

Rule Change Notice: Full Runway Allocation of Spinning Reserve Costs (RC_2018_06)

This notice is given under clause 2.5.7 of the Wholesale Electricity Market Rules (**Market Rules**).

Submitter: Zaeen Khan – Public Utilities Office (**PUO**), Department of Treasury

Date submitted: 26 November 2018

The Rule Change Proposal

The PUO is seeking to replace the current modified runway approach used for allocating costs of Spinning Reserve under the Wholesale Electricity Market Rules (**Market Rules**) with a full runway approach.

Under the current modified runway approach, the cost of providing the Spinning Reserve Service is recovered from all generators with output of at least 10 MW synchronised to the system in a given Trading Interval. The costs for the Spinning Reserve Service are allocated based on a system of predetermined blocks (see Table 1), with increasing costs for each block. Generators with output of less than 10 MW do not contribute towards Spinning Reserve costs.

Table 1: Blocks for the allocation of costs for Spinning Reserve Service under the current Market Rules

Block Number	Block Range (MW)	Block Size (MW)
1	> 200	100
2	>125 and ≤ 200	75
3	>65 and ≤ 125	60
4	>45 and ≤ 65	20
5	>10 and ≤ 45	35

Under the proposed full runway approach, the Spinning Reserve costs will be allocated to each generator in a more granular way, where the blocks are de facto infinitesimally small. The approach aims to allocate the Spinning Reserve costs according to the causer pays principle without distorting bidding behaviour in the Balancing Market.

The Rule Change Panel notes that the proposed amendments do not affect Protected Provisions.

Appendix 1 contains the Rule Change Proposal and gives complete information about:

- the proposed amendments to the Market Rules;
- the relevant references to the Market Rules and the proposed specific amendments to those clauses; and
- the submitter's description of how the proposed amendments would allow the Market Rules to better address the Wholesale Market Objectives.

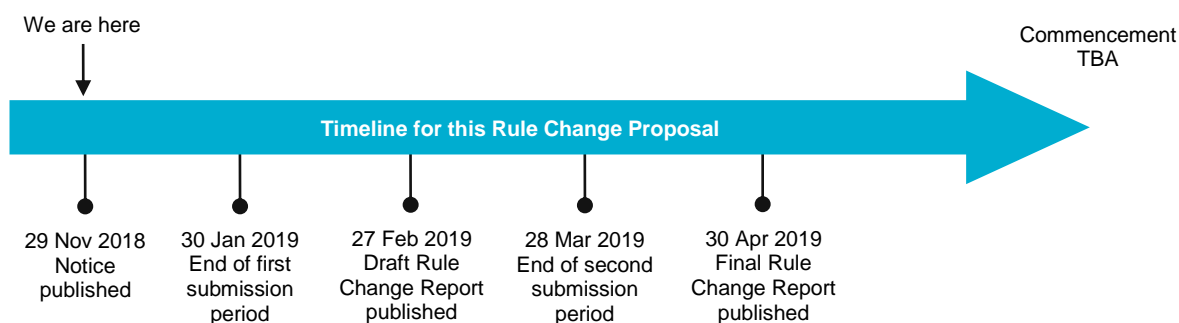
Decision to progress the Rule Change Proposal

The Rule Change Panel has decided to progress this Rule Change Proposal on the basis of its preliminary assessment that the proposal is consistent with the Wholesale Market Objectives.

Timeline

This Rule Change Proposal will be progressed using the Standard Rule Change Process, described in section 2.7 of the Market Rules.

The projected timeline for progressing this proposal is:



The Rule Change Panel has extended the first submission period beyond the usual 30 Business Days to account for the Christmas period.

Call for Submissions

The Rule Change Panel invites interested stakeholders to make submissions on this Rule Change Proposal. The submission period is 40 Business Days from the Rule Change Notice publication date. Submissions must be delivered to the RCP Secretariat by **5:00 PM on Tuesday, 30 January 2018**.

The Rule Change Panel prefers to receive submissions by email, using the submission form available at: <https://www.erawa.com.au/rule-change-panel/make-a-rule-change-submission> sent to support@rcpwa.com.au.

Submissions may also be sent to the Rule Change Panel by post, addressed to:

Rule Change Panel
Attn: Executive Officer
C/o Economic Regulation Authority
PO Box 8469
PERTH BC WA 6849

Wholesale Electricity Market Rule Change Proposal

Rule Change Proposal ID: RC_2018_06
Date received: 26 November 2018

Change requested by:

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Organisation:	Public Utilities Office, Department of Treasury
Address:	David Malcolm Justice Centre, 28 Barrack Street, Perth WA 6000
Date submitted:	26 November 2018
Urgency:	High
Rule Change Proposal title:	Full Runway Allocation of Spinning Reserve Costs
Market Rule(s) affected:	Appendix 2

Introduction

Clause 2.5.1 of the Wholesale Electricity Market (WEM) Rules (Market Rules) provides that any person may make a Rule Change Proposal by completing a Rule Change Proposal form that must be submitted to the Rule Change Panel.

This Rule Change Proposal can be sent by:

Email to: rcp.secretariat@rcpwa.com.au

Post to: Rule Change Panel
 Attn: Executive Officer
 C/o Economic Regulation Authority
 PO Box 8469
 PERTH BC WA 6849

The Rule Change Panel 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 further progressed.

In order for the proposal to be progressed, all fields below must be completed and the change proposal must explain how it will enable the Market Rules to better contribute to the achievement of the Wholesale 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 Rule Change

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

The Australian Energy Market Operator (AEMO) dispatches a number of Ancillary Services to support the safe and reliable operation of the Wholesale Electricity Market (WEM) in Western Australia. Spinning Reserve is one of these Ancillary Services and is provided by generators (synchronised to the system) held in reserve to help arrest any frequency drop due to sudden loss of generation on the system.

In general, AEMO maintains sufficient spinning reserve at any time to cover the greater of 70% of the output of the largest generator synchronised to the system and the maximum load ramp expected in the next 15 minutes. During the period 1 May 2017 to 30 April 2018 the average spinning reserve amount enabled was 290 MW during Peak Trading Intervals and 257 MW during Off-Peak Trading Intervals¹. The corresponding annual cost for this ancillary service was reported by AEMO as \$22.2 million for the period 1 April 2017 – 31 March 2018².

The amount of Spinning Reserve enabled is directly related to the size of the largest synchronised generation unit on the system as more generation must be held in reserve to arrest frequency drops caused by the sudden loss of larger generators. The loss of smaller units may also impact on frequency and the spinning reserve service may be utilised, but not to the full capacity available.

The cost of providing the Spinning Reserve Ancillary Service is currently recovered from all generators with output of at least 10 MW synchronised to the system in a given Trading Interval. The current cost recovery methodology for Spinning Reserve is contained in Appendix 2 of the WEM Rules wherein costs are allocated based on a system of predetermined blocks with increasing costs for each block. Generators with output of less than 10 MW do not contribute towards Spinning Reserve costs.

¹ See page 10 of the Ancillary Services Report 2018/19, System Management, June 2018 available from <https://www.aemo.com.au/-/media/Files/Electricity/WEM/Data/System-Management-Reports/2018/2018-Ancillary-Services-Report.pdf>

² Ibid, page 13

All generators with output of more than 10 MW contribute in equal shares towards the cost of the first 45 MW of Spinning Reserve costs. All generators with output in excess of 45 MW contribute in equal shares towards the cost of Spinning Reserve costs for the next 20 MW (cut-off at 65 MW). This pattern is replicated for a total of five different blocks with the last block consisting of generators with output more than 200 MW. This methodology is sometimes referred to as the “modified runway” approach and ensures that large generators contribute more towards the cost than smaller generators, to reflect the different levels of cost associated with providing Spinning Reserve to cover the loss of different sized generators.

The Public Utilities Office considers the current modified runway approach can be improved to provide better cost reflectivity for the allocation of Spinning Reserve costs and proposes to replace the modified runway approach with a “full runway” approach.

Under the “full runway” approach, it is proposed that each generator will pay for its full share of Spinning Reserve costs with a more dynamic approach applied to the concept of the value of holding a marginal MW of Spinning Reserve. The concept of blocks is proposed to be replaced with a calculation that will effectively provide an individual value for each generator synchronised to the system with output in excess of 10 MW. The approach is more granular and has the ability to more accurately reflect additional cost to the system for holding an additional MW of Spinning Reserve, as opposed to the current approach where cost differences within a block are averaged across all generators in that block, leading to some paying more and some paying less than the actual cost they are imposing on the system.

Full details of the proposed algorithm to implement the change are provided in section 3 of this Rule Change Proposal.

2. Explain the reason for the degree of urgency:

The Public Utilities Office suggests this Rule Change proposal be progressed with a high urgency rating as the proposal:

- Ensures the cost of providing Spinning Reserve more accurately reflects each generator’s additional cost to the system, thus applying a causer-pays principle to cost allocation.
- Is consistent with the current Wholesale Electricity Market reform program and will provide early benefits by reducing any cross-subsidies inherent in the existing approach.
- Responds to concerns raised by members of the Market Advisory Committee indicating a high degree of support for a more granular approach to the allocation of Spinning Reserve costs.

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

The Public Utilities Office considers that the proposed changes can be implemented via amendments to Appendix 2 of the WEM Rules only. The proposed amendments are as follows:

Appendix 2: Spinning Reserve Cost Allocation

This Appendix determines the value of SR_Share (p,t) of the Spinning Reserve service payment costs in Trading Interval t to be borne by Market Participant p.

In this Appendix the relevant Market Participant p is the Market Participant to whom a facility is registered, with the exception that in the case of unregistered generation systems serving Intermittent Loads, the relevant Market Participant p is the Market Participant to whom the Intermittent Load is registered.

The calculations in this Appendix are based on data for a set of applicable facilities (indexed by f) where this set comprises all Scheduled Generators and all Non-Scheduled Generators registered during Trading Interval t, except those Intermittent Generators exempted under clause 2.30A.2. This set also includes all unregistered generation systems serving Intermittent Loads.

Step 1: For the purpose of determining the SR_Share (p,t) values, each applicable facility f has an applicable capacity associated with it for Trading Interval t.

- If facility f is an Intermittent Generator with an interval meter then this is double the MWh average interval meter reading for the Trading Month containing Trading Interval t.
- If facility f is a Scheduled Generator with an interval meter then this is double the MWh interval meter reading for Trading Interval t.
- If facility f is a Scheduled Generator that is the sum of more than one aggregated Facility, each with an interval meter and each injecting energy at an individual network connection point to the South West interconnected system, then each individual Facility is treated as an individual Scheduled Generator under Appendix 2.
- If facility f is a Synergy Intermittent Generator without an interval meter then this is double the average monthly MWh sent out generation of that facility based on SCADA data over the Trading Month containing Trading Interval t.
- If facility f is a Synergy Scheduled Generator without an interval meter or an unmetered generation system serving Intermittent Load then this is double the MWh sent out generation of that facility based on SCADA data for Trading Interval t.

The applicable capacity value is set to zero if:

1. facility f was not synchronised to the SWIS during the whole Trading Interval t, or
2. the applicable capacity value for facility f resulting from the process described in the bullet points in this Step 1 is less than or equal to 10.

Step 2: For each Trading Interval t, rank all facilities f in ascending order from the facility with the lowest applicable capacity to the facility with the highest applicable capacity, as

determined in accordance with Step 1. If two or more facilities have the same applicable capacity in Trading Interval t, these facilities are ranked in random order by AEMO.

STEP 3: For each facility f determine the Facility Spinning Reserve Share for Trading Interval t as:

$$FSRS(f, t) = \frac{\sum_{i=1}^{rank(f)} MW(i) - MW(i - 1)}{MW(n) \times (n + 1 - i)}$$

Where:

i is the ranking number of facility f determined in Step 2.

n is the total number of applicable facilities.

rank(f) is the rank of facility f as determined under Step 2.

MW(i) is the applicable capacity associated with facility f at rank i.

MW(i - 1) is the applicable capacity associated with the facility ranked immediately prior to facility ranked i. Where i=1, the value of MW(i - 1) is zero.

MW(n) is the applicable capacity associated with the facility at rank n.

Step 4: For each Trading Interval t, calculate the SR Share(p,t) value for each Market Participant as:

$$SR\ Share(p, t) = \sum_{f \in F} FSRS(f, t)$$

Where:

F is the set of applicable facilities belonging to Market Participant p.

f is a member of the set in F.

FSRS(f,t) is the Facility Spinning Reserve Share for facility f in Trading Interval t calculated in Step 3.

The methodology makes use of the data in Table 1.

Block Number	Block Range (MW)	Block Size (MW)
1	>200	100
2	>125 and ≤ 200	75
3	>65 and ≤ 125	60
4	>45 and ≤ 65	20

5	>10 and ≤ 45	35
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Table 1: Data for Determine Reserve_Share(p,t)

For each Block, indicated by block number b, in Table 1, the Reserve Block Share is:

If $\text{Sum}(f(i \leq)) > 0$

$$\text{RBS}(b) = [\text{Block Size}(b) / \text{Sum}(i, \text{Block Size}(i))] / \text{Sum}(f(i \leq), \text{TIS}(f))$$

If $\text{Sum}(f(i \leq)) = 0$

$$\text{RBS}(b) = 0$$

Where

Block Size(i) is the size of the Block with block number i listed in Table 1.

$f(i \leq)$ is the subset of applicable facilities that had applicable capacities for Trading Interval t lying within the block range of any Block with a block number value of b or less.

TIS(f) is 1 if the applicable facility f was synchronised to the SWIS during Trading Interval t, and is zero otherwise.

For each Block b in Table 1, the Reserve Generator Share is:

$$\text{RGS}(b) = \text{Sum}(i \geq, \text{RBS}(i))$$

Where

$i \geq$ is the set of Blocks listed in Table 1 that have a block number i greater than or equal to b.

For each Market Participant p, its unadjusted share of the Spinning Reserve service payment costs for the Trading Interval is:

$$\text{USHARE}(p) = \text{Sum}(f(p), \text{RGS}(b(f)) \times \text{TIS}(f))$$

Where

$f(p)$ is the set of applicable facilities for the Market Participant p that have applicable capacities within one of the block ranges listed in Table 1.

$b(f)$ is the block number of the Block in Table 1 that has a block range that corresponds to the applicable capacity of the applicable facility f.

TIS(f) is 1 if the applicable facility f was synchronised to the SWIS during Trading Interval t, and is zero otherwise.

For each Market Participant p, its adjusted share of the Spinning Reserve services payment costs for Trading Interval t is:

$$\text{SR_Share}(p,t) = \text{USHARE}(p) / \text{sum}(q, \text{USHARE}(q))$$

Where

q is the index of the set of all Market Participants.

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

- (a) to promote the economically efficient, safe and reliable production and supply of electricity and electricity related services in the South West interconnected system;**

The proposed changes will provide more cost reflective signals to generators in relation to the costs of the Spinning Reserve service associated with different loading levels for the generator. A more accurate input for the Spinning Reserve component is likely to lead to more efficient decisions with respect to bidding and dispatch of individual facilities, as it will reduce inefficient incentives for a generating unit to fall within a particular block for Spinning Reserve costs. Transparency and accuracy in reflecting the Spinning Reserve cost share to Market Participants is likely to lead to more efficient outcomes in all aspects of the WEM, including the Short Term Energy Market (STEM) and in the Balancing Market.

- (b) to encourage competition among generators and retailers in the South West interconnected system, including by facilitating efficient entry of new competitors;**

The improved cost reflectivity is likely to positively impact on generator competition as any inherent cross-subsidies within the current block system will be removed and a more level playing field will be enabled. For investors, the improved and more accurate cost allocation is likely to lead to more appropriate decisions on plant configurations as inefficient incentives to fit capacity “into a particular block” will be removed. This in turn will lead to investment decisions aligned with economic principles and more timely generator entry.

- (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;**

The Public Utilities Office does not consider the proposed changes will impact on this Market Objective.

- (d) to minimise the long-term cost of electricity supplied to customers from the South West interconnected system; and**

The proposed amendment to the cost allocation methodology should lead to better cost reflectivity of Spinning Reserve costs and remove any incentives for sub-optimal generation designs and bidding or dispatch behaviour to fit into certain blocks. This will lead to more efficient investments in a suitable generation mix for the South West Interconnected System, with reduced costs and improve power supply reliability for end use consumers over the longer term.

- (e) to encourage the taking of measures to manage the amount of electricity used and when it is used.**

The Public Utilities Office does not consider the proposed changes will impact on this Market Objective.

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

Preliminary estimates from AEMO indicate that approximately \$250,000 will be incurred to implement the associated system changes.