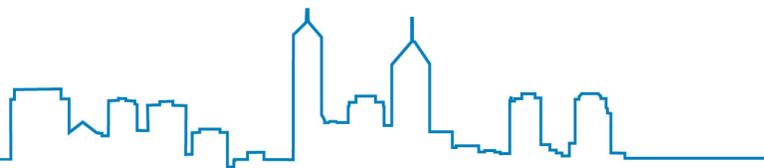
$\text{RCOQ}(f,p,d,t)$ is for Facility f belonging to Market Participant p :

(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,

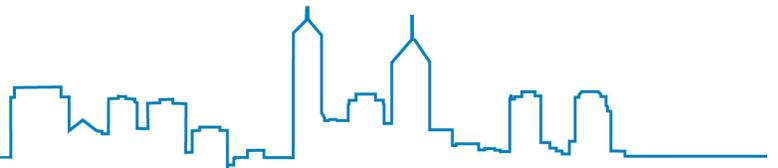
(b) plus the sum over all of the Registered Facilities registered to Market Participant p , of the product of the factor described in clause 4.26.2B as it applies to the Registered Facility and the Facility's Reserve Capacity Obligation Quantity in Trading Interval t of Trading Day d ;

$\text{CAPA}(p,d,t)$ is for Market Participant p and Trading Interval t of Trading Day d :

(a) equal to $\text{Sum}(f \in F(p), \text{RCOQ}(f,p,d,t))$ 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 Interruptible 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 $(BSFO(p,d,t) - \text{Sum}(f \in F(p), RTFO(f,p,d,t)))$; 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 $(BSFO(p,d,t) - \text{Sum}(f \in F(p), RTFO(f,p,d,t)))$.

$BSFO(p,d,t)$ 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);

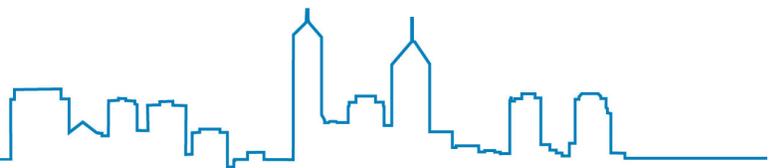
$DSQ(f,p,d,t)$ is a MW quantity calculated by doubling the MWh value of the ~~sum over all of the Facilities~~ Dispatch Schedule of Facility f registered by Market Participant p of ~~each Facility's Dispatch Schedule~~ for Trading Interval t of Trading Day d ;

$MSQ(f,p,d,t)$ 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 facility'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:

...



3. WHETHER THE PROPOSAL WILL BE PROGRESSED FURTHER

The IMO has decided not to proceed with this Rule Change Proposal.

The reason for this decision is that Griffin Energy based its proposal on advice received from the IMO. This advice was provided in the absence of any assessment by the IMO's settlement service provider of the practicality of implementing the proposed Amending Rules.

The IMO considers that it would not be prudent to proceed with a fast track Rule Change Proposal without knowing whether it can be implemented in an appropriate timeframe to resolve the error identified by the proposal.

The IMO has discussed this decision with Griffin Energy who has agreed to submit a new Rule Change Proposal once the IMO has received advice from its settlement service provider.

4. ABOUT RULE CHANGE PROPOSALS

Market Rule 2.5.1 of the Market Rules provides that any person (including the IMO) may make a Rule Change Proposal by completing a Rule Change Proposal Form and submit this to the IMO.

The IMO will assess the proposal and, within 5 Business Days of receiving the proposal form, will notify the proponent whether the proposal will be progressed further.

In order for the proposal to be progressed the change proposal must explain how it will enable the Market Rules to better contribute to the achievement of the Wholesale Market Objectives. The market objectives 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.

A Rule Change Proposal can be processed using a Standard Rule Change Process or a Fast Track Rule Change Process. The standard process involves a combined 10 weeks public submission period, while the fast track process involves the IMO consulting with Rule Participants who either advise the IMO that they wish to be consulted or are considered by the IMO to have an interest in the change.