Government of Western Australia
Energy Policy WA

Minutes

WEM Reform Implementation Group – Meeting 5

Time: 9:30am – 12:00pm
Date: 1 October 2020
Venue: Teleconference

Attendees:

Name	Organisation	Name	Organisation
Alan		Laura Koziol	RCP
Arthur Panggabean	AEMO	Leon Kwek	AEMO
Ayan Ghosal	Western Power	Liz Aitken	
Aden Barker	ETIU	Lynda Venables	Synergy
Aditi Varma	ETIU	Mark McKinnon	Western Power
Adrian Theseira	ERA	Mark Riley	AGL
Ashwin Raj	ETIU	Michael Zammit	VIOTAS Australia
Ben Brealey	AEMO	Mike Hales	AEMO
Brad Huppatz	Synergy	Oscar Carlberg	Alinta
Chris Wilson	AEMO	Patrick Peake	Perth Energy
Dean Frost	Western Power	Paul Arias	NewGen
Dimitri Lorenzo	NewGen	Rebecca White	ETIU
Eliana Zurhaar		Rob Perkovic	Alinta
Elizabeth Walters	ERA	Robert Pullella	ERA
Erin Stone	Point Global	Peter Huxtable	Water Corporation
Graham Pearson	Australian Energy Council	Rhiannon Bedola	Synergy
Glen Carruthers	Western Power	Richard Peppler	Western Power
Harry Street	Entego Advisory	Ross Davies	Western Power
Huuson Nguyen	Western Power	Simon Middleton	AEMO
Jenny Laidlaw	RCP	Steven Kane	ETIU
Jo Pownall		Stuart Featham	AEMO
Josephine Nga	AEMO	Toby Price	AEMO
Judy Hunter	Western Power	Victor Francisco	Power System Consultants
Kaye Anderson	AEMO	Wendy Ng	ERM Power
Kei Sukmadjaja	Western Power		

Item No.	Issue
5	• Ben Brearley (BB) provided an update on AEMO implementation activities (see slide). ○ The immediate actions for AEMO are as outlined on the slide.

7 and 8	• Aden Barker (AB) presented on the rule drafting timeline (see slide).
	• The tranche naming has been amended. This is in part in response to stakeholder requests to see the (former) tranche one amending rules (released in July) alongside the amending rules to be released in mid-October.
	• New Tranche 1 (Generator Performance Standards (GPS), administrative package, frequency operation standards and contingency events) will be released next week for a week of final exposure prior to being provided to the Minister for Energy for making. These rules, including those relating to GPS, need to be made as soon as possible given obligations are to commence on 1 February 2021.
	  ○ The administrative package includes minor drafting changes, including replacing references to System Management with AEMO, replacing Market Rules with WEM rules, replacing Market Website with WEM Website and naming all procedures as WEM Procedures.
	• Tranche 2 – incorporating parts of former tranche 1 – will be released for stakeholder comment in the week of 19 October for a four-week consultation period. There will be no second round of exposure given the timelines that are necessary to ensure the Minister is able to make the amending rules in late November/early December 2020. AB requested stakeholders provide submissions as early as possible, which can be in the form of formal submissions, emails, phone calls or meetings.
	• Tranche 3 is planned to be released at the same time as tranche 2, although will be in a separate document given the high volume of changes across the workstreams. Tranche 3 amending rules will be provided to the Minister for making at the same time as the Tranche 2 amending rules.
	• AB said stakeholders were previously advised that another non-reform rule change relating to North Country would be consulted on at the same time as the tranche 2 and 2 amending rules. Given there are policy matters that require further consideration the North Country rule change will be separately consulted on in early 2021.
	• The timing for tranches 4 and 5 is unchanged (see slide).
	• Jenny Laidlaw (JL) and Oscar Carlberg (OC) asked when will be released.
	  ○ AB said the week of 19 October at the same time as tranche 2, however the two tranches will be released in separate documents.
	• Rhiannon Bedola (RB) said that tranche 2 and 3 are both very large packages.
	  ○ AB said the bulk of the content has already been consulted on and is only being released again to inform stakeholders how their feedback has been responded to.
	  ○ AB acknowledged is a lot to get through over a four-week period. These timeframes are necessary to ensure the Minister is in a position to make rules prior to the end of the calendar year to provide AEMO certainty to develop its market systems and also provide stakeholders with greater certainty on the new rules.
	  ○ AB advised there will be five TDOWGs during the consultation period. ETIU will endeavour to send the slides prior to the sessions. The sessions will have the same format as the tranche 1 TDOWGs, including providing an overview of new clauses and key changes.

9	• Stuart Featham (SF) provided a recap on what is being included in the JIP (see slide).

10	• SF said there have been minor updates to the JIP this month. • Over October AEMO will include detail on the milestones for other participants in the JIP. It will also develop a milestone log including more detailed information on each milestone, and a change log to track where things have been added or removed.

12	• SF provided a recap a recap on the approach to develop and consult on procedures.
	  ○ Box 1 procedures must be developed quickly as the rule obligations commence earlier. For this reason there will be a single phase of development.
	  ○ Box 2 procedures will be developed over a longer period, which allows for a phased approach. The first phase will be high-level principles, followed by more detailed drafting.
	• ETIU will work with the procedure owners – AEMO, Western Power and the ERA – to develop the target dates for consultation.
	• The procedures are developed by the procedure owners. Please provide feedback directly to the relevant organisation.
	• The window for consultation is not a fixed time period, rather it will be determined by the complexity and nature of the content and document size. The minimum time will be two weeks, but it will likely be four weeks or greater.
	• The procedures being presented on at this meeting will be open for four weeks consultation period following them being circulated to stakeholders with the WRIG minutes next week.
	• SF asked stakeholders to advise if they would like sessions covering more detailed content of the procedures.
	• The procedures can be amended if necessary following additional rules being finalised or to address implementation issues. Stakeholders will have the opportunity to comment on any additional amendments.

13	• SF outlined the target dates for consultation on AEMO procedures to end of 2020 (see slide). • AEMO is on track to provide some WEMDE content at the 29 October WRIG meeting. • AEMO will provide stakeholders with any updates to timeline as they arise.
15	• AB outlined the next steps for the JIP (see slide).
ESS Accreditation – Toby Price (AEMO)	
3	• Toby Price (TP) outlined there would be an interim approach to accredit facilities to Frequency Co-optimised Essential System Services (FCESS) to ensure sufficient accreditation prior at Market Start.
4	• TP provided a recap of the future FCESS (see slide).
5	• TP said that facilities currently accredited for the Load Following Ancillary Service (LFAS) will be accredited for the Regulation Raise and Regulation Lower FCESS. • AEMO needs to further consider what the minimum effective quantity is to determine the minimum offerable quantity and therefore the minimum accredited capability. • AEMO will seek to accredit to a maximum capability, capped at the maximum ramp rate over five minutes. • AEMO expects it can accredit existing accredited facilities using existing standing data or AGC set points to limit the additional information to be provided by Market Participants.

6	• TP provided an example of a Regulation trapezium (see slide). • Market Participants will be expected to structure their bids to reflect their applicable trapezium (e.g. to reflect fuel type, plant configuration).
7	• TP said that AEMO will be seeking all facilities currently accredited for the Spinning Reserve Ancillary Service and Load Rejection Reserve to be accredited for the Contingency Reserve Raise and Contingency Reserve Lower FCESS respectively. • Accreditation will be based on event data if available, or alternatively testing (for example, injecting different frequencies to review performance). • Market Participants are responsible for managing their offers to reflect current operating conditions. • Market Participants will be able to seek review of their speed factors through re-accreditation.
8	• TP provided an example of observed responses across multiple contingency events (see slide). • Accreditation will prioritise initial response (first few seconds) – AEMO is seeking to accredited for a speed factor that is exceeded throughout the response. The speed factor will be converted into a performance factor to reflect system conditions in WEMDE. Reaccreditation (including derating) is possible in response to observed performance. • AEMO will preference the largest quantity for accreditation.
9	• TP presented an example of Contingency Reserve trapezium (see slide).
10	• TP said there is automatic RoCoF accreditation for existing facilities. • Review of accreditation will occur following Market Start informed by observed performance and modelling data. • Accreditation will be on a machine basis. • Market Participants are responsible for modifying their bids to reflect their trapezium (based on the number of machines online).

11	• TP presented an example of observed responses (see slide).
	• OC asked if the dispatch engine would pay any attention to minimum generation – that is would AEMO prefer a RoCoF provider with a lower minimum generation?
	  ○ TP said yes that would be optimal but the dispatch engine is constrained by the operating state of the machine. For example, the machine may be 'trapped' in the trapezium and the dispatch engine can not turn it off. It is the Market Participant's responsibility to bid in a way that it exits the trapezium. This is because the dispatch engine cannot co-optimise for a machine turning off.
	  ○ OC whether there would be low prices in such a scenario.
	  ○ TP said it is expected losses in the energy market will be added to bids for RoCoF. The facility with a lower minimum generation (and the same SRMC) could offer cheaper RoCoF Control Service than another facility with a higher minimum generation.

12	• TP presented an example of a RoCoF trapezium (see slide).

14	• TP presented on the framework for new facilities. It is similar to framework for incumbent facilities.
	  o For Regulation the facility needs to demonstrate its ability to meet Automatic Generator Control (AGC) requirements (linearity, response time, response if SCADA or ACG drops out).
	  o For Contingency AEMO proposes to use observations to inform accreditation. This includes that the facility needs to be able to have a sustained output for up to 15 minutes after the event and AGC control during that period. Control validation is required in addition to consideration of speed factors.
	  o For RoCoF AEMO will consider modelling data to determine the facility's capability. It will also consider equivalent facilities on the system and testing and commissioning data.

16	• TP said there will be additional requirements for accreditation of new technologies.
	  o For Distributed Energy Resources (DER) aggregated to Virtual Power Plants (VPP), Project Symphony will be an opportunity to test concept.
	  o Electric Storage Resources and hybrid facilities will also be able to be accredited.

17	• TP presented an example of a trapezium for an Electric Storage Resource (see slide). • AEMO will need to test and review performance, including that droop settings will need to exceed the minimum Generator Performance Standards. AEMO is also exploring options for provision of synthetic inertia. • Initially inverter connected resources will not be able to be accredited for ROCOF control Service.
18	• TP said that multiple facility sub-types will be able to be accredited. AEMO needs to consider how the determine the capability of different technologies. This could include different trapeziums for different operating conditions. • AEMO also needs to work on forecasting accuracy for intermittent components. • TP said stakeholders previously asked whether different units behind a single connection point can be individually accredited and monitored. The default approach is all services will be considered on a sent-out basis, but further work is being undertaken.

19	• TP said AEMO welcomes feedback on the proposed approach (see email addresses on slide).
	• This procedure is in Box 2, meaning there is no set window for consultation.
	• AEMO will include the milestones for development of this procedure in the JIP.
	• Liz Aitken (LA) asked when stakeholders will be informed of the outcomes of Project Symphony.
	  o SF said AEMO will provide feedback offline or in a future WRIG.
	• OC said that facilities with different droop responses have different response speeds due to the slope of the frequency excursion. Does this mean that speed factors might change depending on the frequency excursion?
	  o TP said yes, AEMO is in the process of taking multiple responses and reviewing to determine an accreditation.
	  o Leon Kwek (LK) said it is a situation where AEMO would envisage the Market Participant would request AEMO reaccredit the facility with an improved speed factor.
	• OC asked whether a procedure will cover how AEMO will assess a facility's ride through capability.
	  o TP said that is not currently proposed to be included in the ESS accreditation procedure. AEMO needs to consider the most appropriate location for this. AEMO will consider and advise stakeholders where this information will be included.

Limit Advice Requirements – Josephine Nga (AEMO)	
	• LK provided an overview of the constraints workstream to date, noting the information presented in the procedures today is a continuation of the information initially presented to industry through the Power System Operation Working Group.
4	• Josephine Nga (JN) provided an overview of the constraints process at a high level (see slide). • Definition of limit advice is outlined in the WEM Rules (see slide).
6	• JN said the WEM Rules require AEMO to develop a procedure that outlines the information and data to be provided by Western Power to AEMO in respect of Limit Advice and the processes to be followed in providing that Limit Advice. • There are two forms of Limit Advice – thermal and non-thermal. • Specific requirements for Limit Advice relating to the Reserve Capacity Mechanism (RCM) will be included in the procedure and consulted on at a later date.
7	• JN provided an overview of the thermal limit advice requirements. • Western Power already provides thermal limits for real time contingency monitoring. AEMO consider this current practice is suitable and will not be duplicated. • Western Power must update existing thermal limit advice as soon as practical and provide thermal limit advice for new equipment three months prior to commissioning. This provides AEMO sufficient time to develop and test the relevant constraint equations prior to implementation.

8	• JN provided an overview of the non-thermal limit advice requirements. • Non-thermal limit advice is more complex compared to thermal limit advice. Therefore AEMO will review nonthermal limit advice to confirm their understanding of that advice and seek additional information if necessary. • See slide for a diagram of the process Western Power must follow in providing nonthermal limit advice.
9	• JN said the procedure will include detail of the format and other minimum requirements for non-thermal limit advice. See slide for examples. • Supporting information accompanying limit equations may include applicable network conditions, assumptions and whether a network reinforcement scheme is in place to assist AEMO interpret the limit equations.
10	• JN outlined the timelines for Western Power to provide AEMO non-thermal limit advice. This varies depending on whether the limit advice relates to significant network changes, outages or unforeseen errors (for example, bush fires and storms). • See table on slide for detail.
11	• JN outlined the process for AEMO to review non-thermal limit advice. • The purpose of the review to understand residual risks and unnecessary consequences before using limit advice to develop constraint equations. This includes identifying whether additional information/limit advice are needed. • AEMO will not review Western Power's assumptions as this is the responsibility of Western Power. • AEMO expects there will be several interactions with Western Power to finalise non-thermal limit advice.

12	• JN said that all limit advice and its inputs will be published by AEMO in the Congestion Information Resource.
	• AEMO will also undertake a periodic review and request any additional information/Limit Advice from Western Power as required.
	• AEMO will retire limit advice as advised by Western Power.
	• Mark Riley (MR) asked how Market Participants would be notified about changes to limit advice, especially short-term equipment ratings.
	  ○ LK said limit advice will always be available in the Congestion Information Resource. AEMO will come back to Market Participant on how they will receive notifications, particularly in real time.
	  ○ MR said that real time notifications are most critical.
	• Glenn Carruthers (GC) asked whether AEMO would have a naming convention. This would be useful to assist Market Participants understand which equations affect them, particularly though the network planning process.
	  ○ LK said that there is a naming convention in the dispatch engine, however it may not be fit for this purpose. The Congestion Information Resource is likely the most useful source of information for Market Participants. LK asked Western Power to send through any comments on naming conventions.

Developing Limit Advice – Mark McKinnon (Western Power)	
3	• Mark McKinnon (MM) outlined the structure of the draft procedure (see slide).
4	• MM said that the WEM Rules require Western Power to develop and maintain a procedure outlining the processes to be followed by Western Power in developing and updating limit advice.

5	• MM defined network, thermal and non-thermal limits (see slide).
6	• MM explained how thermal limits will be developed (see slide). • Western Power will provide AEMO thermal limits for its 256 transmission lines and 408 transformers. • Multiple thermal limits may be required for a given piece of equipment due to seasonal variations (i.e. different ambient temperatures) or depending on the direction of the power flow.
7	• MM explained how non-thermal limits will be developed (see slide). • Limit equations are calculated to a 95 percent confidence interval. • AEMO will add an operating margin that includes consideration other than network limits. This is to enable the system to be operated within operational limits.
8	• MM said Western Power must keep limit advice complete, current and accurate. • Western Power may need to develop new limit advice in response to connection of new generators/loads or network augmentations. • Limit advice will be published by AEMO in the constraints library. • Western Power is required to provide AEMO and ERA information in a reasonable timeline to support their functions, including the ERA's periodic review of limit advice and constraints.
9	• MM asked stakeholders to provide feedback directly to Western Power (see slide).
Constraint Formulation - Leon Kwek (AEMO)	
2	• LK said that the procedure has been drafted based on existing rules, draft amending rules and the expected approach to using constraint equations (noting this is subject to change pending further work). • There is some overlap with dispatch matters – these items may be moved to another procedure (TBC).

3	• LK said that the current intent is to include some explanatory information in the procedure to provide background and examples.
	• This explanatory content will not be formally part of the procedure.
	• An alternative is to include this explanatory information in a separate document, as occurs in the NEM.
	• AEMO seeks stakeholder feedback on which option would be most useful for them.
	• MR asked whether having the explanatory content could affect the procedure change process.
	  ○ LK said the intent is that explanatory information would not be subject to the rule change process.
	  ○ MK suggested removing the explanatory information and placing it in a separate document when the procedure goes 'live' at Market Start.

4	• LK explained that constraint equations are structured so that the:
	  o Left-hand side includes the controllable terms – for example, dispatch targets and other variables the dispatch engine can optimise.
	  o Right-hand side includes all other variables – for example line flows and other system measurements.
	• See slide for diagram.

5	• LK outlined the standard methodology for formulating constraints is used in most cases (system normal) and fully co-optimises constraint equations. • These constraint equations are consistent with real measurements in the system. • The constraint equations are published in the constraints library and are visible to the market. • An alternative formulation is required when the above conditions do not apply (for example, the required constraint equation is not available due to unforeseen system conditions).
6	• LK explained the constraint equation classification (see slide).
7	• LK said that AEMO will apply an operating margin to all constraint equations. This is separate from and in addition to a limit margin. • An operating margin is required as some variables cannot be included in constraint equations – for example, real-time factors AEMO cannot control or variables that would make co-optimisation too complex if they were included in the dispatch process. • This operating margin will be selected based on the acceptable level of risk – a more conservative operating margin decreases the likelihood of a risk eventuating.
8	• LK explained AEMO's preferences in developing operating margins (see slide). • For each constraint equation, AEMO will document the explicit reason the constraint equation exists. This enabled informed consideration of risk trade-offs.

9	• LK outlined how AEMO will apply operating margins.
	• The default application is a conservative operating margin – for example, for new facilities where there is no observed data.
	  o If the operating margin does not bind frequently, then detailed analysis is not required.
	  o If the operating margin frequently binds, then AEMO will undertake detailed analysis to assess whether it can be made less conservative. This includes using real-time experience and observations to recalculate the operating margin. This recalculation will generally be an iterative process.
	• MR asked whether the operating margins will be published.
	  o LK said yes they will be published in the constraint library.
	• MR asked whether this will show the gap between the proposal and the actuals to show the headroom.
	  o LK said the margin is not the difference between the dispatch outcome and the constraint, it is the margin on the constraint itself.
	• MR asked what happens if a constraint frequently binds?
	  o LK said that if this occurs then AEMO will focus attention on assessing the accuracy of that constraint, including using SCADA data and other observed data to recalculate it.

10	• LK outlined the error sources that creates the need for an operating margin (see slide).
11	• LK described the ratings for the likelihood of a risk eventuating (see slide). • AEMO can adjust the operating margin to increase or decrease the likelihood of a risk eventuating. • When AEMO considers error sources (for example, SCADA data) is assumes the accuracy and distribution (for example, if it looks like a normal distribution it will assume it is). • It will combine error sources to get the overall error distribution.
12 and 13	• LK outlined the categories of risk consequences (see slides). • If there is not a specific risk outlined in a rule or other obligation, AEMO will develop an operating margin that achieves the low category. • For example – AEMO would generally apply a 5-10 per cent operating margin to a transmission line. This accounts for errors such as drift of generators and the accuracy of field measurements. • This risk approach may have applications broader than constraints and therefore may be moved to another procedure (for example, the power system security procedure).

14	• LK explained there can be multiple constraint equations for a single line for different contingencies. • Similarly, a single contingency may have multiple constraint equations as it effects several associated network elements. • It is preferable to have many simpler equations than a single more complex equation. This is to enable readability and is the approach used in most jurisdictions. • AEMO will filter equations based on their coefficient size. If the coefficient will have a very small effect then it is removed to minimise 'noise'. • A change in configuration of the network requires new constraint equations to be developed.
15 and 16	• LK explained the open-loop approach to constraint formulation. • It is not the preferred approach as it is not robust. This is because it requires more detailed modelling and there is greater potential for failure.
17	• LK said AEMO will use the feedback formulation as it is more robust. • This is consistent with the GIA constraints and newer constraints in the NEM.
18	• LK said all current and archived constraint equations will be publicly available in the constraints library. • The constraints library will be in the Congestion Information Resource, which will include other related information.
19	• LK explained the alternative constraint formulation. This formulation is used for: o Discretionary constraints – developed in real-time to manage unexpected or extreme conditions (for example, generator non-compliance) o Stop-gap constraints – temporary constraints to return to the standard, fully co-optimised formulation.
20	• LK outlined the constraint naming conventions (see slide). • LK invited Western Power to provide input to naming conventions.
21	• LK explained the process for quality control, which will be outlined in an appendix to the procedure. • This includes playback analysis, simulations and real-time monitoring – with the objective to assess whether an appropriate operating margin has been applied.
22	• LK provided the contact details for stakeholders to provide comment (see slide).
	Next steps
	• SF outlined the procedures will be consulted on for four weeks from when they are circulated with the WRIG minutes (noting the ESS accreditation procedure is in an earlier stage of development and has no formal consultation

	timeframe at this stage - all comments welcome back to AEMO and updates on future milestones for this Procedure will be shared at an upcoming WRIG). • AB said ETIU will continue to engage with the ERA and Western Power on the development and consultation for their procedures. • AB asked if stakeholders can please arrive for prompt commencement of future meetings. • AB thanked stakeholders for their contributions and acknowledged it would be a busy time over the next two months. • AB encouraged stakeholders to contact ETIU to provide feedback.