Minutes

Meeting Title:	RC_2017_02 Implementation of 30-minute Balancing Gate Closure Workshop
Date:	18 October 2019
Time:	10:00 AM – 12:00 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)	
Dean Sharafi	AEMO	
John Nguyen	Perth Energy	Conference call
Martin Maticka	AEMO	
Brad Huppatz	Synergy	
Quentin Jeay	Kleenheat	
Paul Arias	Bluewaters Power	
Tim McLeod	Amanda Energy	
Sam Lei	Alinta Energy	
Erin Stone	Perth Energy	

Item	Subject	Action

1 **Welcome**

The Chair opened the meeting at 10:00 AM and welcomed those in attendance.

2 **Apologies/Attendance**

The Chair noted the attendance as listed above.

Item	Subject	Action
3	**Minutes of 6 September 2019 Workshop regarding RC_2017_02: Implementation of 30-minute Balancing Gate Closure**	

The Chair noted that the minutes from the workshop on 6 September 2019 (the first workshop) had been distributed to workshop attendees on 25 September 2019 and that two comments had been received.

The revised minutes were tabled at the Market Advisory Committee (**MAC**) meeting on 15 October 2019. The MAC noted the minutes and had no further comments.

Attendees had no further comments on the minutes from the first workshop.

Item	Subject	Action
4	**RC_2017_02 Workshop**	

Ms Natalie Robins led discussion for the workshop.

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3-4	**Review of First Workshop Discussions**	
	Ms Robins noted that the main outcome of the first workshop was the introduction of AEMO's new perspective on the use of LFAS only to address uninstructed fluctuations in output (such as from wind and solar), not instructed fluctuations from the ramping of Scheduled Generators. Up until now LFAS has been and is still being used to address fluctuations from the ramping of Scheduled Generators.	
	AEMO considered that, at a 60-minute Balancing Gate Closure (**BGC**), its only option to address the aggregate ramp issue is to displace Synergy's Balancing Portfolio to offset the aggregate ramp of Independent Power Producers (**IPPs**). Automated linear ramping will be required where the forecast ramp of the Balancing Portfolio is less than the aggregate ramp of IPPs.	
	Whilst there is no definition around how the linear ramping process will work, there will be cost and time implications associated with automation of this process. Additionally, given that there is a market reform program underway, any changes that are made to implement a linear ramping process will need to be made to fit on top of the existing system rather than making wholesale changes to the system.	

Ms Robins noted that in the first workshop, AEMO identified three options for responding to aggregate non-Synergy scheduled movements in a Normal Operating State, which were to:

(1) displace the Balancing Portfolio to offset it, if it is in the Trading Interval and the Balancing Portfolio is available to move within the Trading Interval;

(2) dispatch the Balancing Portfolio in advance of the Trading Interval to reduce the impact and duration of use of LFAS Facilities; and

(3) constrain non-Synergy Facilities.

AEMO had considered at the first workshop that option (2) was not feasible, and since then has also discounted the use of option (3). In explanation, Mr Matthew Fairclough reasoned that issuing Dispatch Instructions to non-Synergy Facilities that are causing the aggregate ramp issue (option 3) is effectively linear dispatch. Mr Fairclough explained that, instead of issuing a Dispatch Instruction at the ramp rate that the participant put in their Balancing Submission, AEMO will come up with a different ramp rate, whilst keeping the quantity in the Dispatch Instruction the same.

Ms Jenny Laidlaw questioned whether the option to hold one of the generators back for some period had also been discounted.
Mr Fairclough confirmed that this option was no longer a consideration and had not been investigated further. Mr Fairclough considered that the biggest issue with staggered ramping is that the delayed Facility will not meet the quantity requested in its Balancing Submission. This is effectively dispatch out of merit, which can only be done to avoid a High Risk Operating State under the rules.

Ms Robins questioned whether this interpretation was correct. If the network is in a Normal Operating State and there is a potential to enter a High Risk Operating State, the intention is for AEMO to take steps to avoid the High Risk Operating State before it occurs.

Mr Fairclough considered that there is a conflict because the Market Rules require that out of merit dispatch can only be used to avoid a High Risk Operating State, and if AEMO get into that situation because of an action that they take in the first instance, they are precluded from using it.

Mr Dean Sharafi clarified that a High Risk Operating State is linked to the physical state of the grid and the risk associated with it, and should not be the result of participant bidding behaviour.

Mr Paul Arias considered that options that require a tweak to the Market Rules should not be excluded. Mr Fairclough warned that while any rules can be amended, it may produce unforeseen outcomes and that AEMO would be reluctant to further consider such an amendment.

Mr Brad Huppatz considered that the alternate solution was to move the Balancing Portfolio out of merit within the interval to accommodate instructed outputs, which was inconsistent with

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	Synergy's Balancing Portfolio clearing volumes. Mr Huppatz considered that applying an output variance to the Balancing Portfolio to accommodate the instructed output variance did not seem to be consistent with the Wholesale Market Objectives.	
	Ms Robins noted that there was inconsistency in the arguments being put forward because, in the case of linear ramping, it was suggested that constraining Market Participants was okay but, in the case of staggered ramping, it was not an option. It was agreed that this discussion should be continued off-line later.	
	Ms Robins noted that AEMO's position on a 90-minute BGC at the last workshop was that it would use the Balancing Portfolio to offset the aggregate ramp of IPPs but that it would not have to be done automatically and could be done manually. This would mean fewer cost and time implications, although Market Participants would still need to adjust their systems to allow for linear ramping.	
	Additionally, AEMO would have the ability to dispatch Synergy's units ahead of the Trading Interval. For example, Synergy's coal plant could be ramped down ahead of the Trading Interval to allow gas plant to position itself so that it can ramp down rapidly at the start of the Trading Interval to offset the aggregate ramp up of IPPs. However, as Synergy indicated in the first workshop, this option is quickly being eroded, as Synergy is increasingly operating at its minimum generation and does not have room to ramp down further.	
5	**New System Management Analysis**	
	Ms Robins noted that since the first workshop, AEMO had been working on determining how frequently the aggregate ramp of IPPs will be an issue, requiring linear dispatch. AEMO had developed a formula to predict when linear dispatch is required and applied it to 2018/19 to determine that linear ramping would be required in about 10% of Trading Intervals (about five times per day) at a 60-minute BGC, and in about 7% of Trading Intervals (about three times per day) at a 90-minute BGC.	
	Ms Robins cautioned however, that AEMO had considered an extreme scenario in which LFAS cannot be used to address the aggregate ramp issue so the only option that it would have is to displace the Balancing Portfolio to offset the aggregate ramp issue.	
	Mr Fairclough considered that the findings for the 90-minute BGC option were the same for a two-hour BGC, and that the added half an hour didn't really make that much of a difference as far as determining what AEMO can do in advance.	
	Ms Laidlaw questioned whether, to stop using LFAS, AEMO's plan was to use linear ramping in the 7% of Trading Intervals that the aggregate ramp issue occurs in. Mr Fairclough considered that if the market is not going to a 60-minute BGC, there are 7% of intervals where the Balancing Portfolio's ability to offset all other movements are exceeded, but because it has a bit more time and more options,	

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	things do not need to be automated and can be dealt with manually. Mr Fairclough considered that this may change at some point in the future but AEMO can deal with it right now as it is.	
	Ms Laidlaw questioned whether AEMO intends then to go to linear ramping on a manual basis as soon as it can. Mr Fairclough considered that AEMO is not intending to introduce manual linear ramping immediately. Mr Fairclough explained that, if the gate closure is more than 60 minutes, AEMO will assess when it gets to a point when it must implement linear ramping.	
	Ms Laidlaw pointed out that the aggregate ramping issue is happening now in 7% of intervals. Mr Sharafi clarified that going to a 90-minute BGC is not going to change the process by which AEMO dispatches. Ms Laidlaw questioned whether it would matter if AEMO was eating into the LFAS quantities in this situation. Mr Sharafi considered that LFAS is currently being used to enable aggregate ramping of generators and the situation would remain the same.	
	Mr Arias questioned whether AEMO had outlined a view at the start of the workshop that it should not be using LFAS, as it was risking system security. Mr Sharafi noted that it is his view that AEMO should only use LFAS when it does not have any other choice. At the start of the interval, AEMO depletes some level of LFAS because that is the reality of dispatch.	
	Ms Laidlaw noted that the incidence of the aggregate ramp issue seems very high at 7% and asked whether there are problems in the system due to volatility such that AEMO is not able to risk using LFAS. Ms Laidlaw questioned why the risk materialises and must be acted on for the extra 3% at the 60-minute BGC and not at the 90-minute BGC.	
	Mr Fairclough considered that saying there is a 3% difference doesn't capture all aspects of the issue. Mr Fairclough handed out a series of slides and asked attendees to consider the table in the final slide, representing the results of the back-casting analysis on the 2018/19 data. Mr Fairclough explained that AEMO:	
	• only has what the Balancing Portfolio can move in the 60-minute BGC scenario; and	
	• can dispatch more in advance in the 90-minute scenario.	
	Mr Fairclough considered the 3% difference between the two scenarios in terms of the Trading Intervals when the aggregate ramp issue occurs requires that 20% of the energy would be constrained, which is reasonably significant. At a 60-minute BGC the issue occurs in 10% of the intervals, which is too much to rely on LFAS Facilities. Effectively, at a 60-minute BGC the impost is too much for AEMO to determine which Trading Intervals would be manageable, so a blanket cut-off would be employed such that LFAS could not be used any time the threshold is exceeded.	

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6	**Scope of the Rule Change Proposal**	
	Ms Robins noted that RCP Support had received legal advice that LFAS Gate Closure could be amended under the current Rule Change Proposal.	
	However, RCP Support had also received advice that the Rule Change Proposal is about 'accuracy of information' and that amendments to the Market Rules are not within scope if they are not about this topic, such as the introduction of staggered or linear ramping. Ms Robins considered however, that this did not provide a barrier to moving to a 60 or 90-minute BGC, as AEMO had indicated that it could implement linear ramping without changes to the Market Rules.	
	There was some discussion on whether amendments to Synergy's gate closure were within the scope of the Rule Change Proposal and it was agreed that this is within scope.	
7	**Benefits and Costs of the Options**	
	Ms Robins noted that shorter BGCs lead to greater accuracy of information, and lesser risk to Market Participants due to changing circumstances. However, there are costs for both AEMO and Market Participants due to the requirement for automated linear ramping at the 60-minute BGC, which is essentially a short-term solution to the aggregate ramp issue until the market reforms come into place. Consideration also needs to be given to the fact that AEMO cannot begin to look at making changes to its systems until mid-2020.	
	Mr Sam Lei questioned whether linear ramping is going to be implemented even if the BGC is not changed. Mr Fairclough considered that at present AEMO is not expecting to need to implement linear ramping soon, but it will have to reassess this next year. Mr Lei noted that Alinta has significant concerns about its machines, which are tuned to a certain ramp rate and will be very unstable if they are required to ramp at different ramp rates, and there will be a risk of them tripping more often.	
	Ms Laidlaw questioned whether, before AEMO decides to move to linear ramping under any circumstances, as opposed to putting on more LFAS or using other options (such as constraining people off occasionally), AEMO had looked at the overall costs and benefits, including the costs of generators upgrades and constrained on and off payments.	
	Mr Fairclough confirmed that AEMO would consider all these issues before it introduced linear ramping. However, the information that it provided in the slides was a starting point on how it can survive a move to a 60-minute BGC. Mr Fairclough considered that the costs include constrained on and off payments and loss of energy for generators, and if there are generators that need to modify their	

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	facilities to comply with the existing Market Rules, then that would have to be considered as well.	
	Ms Laidlaw noted that at the last workshop AEMO indicated that it was going to implement linear ramping and the question was whether it would have to be automated or not. Mr Fairclough confirmed this but suggested that the point was that AEMO may need to get to it at some stage, but it has not foreseen a need to introduce it yet.	
	Mr Huppatz questioned whether AEMO's adopted interpretation, that LFAS can only be used for uninstructed fluctuations, meant that AEMO would have to apply linear ramping in the 7% of cases where the aggregate ramping issue occurs now. Mr Fairclough explained that with that definition of LFAS the requirement does not change and AEMO is bearing the risk of eating into the available LFAS. Mr Sharafi confirmed this perspective, noting that at the beginning of the Trading Interval, AEMO eats into the LFAS but, as you move forward into the Trading Interval, the risk becomes smaller and smaller.	
	Mr Arias questioned whether, if AEMO is already using LFAS, and even though it has mentioned that it is not supposed to be using it, AEMO has considered using and enabling more LFAS, and not moving to linear ramping. Mr Sharafi confirmed that this was a consideration. Mr Arias questioned further whether consideration had been given to whether automatic linear ramping was lower cost or getting more LFAS per Trading Interval was lower cost.	
	Mr Fairclough explained that the issue is that the definition of LFAS does not include instructed changes. Mr Arias considered that AEMO is already eating into the LFAS to address instructed fluctuations, regardless of how LFAS is specified. Mr Fairclough argued that this was not the case, and that AEMO had set its requirement ignoring instructed changes. Mr Fairclough explained that AEMO was eating into that requirement at certain times and the question was about how often we can live with that risk.	
	Ms Laidlaw questioned whether the Market Rules were necessarily the sticking point, considering that AEMO had technically not previously been setting the requirement according to the Market Rules, as it would not have provided enough LFAS for the system. Ms Laidlaw cautioned however, that putting on additional LFAS may be a high cost option, particularly if the SWIS starts to run out of generation. Mr Fairclough considered that AEMO did not necessarily share this position.	
	Mr Arias drew attention to a comparison of the costs associated with 90-minute BGC and the current 120-minute gate closure and questioned whether a lot of the costs associated with the 90-minute BGC would already be in the 120-minute BGC. Mr Fairclough confirmed that the difference between the 90- and 120-minute	

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	BGCs would be zero. Mr Arias considered that, on this basis, the starting point is a 90-minute BGC.	
	Ms Laidlaw questioned whether AEMO had done any more work on how the manual linear ramping process would work and how at 90 or 60 minutes out, AEMO would determine what it needed to do and how it would change the ramp rates to linear ramp rates in the Real Time Dispatch Engine (**RTDE**). Mr Fairclough noted that whilst it had not done any more work in this area, there was an existing manual process that allowed it to override the ramp rates.	
	Ms Laidlaw questioned how AEMO would work out the ramp rates for each generator and load them into the RTDE in time for each dispatch cycle. Mr Fairclough considered that AEMO would go through the same process that it used to work out when the linear ramping Trading Interval would occur, and at that point everyone's quantities would be divided by the time, and that would produce the linear ramping rates.	
	Ms Laidlaw questioned the practicality of this approach, given the timing requirements and that changes in demand and dispatch can occur within the ten-minute dispatch cycle, and asked at what stage AEMO would work out the dispatch requirements and input the ramp rates. Mr Sharafi considered that this was the controller's decision, based on their consideration of the conditions and determining what ramp rate each generator needs to get to the point that they need to be at.	
	Ms Laidlaw considered that the controller may need to override the ramp rate of only one or two generators rather than everyone and questioned whether it would be necessary to switch everyone over to linear ramping, which is quite involved. Mr Sharafi noted that AEMO has not done this yet, so it has not yet determined its process.	
	Mr Fairclough considered that the problem is that it's more difficult to do the calculation to pick a winner than just to say that, unfortunately, everyone loses, and if AEMO did pick winners, it would have to have a process for determining who would be the winner, which would be quite challenging.	
	Ms Robins questioned whether AEMO has previously used linear ramping. Mr Fairclough noted that every now and again it had had to vary the ramp rates of Facilities, but not on a regular basis, and it was usually only for one or two Facilities.	
	Mr Huppatz considered that AEMO routinely move the Balancing Portfolio outside of its clearing volumes to accommodate the ramping issue. Mr Fairclough considered that AEMO moves the Balancing Portfolio to ensure power system security.	
	Ms Robins questioned how AEMO determined who is causing the aggregate ramp issue. Mr Fairclough explained that most of the time AEMO deals with the aggregate ramp issue by dispatching the	

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	Balancing Portfolio in advance, so that whoever is causing the aggregate ramp issue can do what it wants. Where that is not possible, AEMO absorbs the impost on LFAS machines. However, in some cases, there are Facilities with very high ramp rates that are ramping in different ways, but they are generally the only generators ramping when this occurs, so AEMO modifies the ramp rates of those Facilities. Mr Fairclough clarified that AEMO has not been in a situation yet where five other machines are also ramping.	
	Ms Laidlaw questioned whether an automated linear ramping process would assume that the Balancing Portfolio was being dispatched at 15 MW/minute or whether this does not matter. Mr Fairclough considered that it does not matter, as the quantities remain the same and it's just the ramp to get there that matters. If there was an aggregate ramp issue that could not be offset by the Balancing Portfolio and linear ramping was necessary, then every Facility would be dispatched linearly, this would be aggregated, and the Balancing Portfolio would ramp accordingly to offset the aggregate ramp. The ramp that the Balancing Portfolio must deal with will always be set using a manual process and not using LFAS.	
	Ms Laidlaw questioned whether the Balancing Portfolio would be dispatched to a specific target, and if not, how AEMO would work out where to send the Balancing Portfolio if it was not using LFAS. Mr Fairclough considered that AEMO would not dispatch the Balancing Portfolio to a specific target but would move the Balancing Portfolio around during the Trading Interval to offset whatever remaining aggregate ramp existed. Mr Fairclough said it was not clear how it would be determined where to send the Balancing Portfolio but considered that controllers are trained to work this out.	
	Mr Lei noted that the main benefit of a reduced gate closure is better forecasts and questioned whether a lot of benefits could be realised if just Synergy's gate closure was reduced without having all the cost associated with other changes to the BGC. Mr Lei considered that this would give Synergy time to consider more accurate information, as right now, they are locked out far ahead of time.	
8	**Quantifying Effects of Change** Ms Robins noted that there are three ways that the effects of the Rule Change Proposal could be assessed: estimation, market model simulation and time series forecasting. Time series forecasting is not really an option given that it requires looking backwards at what the outcome of the intervention was in the market. The main methods employed in the literature are estimation and market model simulation but there are problems with both, with the accuracy of the outputs being only as good as the accuracy of the	

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	inputs. With estimation, RCP Support would have to ask affected Market Participants and AEMO to approximate the possible effects of the intervention on themselves, but this approach is prone to bias. With market model simulation, the operation of the market can be simulated to assess outcomes at the various BGCs, but the Wholesale Electricity Market (**WEM**) uses a Balancing Portfolio and simulations are run on a facility basis, which reduces the accuracy of the outcomes. Market model simulation is also a costly and time-consuming process and the fact that resources are already being diverted into the Energy Transformation Strategy (**ETS**) reforms needs to be considered.	
9	**Forecasting Accuracy** Ms Robins noted that the main challenge in assessing the effects of changes to the BGC is dealing with the variability of supply (which depends on the available generation mix) and demand (which is increasingly fluctuating with an increasing penetration of solar PV), and the combined effect of these impacts on price, which is non-linear. Trying to predict how Market Participants will behave (i.e. whether they will position themselves at the floor so that they must run or position themselves at the ceiling rather than running at a lower clearing price) is also difficult. Ms Robins also highlighted that changes to the market would be made through the ETS reforms within the next two years, but any changes to implement new systems (such as an automatic linear ramping process) could not be made until the end of 2020.	
10-11	**Intended Approach** Ms Robins noted that RCP Support's intended approach is therefore not to use the production cost market model simulation or to attempt to predict what Market Participants might do in certain scenarios. Instead, its assessment will be based on Market Participant feedback from MAC meetings, workshops and the first period submissions. RCP Support will assess the proposal against the Wholesale and Balancing Market Objectives and the principles that underlie these objectives, and wherever possible will provide quantitative analyses to support its conclusions. Mr Fairclough considered that a dollar value for the costs associated with the Rule Change Proposal can be estimated but market simulation will be required to provide a dollar value estimate of the benefits from improved forecast accuracy. RCP Support agreed with Mr Fairclough, noting that this was the challenge that it was up against and questioned whether attendees had any suggestions for how the benefits of the Rule Change Proposal could be measured. No suggestions were put forward.	

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12	**Enhancement of Information used in Trading Decisions**	
	Mr Sharafi noted that a major initiative to increase the accuracy of forecasting was to enable Non-Scheduled Generators to update their forecasts after BGC. Mr Sharafi questioned whether generators had made use of this initiative and noted that there are many things that can be done to increase the accuracy of the forecasts that are not currently being done.	
	Ms Laidlaw noted that generators have not made use of this initiative and considered that an updated forecast after BGC serves little purpose in terms of accuracy in bidding, as Market Participants cannot update their Balancing Submissions after BGC. However, Ms Laidlaw considered that the updated forecast would give Market Participants a better indication of whether they are about to be started up, which is useful from an operational standpoint.	
	Ms Laidlaw noted that a further option that may be useful operationally is to publish what is effectively the persistence forecast (i.e. the current output of Non-Scheduled Generators) closer to real time to allow Market Participants to take that into account when they look at the Forecast Balancing Merit Order (**BMO**) and see how much its likely to be affected. Ms Laidlaw considered that, at a certain stage, the persistence forecast is likely to be better than any forecast that a Market Participant is likely to get from Balancing Submissions.	
	Mr Paul Arias noted that AEMO is updating forecasts more frequently now and suggested another option to increase the accuracy of information available to Market Participants would be for AEMO to re-run and publish the Forecast BMO every 5 minutes. Mr Arias considered that five or six IPPs may change their position slightly in a half hour period, and if one of the IPPs is marginal, a Market Participant may get caught out due to sudden changes in price (e.g. the price could suddenly double or halve).	
Extra Slide	**Implications of a Rolling Synergy Gate Closure for a Rolling LFAS Gate Closure**	
	Ms Robins noted that, in the first workshop, there was general support for moving Synergy to a rolling gate closure and that an implication of moving Synergy to a rolling gate closure was that traders would need to monitor the Forecast BMO on a 24/7 basis to alleviate any risk of infeasible dispatch.	
	However, when the possibility of moving the LFAS Gate Closure to a rolling gate closure was discussed, one of the Market Participants' concerns was that they may have to employ an additional trader because this would require 24/7 monitoring of the market. Additionally, Market Participants were concerned that there would be an increased risk that they would not realise that they had cleared in the LFAS Market, and therefore not reposition themselves accordingly in the Balancing Market, leading to penalties. Ms Robins	

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	questioned whether, if there was a trader already monitoring the Balancing Market because of a Synergy rolling gate closure, there was an option to also move to a rolling gate closure for the LFAS Market.	
	Mr Lei considered that LFAS and Balancing monitoring are quite different because if you are enabled for LFAS you must make a second submission to reflect your enablement, whilst everyone has a standing submission to react in the Balancing Market so if Synergy changes its Balancing Submission the validity of everyone's Balancing Submissions are not affected, and Market Participants are not obliged to submit another Balancing Submission.	
	Ms Laidlaw questioned how often participants in the LFAS Market have to change their Balancing Submissions following LFAS Gate Closure. Mr Arias considered that changes to the Balancing Submissions had to occur as soon as the participant knows that they are enabled and, if participants have a standing submission, then that would need to be tweaked three times a day or more, based on the mix and how much is enabled.	
	Mr Huppatz considered that there are quite different drivers for LFAS and offered that participants have to see what is clearing in the market, which can change up to gate closure, so participants have to check that their Balancing Submissions have sufficient LFAS at the cap and floor pricing, to meet the obligation. Then, if you bid at the floor, the risk is that you are capped at the floor and it is not an economic run if you get put on.	
	Mr Arias agreed, noting that with Balancing, if you are committed, you will guarantee a run level and price things so that if something is changed (e.g. someone else comes out) you can go either higher or lower in price. It is LFAS that leads to the obligation to then change bids in the Balancing Market. A rolling gate closure for Synergy doesn't necessarily require a review every half an hour, whereas if you go to a rolling LFAS Gate Closure, and you are participating or planning on bidding into that market, you will have to review it every half an hour because of the potential for non-compliance issues. Mr Arias considered that block bidding for LFAS was still the preferred option.	
	In response to a question on whether a two-hour LFAS Horizon (instead of 6 or 4-hour blocks) would introduce too much risk, Mr Arias considered that the risk would be too great not to have a trader on duty.	
	Ms Laidlaw questioned whether the LFAS Merit Order sometimes changes a participant's fundamental dispatch. Mr Arias considered that it can sometimes change the minimum commitment levels, as there are no guarantees on how much will be cleared in LFAS, if	

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	you clear at all. Mr Arias noted that not all machines can provide LFAS for their entire operational range. Ms Laidlaw questioned how often the results of the LFAS Market surprise Market Participants. Mr Arias responded that there are certain periods that may surprise you, and others which may be the same for weeks on end, but you would never run the risk of not checking. Mr Lei agreed, noting that the risk would be too high.	
13	**Next Steps** Ms Robins noted that the next steps will be to: • follow up on any outstanding data requests and complete any analyses (including establishing the requirement for linear ramping); • follow up on views expressed in workshops and conduct any one on one interviews requested by Market Participants; and • put the Draft Rule Change Report together as quickly as possible. The Chair asked whether attendees had any final questions or comments before wrapping up the workshop. Mr Huppatz offered that consideration needs to be given to linear ramping because of where the loads and dispatch are heading. Mr Huppatz considered that some form of linear ramping will be needed to ensure system security and that this probably informs the cost benefit analysis that RCP Support will undertake. Mr Quentin Jeay agreed and considered that it is better for the customer who pays for the cost of energy. Ms Robins cautioned that any linear ramping introduced prior to the ETS reforms would have to be devised, designed and implemented to fit on top of the existing system, and that, at this point, we don't have a good understanding of how linear ramping might work in practice in the existing system. Ms Robins noted that consideration also needs to be given to the question of whether removing the use of LFAS to address the aggregate ramp issue is reasonable given the need to maintain system security and reliability prior to the reforms. Mr Huppatz suggested that the LFAS enablement may be one of the considerations in a cost benefit analysis (i.e. you either go for linear ramping to manage system security or you review how much LFAS is enabled or utilised). Ms Robins noted that the suggestion that LFAS could not be used for instructed fluctuations had come from AEMO and that it was beyond the scope of RC_2017_02, which is about forecast accuracy. Mr Lei noted also that the introduction of linear ramping slated for the ETS reforms was based on a 5-minute dispatch cycle rather than the current ten-minute cycle, and that this would solve a lot of the aggregate ramping issue. Mr Lei questioned whether this	

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	process is just about solving the issues until the ETS reforms kick in, and it was agreed that this was the case. Ms Laidlaw highlighted the issues over the weekend of 12-13 October 2019, in which the WEM had too much generation and the Balancing Price went to the floor. Ms Laidlaw noted that in that situation, rooftop solar cannot be turned down, so generation must be turned down instead. Ms Laidlaw considered that the RTDE has a large dependency on the Balancing Portfolio and that there is a blurring between Balancing and LFAS, and questioned how AEMO will find the ramp necessary to offset the aggregate ramp of IPPs when it has to turn generation down in that scenario. Ms Laidlaw considered that these issues are far more urgent now and will probably have to be addressed before 2022, but are out of scope of RC_2017_02.	