

MINUTES

MEETING: NEMOC
DATE: Monday, 8 October 2018
TIME: 9:30AM – 3:30PM
LOCATION: Stamford Plaza, Sydney Airport
MEETING 13

ATTENDEES:

NAME	COMPANY / DEPARTMENT
Christian Schaefer	AEMO (Chair)
Kylie Carns	AEMO (Secretariat)
Verity Watson	Energy Networks Australia (ENA)
Kate Summers	Clean Energy Council (CEC)
Mike Paine	TasNetworks
Andrew Kingsmill	TransGrid
Naresh David	Australian Energy Council (AEC)
Rainer Korte	ElectraNet
Greg Hesse	Powerlink Queensland
Norman Jip (Proxy)	CEC
Ben Skinner	AEC
Blake Harvey	ENA

APOLOGIES:

NAME	COMPANY / DEPARTMENT
Tim Lloyd	AusNet Services
Lillian Patterson	CEC

1. Welcome and introduction

- Chair welcomed and introduced members to meeting

2. Minutes of Previous Meeting and Actions

- Meetings minutes were accepted.
- Previous actions to be reviewed prior to next meeting.

ACTION 13.2.1: June meeting's actions to be reviewed prior to December meeting (NEMOC members)

3. Working Group Updates

3.1. FCWG

- The frequency of meetings for the FCWG needs to be reviewed. Call for more consistent meetings and communication from the working group to the NEMOC.

ACTION 13.3.1.1: Meeting schedule to be reviewed (James Lindley/Andrew Groom) to meet more frequently if needed

- The report for the Tasmanian trial is still to be finalised and discussions around the communications on this project from the working group were addressed. Martin Ringrose has been engaged by AEMO to finalise the report for circulation to the NEMOC
- The Mainland Frequency Trial is a large body of work, therefore there is a call out for new members to join the taskforce. Transgrid (Andrew Kingsmill) suggested that members that are Policy bodies should be invited as guests and not as members due to the Technical nature of this trial and not it being a regulatory nature.

ACTION 13.3.1.2: AEMO (James Lindley/Andrew Groom) to invite new members

- Due to internal AEMO workload (due to Summer readiness) there are delays in commencing the mainland trial project, but this should be industry owned and not AEMO centric. AEMO initially underestimated the size of the issue, therefore definite timeframes and milestones still need to be documented. The FCWG were requested to provide a plan before summer and they have now advised it will be delayed. An updated report is requested by the next NEMOC meeting.

ACTION 13.3.1.3: FCWG (James Lindley) to present report on mainland deliverables by next meeting

- AEC (Ben Skinner) noted that this body of work was initiated by AEMO in response to its concerns about the delivery timing of frequency stabilisation from market solutions (AEMC). The Energy Council recognised AEMO's desire to address this urgently but not at the detriment to other vital projects. Energy Council suggests this project does need a start and end date.

3.2. PSMRG

- The NEMOC agreed that the proposed new members Alan Louise (Energy Queensland) and Stephen Fraser (SAPN) be added to the working group.
- Request that the PSMRG explain as to why the AER/AEMC have been added to the proposed membership

Action 13.3.2.1: PSMRG (Babak Badrzadeh) to explain as to why the AER/AEMC are proposed members

- PSMRG are to consider development of standard guidelines for PSCAD modelling across the NEM (including suggestions on how single database models can be shared). AEMO (Christian Schaefer) suggested that making this available to industry in longer term and called for suggestions from the NEMOC and PSMRG how a single PSCAD database model can be shared. ENA (Blake Harvey) agreed that a modelling application would bring greater efficiency for the industry.
- CEC (Kate Summers) stated that it is important to understand what happens when the systems (synchronous condensers) are turned off and on; this can cause instability. What are the solutions on getting settings of everyone's systems? The stability question needs to be a focus.
- There are industry concerns around the Mudpack tool used for small signal stability analysis. The software has been supported through an ongoing R&D agreement. It is now highly specialised, and due to Adelaide Uni resource constraints, we are not getting

timely delivery of contracted services, or project partner perceived value for money. There are also concerns regarding the succession planning for ongoing support. AEMO and TNSPs have not renewed the R&D agreement and instead have entered into a licencing arrangement for the software and a fee for service arrangement for other work while longer term plans to support the small signal stability requirements are considered. A consultation paper has been developed that discusses the pros and cons of Mudpack and alternative commercial software solutions. Albeit highly technical, it does not include the recommendations of the PSMRG based on the outcomes.

ACTION: 13.3.2.2. PSMRG (Babak Badrzadeh) to update NEMOC of small signal stability software recommendations

- PSMRG proposed to add four new members, including representatives of the AER and AEMC. The NEMOC agreed on the two industry-based additions but requested more information why regulator and commission reps are required in the technical working group, remembering that this is an operational committee with technical, not regulatory working groups.

ACTION: 13.3.2.3 PSMRG (Babak Badrzadeh) to report back to NEMOC on member recommendations from industry

3.3. OPWG

- Discussions centred around the 25 August event. There is growing concern about the current UFLS arrangements. Both Queensland and South Australia experienced some issues during the 25 August event, The OPWG will be discussing UFLS arrangements at the next meeting end of November.

Action: 13.3.3.1 OPWG (Sujeewa Rajapakse) to present further information regarding UFLS arrangements at December meeting

ACTION: 13.3.2.3 OPWG to provide an update on NOS to the NEMOC

3.4. PSSWG

- The planned presentation on Control Room issues (succession planning, automation, managing emerging phenomena, training etc), was deferred until December meeting.
ACTION: 13.3.4.1 AEMO (Daniel Lavis to present at next meeting)
- The AER is interested on how much money is used on cyber security in the NEM
ACTION 13.3.4.2: AEMO (Tim Daly) is requested to join next meeting to present on Cyber Security
- Discussions centred on a report regarding deliverables for this working group with milestones and dates for deliverables.
- Noted that if there are compliance obligations to respond to issues, then companies are required to respond within timeframes

ACTION: 13.3.4.3 PSSWG (Sujeewa Rajapakse) to obtain a brief from other regions in relations to NEM Power Issues and report back to the NEMOC at the next meeting

4. Governance

4.1. Communications strategy

- It was agreed that AEMO will keep the NEMOC documentation on its website. Minutes are to be made public as soon as possible with confidential matters to be dealt with by exception. No personal contact details will be listed on the website.
- The NEMOC Communications Strategy is still undefined and needs to be completed by the committee

ACTION: 13.4.1.1 Communications Strategy to be completed by Committee – all members to provide comments and feedback on memo

- The meeting discussed a possible technical standards initiative. It was suggested this was maybe too ambitious for NEMOC to create but maybe through input to the working groups of Standards Australia directly, we can assist. Another suggestion was that this could possibly sit with the AEC and include what the technical standards for generation should be in the future. The direction of this strategy was not completely clear and caused some confusion amongst members.

ACTION: 13.4.1.2 AEMO (Damien Sanford) to clarify what is requested and why

4.2. 2019 NEMOC Strategy

- Clarity is needed on what is to be included as deliverables in the 2019 NEMOC Strategy and if a Technical Standards committee establishment should be included, noting that the majority of the NEMOC members did not consider a separate TC to be warranted.

ACTION 13.4.2.1: ALL to submit suggestions on projects/issues and deliverables for inclusions in the 2019 strategy

- Inclusion of the Distribution System Operator (DSO) models to be included in the strategy. Questions raised included; How is it going to be operationalised and coordinated? The deliverable still needs direction and further discussion, but a potential white paper led by the NEMOC is a possibility. Further information is needed on the DSO Scope

ACTION: 13.4.2.2 ENA (Blake Harvey) to bring information back to NEMOC regarding DSO scoping work being undertaken by ENA (Open Networks initiative), for discussion at December meeting

- The NEMOC needs to review the working groups and how they report back to the NEMOC. Further clarity is needed on what the NEMOC need to see and what is reported into the committee. If further functions are created, NEMOC need to take the technical and engineering requirements on board and not allow market issues to dominate decision making.

ACTION 13.4.2.3: ALL- Suggestions on reporting methods to be provided to the Secretariat

5. Presentation- 25 August Separation Event

- Christian Schaefer presented on the incident of 25 August 2018. Discussions around the details of the event leading up to and after the incident included:
 - Load shedding as a result of UFLS to the total amount of 1,100MW.
 - There was significant battery and solar generation activity during and after the event
 - The need to review the data regarding load responses/battery etc is a possibility

- islanded system frequencies did stabilise after separation, with load shedding events in multiple regions, except in SA and QLD
- CEC recommended that AEMO make a public statement to not use data from AGC (AGC still referenced to Sydney and could confuse islanded system analysis).
- There was only a small amount of synchronous generation loss during the fault, in addition to some solar and wind generation that disconnected during the event.
- The event has created a large amount of data and provided a lot of information on systems. There still a lot of analysis to be done, and investigating is continuing
- The final report is expected to be published no earlier than 30 November 2018

ACTION 13.5.1: Mark Stedwell to present on 25 August system event at the December NEMOC Meeting

6. Mainland Frequency Trials presentation

- James Lindley joined the meeting to discuss the Mainland Frequency Trial in further detail. Discussions included the following:
 - Work is commencing on a mainland frequency trial, based on the Tasmanian trial. Work is slower for the mainland trial due to Tasmania being very straight forward as there was only one system with one Generator and one TNSP. Mainland trial involves a lot of components that need changing and not as simple to complete. With the workload that this is creating, design and commencement of trials are now to be pushed back to after the summer 18/19 period (from April 2019).
 - AEMO are still waiting on the final report of the Tasmanian trial which is expected to be end of November 2018, and this will then be distributed to NEMOC once complete
 - AEC (Ben Skinner) asked for more detail on the proposed three-month trial period. AEMO noted that there are significant changes that are needed and the FCWG will be liaising with participants regarding the details in the near future
 - Interest from the NEMOC included:
 - how the changes would affect the market – from small to large deviation
 - If a caveat should be created by AER and legal teams regarding the upfront details/changes and work ahead
 - FCWG's next session is to be end October/November- AEMO to advise of the secured date
 - A trial in short term purchasing on regulation FCAS is on the 12 October 2018. This will be an opportunity to see if any improvements can be made during this trail

7. Summer Readiness Review Update- Ken Harper

- Ken Harper (AEMO GM Operations Support) joined the meeting and presented on the Summer Readiness Program. The following points were discussed:
 - There should be a more detailed BOM report in the next couple of weeks

- EEAP has been requested from generators and is due in three weeks. This will be updated by the end of November. Extensive work has been going on with Generators in relation to conditions
- MTPASA has had a few changes since report was sent to NEMOC.
- There are numerous discussions with Generators and TNSPs. Transmission providers have been issued with a schedule for outages which has gone through the OPWG for approval.

ACTION 13.7.1: AEMO (Ken Harper) to circulate schedule outages document to NEMOC

- There seem to be a lot of new physical network connections over summer period. Requests have been made that Operations work with the TNSP's to discuss outages scheduling etc to minimise load loss.
- RERT: currently processing tenders. The biggest gap is in VIC and its envisioned to share the gap between VIC and SA. This should be finalised within the next couple of weeks
- Operations Improvements were issued on Friday last week (5/10/2018) Updated reserve and guidelines are up for review. A further discussion paper regarding changes and models has been sent for comment from participants which is due back within the next two weeks
- There are an additional 17 weather stations being implemented and AEMO are working closely with the BOM. These extra stations will provide more granularity.
- A contingency planning joint exercise with Jurisdiction and AusNet is set for 9 October- Both Norwest and Brisbane AEMO sites are involved.
- SRAS training and awareness program will commence in October/November
- Key Activities;
 - Note: dates in October for execute RERT contracts
 - November – updated EAAP
 - Summer Readiness briefing invites been sent out
 - Preparing report to go out for Summer Outlook report – publish for industry briefing
- TransGrid (Andrew Kingsmill) noted that outages are potentially flexible. Generators will indicate that they need outages, but these can be changed around to suit the demand
- For the November/March period, there is a slight error in PASA and AEMO is looking into the error.
- NEXT STEPS: Briefing and meeting with TNSP's to discuss issues and challenges at present
 - OPWG approved NOS enhancements- need further review
 - Will discuss with OPWG what enhancements and changes are needed

ACTION 13.7.2: NEMOC to be updated on NOS enhancements by AEMO (Ken Harper)

8. Modelling and Data Requirements on Generators- Naresh

- AEC (Naresh David) discussed Generator concerns over implementation of the Power System Modelling Guidelines, and the request for the 20-day timeframe for submission of models when requested by AEMO to be reviewed. In addition to the required time, the potential cost involved in providing modelling data is an issue for approval from

management. David suggested that it will take longer than 20 days to develop models and can cost up to \$2million [across an entire portfolio of generating units]. Points on the discussion are as follows:

- Section 4.1 of the guidelines states that models are required for new and modified plants. The intent is not to cause financial issues for Generators, but to address new and modified plant information gaps and get sufficient data for modelling system security.
- The PSMRG have been asked if they can use generic modelling and provide feedback to generators/ participants.

ACTION 13.8.1: AEMO (Babak Badrzadeh) to update NEMOC by next meeting

- CEC (Kate Summers) noted that local AVR testing could possibly assist with gaining guidelines required data for synchronous generators.
- AEC (Ben Skinner) commented the risk is that the request could be asked at any time. Further clarification is needed, and AEC suggested communication such as “if non-modified generator needs modelling that you have longer”. The issue is the 20 business days. AEMO noted that it would endeavour to work with Generators to collect the required data in manageable time frames.
- Christian noted that the Guidelines Rules change determination is complete. The consultation process ran for around two years and there was opportunity to raise issues and concerns. It is not possible to rewrite the Guidelines now.
- TransGrid commented that incumbent generators need to provide information in a timely manner to support the connection of new applications.
- TransGrid (Andrew Kingsmill) commented that further agreement is needed going forward with Generators and PSMRG to meet and make an agreement. This issue needs to be co-owned by AEMO and Generators
- PSMRG to discuss the possibly change of timeframe at the next NEMOC meeting

ACTION 13.8.2 : AEMO (Christian Schaefer) to discuss timeframes/wording and above discussions with Babak Badrzadeh and report back to the NEMOC at next meeting

9. BOM PRESENTATION

- Andrew Watkins from the BOM presented to the NEMOC on Summer Forecasting 2108/19
 - BOM is moving to a new climate model – AXIS S (Seasonal). This system can be used for all weather forecasts and this modelling system can forecast from a few hours to a few months ahead. This new model also provides more detail in higher resolution in areas than its predecessor
 - The ‘Information Outlook’ will be updated 09 October 2018. Forecasts are predicting an El Nino event happening through summer which will cause a higher bushfire risk and a late start to a wet summer (Tropical cyclones – drier and warmer)
 - With El Nino, the Pacific and Indian oceans are the drivers that are indicating less rainfall and warm days in the west and the south of the continent. With this, there is an increased fire risk for South East continent.
 - October through to December will very dry all-round the continent

- Heatwaves are an upward trend. Seems that there will always be a heatwave in summer

ACTION: 13.9.1 BOM (Andrew Watkins) to seek further information if the ski season run-off makes a difference

- Southern cities will tend to have sudden, windier and shorter heatwaves this summer. The weather system will go through these cities quicker. Sydney and Brisbane tend to be for longer. It's unusual to see heatwaves in SA and VIC at the same time as NSW and QLD
- The southern continent bushfire season is predicted to start earlier this year.
- The east coast has a higher fire risk than normal this summer due to dry dense forests which is a concern. Due to low rainfall and slow grass growth, the inland areas are less at risk for grassfires.
- The definition of a heatwave is the temperature being in the top 10% of the 90-percentile average in the same area.

10. Systems Strength Update

ElectraNet (Rainer Korte) discussed the following System Strength update with the NEMOC:

- AEMO identified a system strength gap in SA last year and ElectraNet have been working to close the gap since. Synchronous condensers are the proposed solution and ElectraNet have committed to a no-regret solution of two condensers to be implemented into the network, but further investigations are still needed to finalise specification. There are three manufacturers that have been identified as having the equipment that is needed. These condensers will be situated at Davenport.
- In the future six to eight condensers may be needed. There is still uncertainty but every month that they can bring the solution to the gap, saves customers millions of dollars.
- There will be a tendering range of 100MVA each synchronous condenser and both will have high inertia and have flywheels connected
- Information on this has been made public several months ago via an information sheet. ElectraNet have been working closely with AEMO, The SA Government and the AER to ensure alignment with all parties. The economic case has not yet been made public.

AEMO (Babak Badrzadeh) joined the meeting to present the presentation from the CIGRE conference on System Security and ElectraNet investigations

- AEMO are working closely with ElectraNet on PSCAD system strength modelling. Thus far over 1,000 combinations have been identified with synchronous condensers in SA. There are differences in the PSSE models compared to the PSCAD modelling.
- The secure asynchronous operating level was previously noted as a 1,200 MW start, but now has been increased to 1,295 MW.
- Some combinations are better than others depending on what synchronous generators are online
- Investigations are underway to determine if the system can operate with asynchronous generation and synchronous condensers only. Further research is needed from a system security point of view and what the load/volume would need to be. Synchronous condensers can provide limited VAR regulation and capability which needs further investigation. Further details are needed to confirm if they are capable

of providing necessary voltage support. The primary focus presently is to meet the system strength gap levels, determine what is available and has good contribution to fault level requirements. Next is to meet the gap between transition period and available units with the aim to provide contribution to fault level and set requirements.

- ElectraNet continue to work closely with AEMO on this matter.

ACTION 13.10.1: Full CIGRE Presentation to be sent to NEMOC by Babak

11. Other Business

- Power System Conditions for the future
 - Queries were raised about the ongoing work on the PSC and how working groups are going to provide timelines, milestones and guidelines. Suggestions that AEMO set boundaries regarding the DER and how it is communicated with the AER.
 - Suggestions of a charter and register of information to curtail wrong information being distributed
 - Upcoming and completed Rules changes should be reviewed by NEMOC to evaluate operational impact.
 - CEC (Kate Summers) noted that at present, with the low system strength issue a NSP can state that they are at maximum level when it's not the case. Communication (and education) around maximum fault levels need to be reiterated. Forward planning may see an issue as they may be built in.
- A proposal for a new working group was discussed. The objective of this WG is to investigate and consider any issues, constraints and limitations of the existing or future communications infrastructure and processes of the NEM. This could include issues such as limited band width in PLC communications to remote areas, increased demand for measurement data from renewable energy sources and storage devices, and cyber security.

ACTION: 13.11.1 CEC (Kate Summers) to draft proposed scope of works of new Communications Systems Working Group for discussion at December meeting

- Impact on the system for inverter-based generation. It was requested emerging issues be presented at the next NEMOC meeting.

ACTION 13.11.2 AEMO (Jenny Riesz) to present emerging issues at December NEMOC

- Regulators have requested to have an observer from AEMC to NEMOC. This will be considered on an agenda basis.

Meeting closed at 3.10pm

Next meeting 12th December – Tas Networks to host

Optional dinner on 11th December