

Minutes

Meeting Title:	RC_2017_02 Implementation of 30-minute Balancing Gate Closure Workshop
Date:	6 September 2019
Time:	10:00 AM – 12:30 PM
Location:	Training Room 1, Albert Facey House 469 Wellington Street, Perth

Attendees	Class	Comment
Stephen Eliot	RCP Support	
Jenny Laidlaw	RCP Support	
Natalie Robins	RCP Support	
Richard Cheng	RCP Support	
Sandra Ng Wing Lit	RCP Support	
Matthew Fairclough	Australian Energy Market Operator (AEMO)	
Martin Maticka	AEMO	
Dean Sharafi	AEMO	
Aditi Varma	Energy Policy of Western Australia (EPWA)	
Patrick Peake	Perth Energy	
John Nguyen	Perth Energy	
Brad Huppertz	Synergy	
Wendy Ng	ERM Power	
Quentin Jeay	Kleenheat	
Noel Schubert	Economic Regulation Authority (ERA)	
Daniel Kurz	Bluewaters Power	
Paul Arias	Bluewaters Power	Conference call
Tim McLeod	Amanda Energy	
Geoff Down	Water Corporation	
Jacinda Papps	Alinta Energy	
Adam Stephen	Alinta Energy	
Erin Stone	Perth Energy	Conference call

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1-5	<p>Introduction to Workshop and RC_2017_02</p> <p>Ms Natalie Robins introduced the purpose of the workshop, the purpose of Rule Change Proposal RC_2017_02, the assessment criteria for the proposal, and its context within a market that is evolving with an increased penetration of variable renewable generation.</p>	
6-7	<p>Issue 1: Comparing Options</p> <p>Ms Robins noted that shortening the time horizon of power system operation can help to reduce the unpredictability of wind and solar, but System Management needs a reasonable time period to maintain system security given that it still relies on some manual processes. Ms Robins noted that System Management has indicated that a 30-minute Balancing Gate Closure (BGC) is not feasible, but it can do 90-minutes, and can do 60-minutes most of the time, but it would experience some difficulties in some Trading Intervals. Ms Robins explained that AEMO had noted in 2017 that it needed a longer lead time to effect the chosen Balancing Portfolio Dispatch Plan, and to position slow ramping coal units to provide the required energy, aggregate ramp rate or Ancillary Services. In extreme cases, if the Balancing Portfolio could not be moved in time, this would lead to the potential for increased constrained on and off compensation, which is not in the interests of consumers.</p>	
8-9	<p>Existing Issue – Aggregate Ramping</p> <p>Ms Robins considered that one of System Management’s main issues from the AEMO submission related to aggregate ramping of IPPs in the early minutes of the Trading Interval, which requires preparatory scheduling of the Balancing Portfolio to offset the IPP ramping, without materially eroding the Ancillary Service quantities. Load Rejection Reserve (LRR) is provided by Synergy’s slow ramping Muja unit, and System Management dispatches according to Synergy’s guidelines and is obligated to minimize changes to Synergy’s dispatch plan. Ms Robins noted that the time horizon of power system operation and outcomes in the market are determined by the ‘must run’ of Synergy’s coal plant. Ms Robins questioned whether this was because of an economic decision by Synergy, or by System Management to</p>	

maintain system security; and whether it is appropriate that the timeframe cannot be shortened for this reason?

Mr Patrick Peake considered that Synergy should just accelerate its ramp rate but conceded that this was not a practical proposition.

Mr Brad Huppatz considered that coal ramp rates in the interval are not necessarily the issue, but rather a combination of the Synergy Balancing Portfolio operating at its minimum, and its balancing capabilities being used to accommodate the ramp rates, not clearing the load following.

Mr Huppatz considered that the coal ramp rate would be more of an issue at a 60-minute BGC than at a 90-minute BGC.

Mr Huppatz explained that, as a Portfolio, Synergy are increasingly at minimum volumes to provide the energy and Ancillary Services that they have cleared for, and to accommodate the ramp rate when they are not marginal, they have to back their coal plant down in the interval so that gas plant can respond and then bring them back up to a net zero position. Mr Huppatz considered that Synergy do not have the ability to respond at minimum volumes and that the market should move to accommodate the ramp in this situation, not Synergy.

Mr Huppatz questioned whether the issue is because of slow coal ramp rates or because Synergy's Balancing Portfolio is being asked to ramp at a higher ramp rate than Synergy have bid in its submission.

Mr Noel Schubert questioned whether increased participation of IPPs in providing ancillary services so that the market is not so reliant on the Balancing Portfolio would relieve some of this issue. Mr Schubert considered that IPPs could provide more Ancillary Services if there was a concerted effort to understand what they can and cannot do, what their restrictions are, and to encourage them to tender for provision of the Ancillary Services. Mr Schubert noted that one of the respondents in an expression of interest for an Ancillary Service did not understand what was required to provide the service, which suggested that the information provided and the timeframe to absorb it was insufficient to enable them to offer something of value.

Ms Jacinda Papps advised that consideration must be given to the cost, and to whether the Margin Values, or providing a discount to that, would attract IPPs, which is a broader problem than just talking to the participants. Ms Papps considered that System Management had talked to Market Participants quite a lot about providing Ancillary Services.

Mr Dean Sharafi explained that the use of LFAS as a means of facilitating the market was a mistake in the market design, and

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	<p>that LFAS is to keep the system secure, not to enable the market to run. Mr Sharafi noted that Synergy’s Balancing Portfolio is also used to facilitate the market, with the ramping of IPPs compensated by moving Synergy in the opposite direction to keep the balance between load and generation. Accordingly, Mr Sharafi considered that LFAS is the focus of discussion, not other Ancillary Services.</p> <p>Ms Robins considered that this was different to what she understood, which was that System Management had been eating into LRR and LFAS to address the aggregate ramp issue. Mr Schubert questioned whether Spinning Reserve and LRR are constraining System Management’s ability to use the Balancing Portfolio for LFAS and to solve this problem. Mr Sharafi acknowledged that the way System Management dispatches Synergy makes balancing and LFAS a bit mixed, and that System Management uses some LRR but considered that the focus should be on LFAS and how it is used to enable the market.</p> <p>Mr Daniel Kurz questioned whether the 28 August 2019 change to the LFAS quantities were incorporated into AEMO’s current views or whether that changed the dynamic even further. Mr Martin Maticka and Mr Huppertz noted that increasing the LFAS limit would make it increasingly difficult to manage the situation.</p> <p>Mr Peake considered that Perth Energy would like to see the gate closure as short as possible, but that it is aware of the significant issues faced by Synergy and System Management, so it would be reluctant to see the BGC pushed beyond what can be accommodated on a regular basis and under difficult situations. Mr Peake did not want to be in a position where System Management cannot organize themselves within 60 or 90 minutes.</p> <p>Ms Robins noted that AEMO reported in 2016 that the aggregate ramp problem occurred less than 4% of the time and questioned whether System Management knew how frequently this is occurring now. Mr Fairclough suggested that the frequency depends on a lot of factors as an outcome of bidding and that this was the next thing that AEMO will work through.</p>	
10	<p>Existing Issue – Aggregate Ramping</p> <p>Ms Robins noted that the aggregate ramp issue already exists outside of the Rule Change Proposal but must be considered if reducing the BGC exacerbates the issue, leading to risks to system security. Accordingly, it’s important to understand the options. Synergy is required to provide Ancillary Services to a</p>	

standard sufficient to enable System Management to meet its obligations. Noting that the slow ramping coal had been sufficient to meet the market requirements, Ms Robins questioned whether slow ramping coal was still sufficient.

Mr Huppatz considered that Synergy's plant can and does sufficiently meet the Ancillary Services requirements, it provides the LRR when it is on and while its ramp is slow, it is sufficient to meet individual targets. Mr Huppatz considered that the question is whether Synergy is being asked to do more than meet the Ancillary Services. Synergy may not be capable of meeting intra interval movements that are in excess of its average ramp rate.

Ms Robins noted that System Management must procure adequate Ancillary Services and asked whether the market had evolved to the point where System Management needs to ask IPPs to provide more Ancillary Services, or for Synergy to provide more from another plant. Ms Robins noted further that System Management has other options: it can monitor and increase the Ancillary Service requirements or use a Dispatch Support Service (**DSS**). However, there was no mention of an increase in LFAS to address the aggregate ramping issue in the annual Ancillary Services report for this year, so it is not clear whether this will be required if the BGC is reduced. There was also no mention of a DSS to address the aggregate ramp issue, although there was mention of a possible DSS for inertia, leading to the question of just how much of an issue the aggregate ramping really is. Finally, Ms Robins noted that System Management had employed LRR and LFAS previously to address the aggregate ramping issue, but its reading of the rules had changed recently so that only uninstructed fluctuations can be addressed using LFAS, rather than instructed fluctuations. Ms Robins provided the example that a movement is 'instructed' if System Management dispatches a plant and it is an 'instructed fluctuation' if the plant overshoots demand.

Mr Sharafi agreed that the market design is to allow LFAS to enable aggregate ramp but considered that LFAS is supposed to be used to balance changes in demand and supply in real time. Ms Jenny Laidlaw considered that, when explaining how the real time dispatch engine (**RTDE**) works, it had been acknowledged from the start of the Balancing Market up until last week that load following would account for the difference when someone ramped faster than System Management would like. This is because of how the RTDE and the Theoretical Energy Schedule (**TES**) work. Ms Laidlaw questioned whether the change in approach was due to an event, a degeneration in performance, an increased security risk, or whether System Management was running out of LFAS.

Mr Sharafi considered that there are more recent instances of sudden changes in the system and provided an example from

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	<p>the previous weekend where the system went to 52 Hz because a cloud front came and disappeared in a very short period, requiring 400 MW of ramp, and causing one facility to trip on over frequency as if it were a contingency. Mr Fairclough stated that uninstructed events that disrupt power system security are happening more frequently and with greater magnitude, but System Management had not yet undertaken an analysis to show this. Mr Fairclough considered that the effectiveness of LFAS is reduced if it is used to address aggregate ramping or an instructed issue at any point in time. The environment is changing such that the need for LFAS has increased and there is no longer as much flexibility. Additionally, the rules require System Management to set the LFAS requirement in a way that does not include instructed deviations, which leaves System Management stuck on both fronts.</p> <p>Ms Laidlaw noted that the LFAS requirement had never been set according to the Market Rules because there would never be enough, but that this is probably a separate issue.</p> <p>Ms Robins questioned whether DSS was being considered. Mr Sharafi indicated that System Management is not considering DSS because it cannot get through the current Ancillary Service mechanism or definitions. Mr Sharafi noted that a DSS could be used soon for inertia because there is no Ancillary Service for inertia, but there is a defined Ancillary Service that System Management can use to procure LFAS.</p> <p>Ms Robins sought clarification on the 'defined service' given the position that LFAS cannot be used for instructed fluctuations.</p> <p>Mr Fairclough explained that AEMO only considers DSS to address issues when it has no other tools to address the issue. AEMO would not look at DSS to address aggregate ramping unless it had exhausted all other options and, at this stage, AEMO had not exhausted everything.</p>	
11	<p>Options to Address Aggregate Ramping</p> <p>Ms Robins presented a checklist of principles that can be used to assess whether the mechanisms developed to address the aggregate ramping issue are appropriate, noting that the list was not exhaustive and could include other things, such as the causer pays principle.</p>	
12	<p>Option – Linear Ramping</p> <p>Ms Robins noted that in 2017, AEMO suggested that either linear or staggered ramping may allow for a move to 60-minute BGC. AEMO has now suggested that it will implement linear ramping irrespective of this Rule Change Proposal. Some of the</p>	

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	<p>benefits are that System Management currently uses linear ramping in Emergency Operating States, this approach is consistent with where the Energy Transformation Implementation Unit (ETIU) market reforms are headed, and it removes any concerns that System Management has about aggregate ramping.</p> <p>Ms Papps noted that ETIU is moving toward linear ramping but that it will be over a five-minute period, which is quite a different concept to linear ramping over 30 minutes.</p>	
	<p>Presentation by AEMO on Linear Ramping</p> <p>AEMO SLIDE 2:</p> <p>Mr Fairclough explained that the WEM rules are designed to balance generation and demand at the end of the Trading Interval, which is not required at any other point in the Trading Interval. AEMO tries to balance the system to maintain frequency, but there is always imbalance during the Trading Interval and the question is about the nature of the imbalance and how AEMO deals with it. Any movement of a facility during the interval can affect that balance, whether the movement is scheduled or unscheduled. A scheduled movement is what AEMO says in a Dispatch Instruction or a Dispatch Order to Synergy. Load following is set to cover unscheduled movements of generation to maintain that balance (i.e. LFAS is to balance the system if the wind moves or clouds come over). Ramping of any generator is a scheduled movement.</p> <p>However, Ms Laidlaw noted that LFAS can be used to address the aggregate ramping issue, and that it has been used for that purpose for the last seven years.</p> <p>Mr Fairclough agreed with Miss Laidlaw. Mr Fairclough considered that, if there is a scheduled movement that impacts the balance, and nothing else happens, then the LFAS facility will move to take up that slack, and its ability to then respond to anything else is reduced. This can have consequential impacts on Spinning Reserve and LRR because LFAS is used for those facilities, though it is generally no longer a problem for LRR.</p> <p>Ms Laidlaw questioned whether it was AEMO's choice to double LFAS down and LRR. Mr Fairclough confirmed that it was AEMO's choice.</p> <p>Mr Fairclough considered that the availability of LFAS is now more important because of the increased frequency and magnitude of unscheduled events, with three back-up LFAS events occurring in the last three weeks, even before next year when another 400 MW of wind will join the system.</p>	

Mr Fairclough cautioned that even with the increased requirement for LFAS, there have been LRR events caused by cloud cover and events are occurring that AEMO has never seen before.

AEMO SLIDE 3:

Mr Fairclough explained that AEMO excludes any machines that are providing LFAS when it considers the capability of the Balancing Portfolio, because these machines cannot respond to an unscheduled movement if they are responding to a scheduled movement. This generally limits the Balancing Portfolio ramp rate, so it is often easy for scheduled non-Synergy movements to exceed the Balancing Portfolio ramp rate, leading to the aggregate ramping issue. AEMO's tools to respond to aggregate non-scheduled movements in a normal operating state are to:

- (1) displace the Balancing Portfolio to offset it, if it is in the interval and the Balancing Portfolio is available to move within the interval;
- (2) dispatch the Balancing Portfolio in advance of the interval to reduce the impact and duration on use of LFAS facilities; and
- (3) constrain non-Synergy facilities.

Mr Peake considered that all these options have a cost.

Mr Fairclough agreed, and indicated that a move to a 60-minute BGC will preclude the second option, which would limit AEMO to either dispatching the Balancing Portfolio or issuing dispatch instructions.

In response to a question from Ms Laidlaw, Mr Fairclough confirmed that a move to a 60-minute BGC would preclude the second option, not just reduce it, because AEMO would not have time to implement option (2).

Ms Laidlaw questioned what exactly AEMO does with dispatch in advance and when it does it. It was explained that AEMO rearranges the position of coal and gas within the Balancing Portfolio so that it has a faster ramp rate than it would otherwise have during that Trading Interval, and it can move upward or downwards, or sometimes upwards and downwards, as required in that Trading Interval.

AEMO SLIDE 4:

Mr Fairclough presented a chart indicating the impact on the Balancing Portfolio when one IPP ramps up and another ramps down at a different ramp rate. It was noted that there is no change in the generation by the Balancing Portfolio at the end of the Trading Interval, but that it needs to move within the Trading Interval to account for the differing ramp rates for the IPPs.

It was noted that there is an error in the chart and that the blue and red lines should be inverted.

AEMO SLIDE 5:

Mr Fairclough presented a chart showing the Balancing Portfolio's ramp up capability over time and explained that AEMO had analysed a year's worth of data for every facility in the portfolio to determine the ramp rate of the facilities for every four seconds. A facility was excluded from the analysis if it was operating near its maximum or minimum so that it did not have the ability to move to the necessary ramp rate in the next minute or if it was providing LFAS.

Mr Fairclough showed that the Balancing Portfolio has a ramp rate less than 20 MW/minute in about 20% of the Trading Intervals and indicated that the Balancing Portfolio may have insufficient ramp up capability in these intervals. Mr Fairclough also showed that the ramp rate for the Balancing Portfolio varies substantially from year-to-year.

AEMO SLIDE 6:

Mr Fairclough presented a chart like the chart in slide 5 but showing the Balancing Portfolio's ramp down capability. Mr Fairclough noted that the ramp is less than 20 MW/minute for almost 40% of the time.

Ms Laidlaw noted that Synergy's Balancing Submissions normally have a 15 MW/minute ramp rate and questioned how often the ramp rate was below this value. Mr Fairclough explained that it is virtually always greater than 15 MW/minute if every facility in the Balancing Portfolio is considered, but not if LFAS facilities were excluded.

Ms Laidlaw questioned the rationale for removing of the LFAS facilities, explaining that two different things were being considered. Firstly, if NewGen or Alinta is providing LFAS, they get sent to a set point and that set point can change. They can be rebalanced and move to different places in a Trading Interval and then they provide LFAS around that. Secondly, if the Balancing Portfolio has notional dispatch instructions, if nothing else happened but the demand went down and Synergy was a marginal unit, it would be dispatched down and the RTDE would think that it is going at 15 MW/minute. Ms Laidlaw questioned whether, if Synergy did not have 15 MW/minute, AEMO would use LFAS to pick that up. Mr Fairclough confirmed that this would be the case.

Mr Huppertz considered that this comes down to how the facilities are dispatched and noted that Synergy had moved from clearing 70 MW of LFAS to zero. Ms Laidlaw clarified that she was not suggesting that there are no issues for Synergy, but that the Balancing Portfolio provides a balancing function, including a

rebalancing at 10 and 20 minutes notionally, as well as providing LFAS and Spinning Reserve. The dispatch mechanism dispatches other people up/down to certain levels based on the assumption that this notional big generator (i.e. Synergy) can go at 15 MW/minute. Part of why the other participants get sent long distances is because the RTDE thinks that it has something (i.e. Synergy) that can go the other way.

AEMO SLIDE 7:

Mr Fairclough highlighted differences between January and February of this year in the ramp up and down rates of the Portfolio, noting that the participation of the Balancing Portfolio in the LFAS market changed significantly at the start of February, which means that AEMO's ability to use the Balancing Portfolio for intra-interval balancing is increasing.

AEMO SLIDE 8:

Mr Fairclough noted that more analysis needs to be done, but AEMO's preliminary conclusion is that the ramp rate has varied over time due to changes over the years in the total quantity that is being cleared by the Balancing Portfolio and to dramatic changes in the clearance of LFAS. Currently, AEMO is faced with:

- downward ramp less than 20 MW/minute about 38% of the time and less than 10 MW/minute about 3% of the time; and
- upward ramp less than 20 MW/minute about 25% of the time and less than 10 MW/minute about 2% of the time.

Mr Fairclough explained that AEMO will next come up with methods to forecast the Balancing Portfolio capability.

AEMO SLIDE 9:

Mr Fairclough considered that up to now, AEMO has used the ramp rates specified in Balancing Submissions and only varies the ramp rates as a last resort, when there is a High-Risk Operating State, because doing so will result in constrained off payments.

Mr Fairclough explained that the aggregate ramp issue arises because generators ramp at different rates to how the load is moving. With linear ramping, there still could be mismatches if Synergy's Balancing Portfolio does not ramp at its expected ramp rate, but they should net out in most cases and there will be no aggregate ramp issue.

To do linear ramping, when the BMO finishes, AEMO will assess the forecast ramping capability of the Balancing Portfolio, and the demand and other factors, and if the aggregate ramping exceeds the capability of the Balancing Portfolio, then AEMO will set the ramp rates to linear. AEMO will issue every non-Synergy facility a Dispatch Instruction to go to a point at the end of the

interval via a ramp rate determined by AEMO. To match the linear ramping of the non-Synergy facility, AEMO will also linear ramp the Balancing Portfolio.

The ramp rates in the Dispatch Instructions for Non-Portfolio facilities may be less than their ramp rate limits and will be calculated by taking the changing quantity over the interval and dividing it by the number of minutes left in the interval, whenever the instruction is given. AEMO will average the solution so that the resulting ramp rates do not have decimals.

Mr Fairclough noted that AEMO had reviewed the Market Rules and concluded it can do linear ramping now, without the dispatch being out of merit. However, any change to the ramp rates from the ramp rate limits would result in constrained off payments, resulting in costs.

Mr Huppertz asked Mr Fairclough to elaborate on why AEMO considers a scenario where the Balancing Portfolio ramp rate is exceeded, rather than what Synergy has bid for the Balancing Portfolio. Mr Fairclough noted that the Balancing Portfolio is used where possible to allow the market to function and that there are occasions within the interval when AEMO have no other tools to ensure a good outcome, so it moves the Balancing Portfolio up and down, but still meets the required outcome at the end of the interval.

Mr Fairclough indicated that AEMO would like to implement linear ramping now because it has had to use back-up LFAS three times in a week. Mr Peake sought clarification on whether it had to be linear ramping for a full 30-minutes, noting that there's re-dispatch at 10 and 20 minutes. It was Mr Fairclough's understanding that AEMO was looking at this and that it would have to determine exactly what the process is and when it would be used. Mr Fairclough considered that linear ramping would generally always be a last option and that, while AEMO is thinking about linear ramping for its current operations, AEMO is not going to introduce linear ramping tomorrow. However, Mr Fairclough considered that if there is a move to 60-minute BGC, AEMO will need to be able to implement linear ramping from that date.

Mr Fairclough noted that the distinction was that AEMO would need to automate linear ramping for 60-minute BGC but could implement it manually for a 90-minute BGC. Mr Fairclough considered that additionally, a move to an automated process would require a more conservative formula.

Ms Papps expressed concern that it may cause instability if the ramp rates could be anything up to the ramp rate limit because governors can be tuned to specific ramp rates but there are limits to the variability in the ramp rates that can be used.

Mr Sharafi considered that AEMO may not have visibility of this, which may create issues for generators.

Ms Laidlaw questioned whether linear ramping would be built into the RTDE as part of the automated solution. Mr Fairclough considered that there was no need to change the RTDE, as AEMO could simply change the ramp rate that it feeds into the RTDE. Mr Sharafi considered that the controller can manually override what goes into the RTDE.

Ms Laidlaw questioned how AEMO would work out what the units are going to be dispatched to, and therefore, who's going where, and at what speed, if AEMO does not look at it through the RTDE. Mr Fairclough considered that this would have to be considered in how AEMO implements linear ramping, as AEMO had not worked out exactly how it was going to work yet.

Mr Eliot noted that there are costs and timing implications associated with implementing an automatic process. Ms Robins questioned whether, if linear ramping is something planned in the longer term, the Rule Change Proposal should be held off while AEMO implements linear ramping or should proceed with some other option. Ms Robins noted that 400 MW of wind and 200 MW of residential solar will be added by mid-next year, so Market Participants may want to shorten the BGC now, rather than waiting to implement an aggregate ramping solution.

Ms Papps noted that Participants may need time to implement control system and governor changes to implement linear ramping, which requires outage planning, outages, testing, commissioning, and finding a supplier. There is not enough information and Participants don't have an outage plan or an outage scheduled, which makes it difficult to provide a timeframe.

Ms Robins considered that if work cannot start on implementing linear ramping until the end of next year, then the time frame is too close to when the market reforms will be implemented. The decision could be made to not implement linear ramping but to hold off for the reforms.

Mr Sharafi noted that AEMO had avoided making wholesale changes to the RTDE because it knew that the reforms would address most of the issues, with a different dispatch period and different structure to the Ancillary Services. Mr Sharafi considered that implementing linear ramp rates is a change that requires system changes, and consideration needs to be given to the efficiency of the solution and what can be gained from it.

Ms Laidlaw noted that the difference between the BGC options is that the advanced dispatch option is available for 90-minute BGC but not for 60-minute BGC and considered that, in a situation where Synergy has not got anything more to give,

AEMO would have nothing left to shift around and it would not matter what the BGC is.

Ms Laidlaw further considered that there is an equity issue when AEMO advance dispatches some units to increase Synergy's ramp rate to higher than 15 MW/minute, as AEMO is moving Synergy above what it puts in its Balancing Submissions and Synergy is not being compensated for providing the additional ramp. Ms Laidlaw considered that shifting around Synergy's dispatch arrangement to provide additional ramp sounds like LFAS. Mr Huppatz considered that it's not viable for Synergy to be at its minimum, which is often the case, and where it has zero clearing volume, and then being asked to move again. Synergy do not want to prop up the market, and the market should see the costs that are involved and should seek to minimise the total costs, not cross-subsidise them.

Ms Laidlaw explained that the RTDE sends Synergy to a point 30 minutes away, 20 minutes away and 10 minutes away; and that Synergy is also being moved up and down. It is very hard to distinguish between movement of the Balancing Portfolio and LFAS because of the way the Balancing Portfolio is dispatched and because it is often the same machine being used, but it becomes a bit clearer if Synergy is not providing any LFAS. Ms Laidlaw questioned whether the machines are still on in load following mode, even if they are not providing load following. Mr Sharafi confirmed that the machines are still on in load following mode and noted that AEMO dispatch Synergy every four seconds.

Mr Huppatz noted that Synergy is not always marginal and clearing for Ancillary Services. Mr Huppatz considered that he was not sure how the ramp rate minimum comes in, because if Synergy has cleared at minus \$1000/MWh, it is not expecting to move. Synergy might not have the down ramp at that point, because it cannot go lower, and it's not expected to, and is still compliant. Ms Laidlaw considered that it sounded as if the advanced dispatch would not work in these situations and questioned whether the number of these situations is growing.

Mr Huppatz considered the number is growing and noted that there will be circumstances where, because of increasing the Ancillary Service cap, regardless of the 90-minutes, Synergy will not be able to provide the necessary ramp. There were higher loads in the past, and Synergy was not at the floor, so AEMO could move its plant around to do that.

Mr Peake noted that, with linear ramping, he would hate to see a situation where plants are at less than their minimum as it will lead to issues with the ERA.

Mr Adam Stephen question whether using linear ramping to solve the instructed output fluctuation problem might cause more

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	<p>uninstructed fluctuation issues. Ms Robins considered that if AEMO are going to moderate a generator's ramp rate and there is a loss of revenue associated with generating less, then this would provide an incentive for Participants to increase their ramp rates to the maximum so that they will not lose as much if they are moderated, which will make the aggregate ramp issue worse.</p> <p>There was some discussion about whether participants are required to ramp at their maximum ramp rates. Mr Fairclough clarified that participants are required to be able to ramp at the ramp rate indicated in their Balancing Submissions, which is not necessarily always the facility's maximum ramp rate.</p>	
13	<p>Option – Linear Ramping</p> <p>Ms Robins questioned whether the simple solution is a change to the Market Rules for LFAS to reflect 'instructed' output fluctuations, and to continue to address the aggregate ramping issue using LFAS.</p> <p>Mr Fairclough noted that AEMO's next step is to assess the maximum capability of the Balancing Portfolio in every interval last year and determine how often the aggregate ramp issue occurred. However, Mr Fairclough considered that past behaviour is not necessarily a good indicator of the future.</p> <p>Ms Laidlaw questioned whether AEMO's concern with including instructed fluctuations in the LFAS requirement was that it might be breaching the Rules. Mr Fairclough questioned whether, if AEMO decided to include instructed output fluctuations in the LFAS requirement, even though this is not in the rules, it would be efficient for the LFAS requirement to be a lot more than it currently is. Ms Robins noted that the LFAS has been used to address this issue in the past. Mr Fairclough considered that AEMO had more LFAS available in the past, so it was okay. Mr Sharafi stated that LFAS should not be used but, if there is an imbalance, the LFAS kicks in and resolves the issue because of Automatic Generation Control.</p> <p>Ms Robins noted that the Annual Ancillary Services Report presents a figure that says that frequency is maintained 99.998% of the time. Ms Robins questioned how close the market is to affecting that figure, based on what AEMO had said today. Mr Sharafi considered that the performance of frequency relates to LFAS to some extent, but it also relates to other things like the response of the generators in the system (such as droop</p>	

control), so a direct connection cannot be made between frequency performance and LFAS.

Mr Sharafi considered that AEMO would need to implement automated linear ramping to move to a 60-minute BGC, because it is beyond the capacity of a human being to deal with that issue in that short period of time.

Mr Stephens offered that linear ramping is employed in the NEM, but that it's a five-minute interval, not a half hour interval, and ramping occurs at the ramp rates in the bidding, which doesn't get moderated. Ms Laidlaw considered that in three years' time, there won't necessarily need to be linear ramping because LFAS can pick up small imbalances with a 5-minute dispatch cycle. This means that the cost to make everyone switch to linear ramping would be required for a short-term solution. Ms Papps considered that the cost to implement the linear ramping for 30 minutes might be quite different, and that the solution is quite different, from five minutes. Ms Varma considered that a different world is being contemplated in 2022 and that there is no consideration of a 30-minute BGC in the future.

Mr Eliot noted that questions of cost and practicality cannot be answered if we do not know how the linear ramping model is going to work. Mr Fairclough considered that AEMO would have to come up with a formula for how it would implement linear ramping and that this formula would apply whether AEMO did it manually or used an automated process. Mr Fairclough noted that the requirement to ramp linearly would be lower with a 90-minute BGC, leading to a difference in the amount of constrained off payments between the two scenarios.

Mr Fairclough considered that AEMO could give an indication of the difference between constrained off payments, based on last year, and then consider the cost of creating the system.

Ms Robins questioned whether AEMO needed to implement linear ramping regardless of a reduction in the BGC. Mr Sharafi considered that AEMO may have to implement it, but it has not yet completed its analysis. AEMO is witnessing much more volatility on the grid, so it sometimes needs to limit the ramp rate of generators, but it can currently do this by manual intervention. AEMO will not change its systems to implement automatic linear ramping if 60-minute BGC is not implemented. With manual intervention, the controller sees that it cannot respond to a fast movement of generators so he or she limits the ramp rate of some of the units. The other option is to constrain the generator, which is done under not normal conditions.

There was discussion on whether an understanding of how linear ramping would work and its costs to AEMO and Market Participants would be required prior to publishing a Draft Rule

Change Report and Attendees agreed that that would be quite a large process.

Mr Sharafi urged attendees to consider the Rule Change Proposal in of the reform program and its time frames and noted that System Management does not have any resources to focus on other things.

Ms Laidlaw questioned what AEMO would do if a shorter BGC was not implemented, whether it would continue to use the combination of pre-advanced dispatch and LFAS, and whether AEMO would have the same concerns about using LFAS and its effect on system security. Mr Sharafi confirmed that this was the case and that AEMO would still have these concerns.

Mr Fairclough considered that if there is a greater frequency and impost of unscheduled movements, AEMO are likely to get into the situation of constraining IPPs more often. AEMO do not want to introduce linear ramping now because it knows that it costs everyone but considers that this is the way things are heading. Mr Fairclough considered that the change to BGC had not instigated AEMO's view on the use of LFAS.

Ms Laidlaw sought clarification on whether AEMO is removing LFAS as an option to deal with the aggregate ramp issue. Mr Fairclough confirmed that this was the case. Ms Laidlaw questioned whether AEMO therefore needed to set up the first part of the automated system, to check every Trading Interval to see whether it will use LFAS, and therefore need to use one of the remaining options to address the aggregate ramp issue. Mr Fairclough considered that AEMO already have the tools to do this, to a degree, so it doesn't need to build something to get the information.

Ms Laidlaw sought clarification on whether AEMO knows when it needs to linear ramp and questioned whether it was just that more often than not, AEMO are moving the Balancing Portfolio around to solve the problem. Mr Fairclough considered that AEMO uses the Balancing Portfolio on 99% of occasions.

Ms Laidlaw questioned whether AEMO were only rarely using LFAS, as it was her understanding that it would been the tool most commonly used by AEMO. Mr Fairclough considered that if AEMO did not do anything else, it would default to LFAS.

Ms Laidlaw questioned whether AEMO were proposing that, in the frequent set of situations when the imbalance was only small, it was going to use linear ramping rather than LFAS. Mr Fairclough considered that AEMO was not thinking about the times when there was a little impost, which would be business as usual, but more the times when there is a 10 MW/minute or higher impost.

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	<p>Ms Laidlaw questioned whether AEMO would have a threshold of LFAS usage that it would determine, and beyond that threshold would then go to linear ramping? Mr Fairclough considered that there wouldn't be an LFAS threshold, but that the automation would be based on AEMO's assumptions about what the Balancing Portfolio could do.</p> <p>Action: RCP Support to hold a second workshop.</p> <p>Action: MAC Members to advise the Panel on what they want them to do regarding linear ramping.</p>	<p>RCP Support</p> <p>MAC Members</p>
<p>14-15</p>	<p>Option – Staggered Ramping</p> <p>Ms Robins noted that many of the same issues that must be considered for linear ramping will need to be considered for aggregate ramping and that information would be sought from Market Participants on this topic in a follow up email to the workshop.</p>	
<p>16</p>	<p>Issue 2: Synergy's Gate Closure</p> <p>Ms Robins noted that the forecast is 10.5 hours ahead of the first Trading Interval and 16 hours ahead of the last Trading Interval in the related LFAS block. There was some confusion around when Synergy's LFAS gate closure occurs under the Market Rules, with most Participants assuming that the LFAS gate closure was the same for Synergy as for IPPs. Attendees agreed to address this question outside of the workshop.</p> <p>Ms Robins considered that, if the gate closure is reduced for IPPs, then it would seem reasonable to also reduce Synergy's gate closure but cautioned that Synergy is the dominant player in the market and there is a need to avoid infeasible dispatch.</p> <p>Mr Huppertz noted that Synergy had indicated in its submission that it should be treated on a level playing field and should have the same gate closure as IPPs.</p> <p>Mr Sharafi considered that AEMO does not mind if Synergy's gate closure is the same as everyone else's, so long as LFAS gate closure is before that. The attendees agreed that there was no need to disrupt the order of gate closures, with Synergy gate closure following LFAS gate closure.</p> <p>Mr Peake and Ms Papps considered that Synergy's gate closure should be as close as possible to the BGC but should not be the same, as this would be most efficient for the market. Ms Papps noted there are probably still some things about the Balancing</p>	

Portfolio that are different than for IPPs, which requires a different gate closure for Synergy.

Ms Robins noted that consideration needed to be given to what IPPs need to do in the time between Synergy's gate closure and when they bid, and how long they need to do it. Ms Papps considered that IPPs need to wait for the information to come out of AEMO and then respond to that information. Mr Stephens noted that the information on the BMO is provided at the start of every half-hour. At one-minute past the half hour Synergy must make their submission, AEMO's system processes Synergy's submission, and then IPPs can see the result and decide if they must change their submission and make their submission.

Mr Eliot questioned whether it was a long period between when Synergy makes its submission and when the BMO is in IPP's hands and considered that if it was an automated process it would take less than a minute. Ms Papps noted that if the BMO comes out at 8.01 then IPPs would not want to have to make a submission before 8:30. Ms Papps considered that 30 minutes was too short. Mr Stephens noted that if the IPP makes its Balancing Submission within the last two minutes before the start of interval, it is not reflected in the BMO for the following interval, only in the next one.

Mr Maticka noted the design of the market was to allow IPPs to respond to the market dominance of Synergy and considered that, from a technical point of view, it makes no difference to the power system. Mr Maticka posed the question of whether it is a correct lever for addressing market power.

Ms Laidlaw considered that one of the IPP's biggest risks is infeasible dispatch, and that this risk increases if they do not have some forewarning of what the Balancing Portfolio is doing. The Balancing Portfolio doesn't have the same kind of risk of infeasible dispatch. However, Mr Huppatz considered that Synergy also face infeasible dispatch because of the forecasting inaccuracy, and the long gate closure.

Ms Varma noted that the intent in the planned reform is that the Synergy Balancing Portfolio will no longer exist, which creates opportunities to harmonise the gate closure of Synergy and IPPs, if there is a gate closure.

Ms Robins questioned whether anyone had any concerns or could see issues with Synergy having a rolling gate closure instead of block bidding, as this would reduce the time frame of operation between the last forecast and the bid for the start of the Trading Interval.

Mr Huppatz considered that the shorter the gate closure, the better in terms of efficiency for the market. Increasingly, Synergy needs to have the ability to get its plant in or out. This might

mean making a decommitment decision but if that is left too late, Synergy might be able to de-commit the plant but it's too late to bid it out, so that volume stays in the market. Similarly, Synergy have some slow start plants, which is problematic if they must come on at short notice. For example, if AEMO wanted to request that Coburn comes on because of a security issue, it cannot provide that volume because it needs to start early in the day to be on that night. Mr Huppatz considered that the shorter the gate closure, the more accurately Synergy can reflect what is required, which is efficient for the market. On that basis, Mr Huppatz indicated that Synergy advocates for a rolling gate closure.

Ms Ng noted that when the rules were developed, the block bidding and time frames were developed just to manage market power issues. Ms Ng questioned whether everyone was comfortable that the market power issues had disappeared, before going down the path of introducing a rolling gate closure for Synergy. Ms Ng considered that everyone needs to be comfortable with the change, given that there is a new world that the market is going to that will have facility bidding and potentially 30-minute gate closure, with everyone on the same time frames.

Ms Laidlaw questioned how block bidding mitigates market power, noting that there is no difference for the first trading interval in the block, but there is a half-hour delay for the second interval. Ms Laidlaw questioned what the purpose of that delay is and how it mitigates market power. Mr Maticka recalled that the idea of the design was to provide a mechanism to encourage Synergy to pull facilities out of the Balancing Portfolio. Mr Peake considered that there was also a reluctance to make the changes too big from the word go. Mr Maticka considered further that there could have been another reason to do with resource plans but that it was an outdated concept, and that Ms Ng's point was correct, that block bidding should not just be removed without checking whether some of the logic around it is still valid.

Mr Huppatz added that the market has changed and that there is inefficiency and additional risk to the market by Synergy not going to a rolling gate closure. Mr Huppatz questioned the logic of a requirement that by 10:00 AM, Synergy cannot adjust what it is going to do or provide a signal to the market for what Synergy is doing over the evening peak. Mr Huppatz considered that this is unworkable

Mr Maticka considered that if Synergy is sitting at a mid-low point, it would end up having to decommit some coal and then it might have to bring it back on very quickly, within a half an hour or an hour. Mr Maticka considered that this could present some

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	<p>horrendous problems for the management of the fleet and that Synergy cannot respond if it has such forward blocks.</p> <p>Mr Huppatz added that Synergy can manage base load plant with a fixed gate closure but as soon as it starts becoming mid-merit, trying to manage with a block that is 10 hours in advance is not ideal.</p> <p>Mr Eliot noted that RCP support was looking for feedback from everybody on the following questions:</p> <ol style="list-style-type: none"> 1. whether there are any concerns with a rolling gate closure for Synergy; 2. if there is a reason why Synergy should have a longer BGC than everybody else; and 3. if the answer to number two, is yes, how much time do IPPs need and why? <p>Action MAC Members to provide feedback to the Panel on the above questions.</p>	<p>MAC Members</p>
<p>17-19</p>	<p>Issue 3: Load Following Gate Closure, Current Gate Closure Timeframes and Strawman Options</p> <p>Ms Robins noted that she would ask participants the same questions about the LFAS gate closure as for Synergy's gate closure.</p> <p>Regarding the strawman options, a possible reduction in the LFAS blocks from six to four hours was suggested, due to Market Participant concerns that a rolling gate closure may necessitate employing another trader, and that it could increase the risk of penalties if Participants do not realise that they have been cleared to provide LFAS and do not reposition themselves in the balancing market.</p> <p>Mr Fairclough questioned whether a change to the LFAS gate closure was within the scope of this Rule Change. Ms Robins considered that it is within scope, as it is about creating efficiencies through increased forecasting accuracy.</p>	
	<p>Next Steps</p> <p>RCP Support will send an email with the date for a follow up workshop, and with follow up questions to address the Action Items for response within two weeks.</p>	