MINUTES

MEETING:	NATIONAL ENERGY MARKET OPERATIONS COMMITTEE | NEMOC
DATE:	Wednesday, 13 September 2023
TIME:	9AM – 12PM (Sydney / Melbourne Time)
LOCATION:	AEMO Offices – L22, 530 Collins Street, Melbourne | Online - Microsoft Teams
TELECONFERENCE DETAILS:	Microsoft Teams By phone: +61 2 8318 0090,,500111222#

ATTENDEES:

NAME	COMPANY DEPARTMENT
Tjaart Van der Walt	AEMO *(Chair)*
Alexis Bowman	AEMO *(A/Secretariat)*
Ken Harper	AEMO
Leanna Tedesco	AEMO
Michael Gatt	AEMO
Teresa Smit	AEMO
Hugh Ridgway	AEC / Alinta Energy
Peter Brook	AEC
Nigel Buchanan	APA

NAME	COMPANY DEPARTMENT
Tim Lloyd	AusNet Services
Christiaan Zuur	CEC / Neoen
Scott Partlin	CEC / Neoen
Lucas Milmore	ElectraNet
Glenn Springall	ENA / Energy Queensland
Emma Rogers	Powerlink
Jason King	TasNetworks
Jason Krstanoski	Transgrid
Jennifer Hughes	Transgrid

GUESTS:

NAME	COMPANY DEPARTMENT
Daniel Lavis	AEMO
Darren Spoor	AEMO
Gus Frandina	AEMO
Harmohan Singh	AEMO
James Lindley	AEMO

NAME	COMPANY DEPARTMENT
Luke Robinson	AEMO
Rajesh Nighot	AEMO
Sujeewa Rajapakse	AEMO
Zander O'Flynn	AEMO

APOLOGIES:

NAME	COMPANY DEPARTMENT
Verity Watson	ENA

NAME	COMPANY DEPARTMENT
Ross Burridge	TasNetworks

1 WELCOME

- Tjaart welcomed members to the meeting and noted the apologies.

2 PREVIOUS MINUTES AND ACTIONS REGISTER

- Previous meeting minutes (23 June 2023) were accepted with no changes made.
- Actions Register was reviewed and actions amended accordingly.

3 PRESENTATION | NEM Reviewable Incident Trends FY 22-23

Zander O'Flynn

- Zander presented on NEM Reviewable Incident Trends:

NEM Reviewable Incident Trends Presentation

- Update to ROI Guidelines.
- Number of Incidents – Trends.
- Root Cause Trends.
- SCADA Failures Leading to Market Suspension.

i. MEMBER QUESTIONS AND DISCUSSION

ROIs due to human error were discussed. What caused the human to make that error is what should be considered. Was it a procedural cause, training, or what is the root cause? That is what we need to be looking into. The PSSWG has previously investigated human error factors. Members were asked if they should request the PSSWG to investigate again.

- It was noted that the question should potentially be targeted towards what should we do and it has impacted on a lot of its brownfield cut ins, but what should be done proactively?
- Michael noted that while the volume of work is a contributing factor, consideration must be given to control systems to try and eliminate the risk. We need a system view of this or become more tolerant to the impact. A review is currently underway, with industry involvement to consider this more broadly. If we took on a health and safety view of this, top consideration would be how to eliminate the risk. A concern is that industry is becoming too tolerant to the fact of these impacts and it is unsure if we are in a position yet, where we could engineer it out of our system.
- Understanding impacts of human errors will also help with some of the new things that are having bigger impact than may have been anticipated and also provide insight as to what should be prioritised.
- Commissioning of new REZs and ambitious timelines will also put considerable pressure on people, which has the potential of increased errors. We should aim to engineer these out of the system.
- This supports the importance of the NEMOC and working groups and the need to share learnings over the coming years to foster achievement. We will all be learning at a pace to meet ambitious timelines.
- Resilience and recovery, from a market impact point of view, puts the most pressure on all of us. Knowledge and experience of staff may impact recovery times and pose a very high inherent risk. There are a series of indicators that tell us about system health. What we are trying to do is keep visibility of the risk low.
- It was suggested that the NEMOC collectively produce a standard set of questions that may be asked when there is ROIs due to human error. Questions around experience, third parties, adequate processes and training, controls etc. It will assist with root cause analysis, trend analysis and problem solving. With all due confidentiality adhered to.
  - Issues will be discussed at a high level by the NEMOC and distributed to relevant the working group for action.
- It was asked if there is a generic bowtie system for this control system? Is there a control system view of all the elements, showing what is factually incorrect?
  - It will be up to individual TNSPs to provide their control system view and information – this will be used only for NEMOC and not incident reports.
- A further insight provided on a potential way to reduce human error issues. It has been observed that a considerable number of human errors occur during testing phases of generators. When an operator is asked to put a generator into a state that it is not normally in for the purposes of a test or validation. They may have set it up wrong or set it up correctly and forgot to revert back after testing. This is something that could be focused on.

ACTION –TNSPs to reflect on appropriate questions that are common to human error related events, focusing on the controls that would help mitigate the event and the consequences of the event and share that with the group for endorsement at the next NEMOC meeting.

4 PRESENTATION | Incident – Loss of SCADA at Keilor Terminal Station

Zander O'Flynn

Loss of SCADA and Protection at KTS Presentation

- Zander presented on the Loss of SCADA incident:
  - Sequence of events.
  - Impact of events.
  - Root cause.
  - Next Steps

ii. MEMBER QUESTIONS AND DISCUSSION

- It was proposed that the group collectively seek funding to be able to improve technology that will make a considerable difference to functionality in control rooms and with the increasing number of alarms.
- Work out ways to look at how we use these examples and produce some collective statements that support that need and help us in being able to fast track how we get to a place of having the funding and the tools and the systems in place to support this.
- Tjaart discussed the CSIRO project 'Control Room of the Future'. He will look to include TNSPs in that conversation.
- Michael noted that in regard to funding, which is a compliant obligation, one of the key questions is what is holding it up? That is the priority. The obligation and expectation are clear around SCADA and systems, however it does not have a clear pathway from a regulatory perspective and will need further investigation.
- Members discussed obligations that may be put around having a system and secondary system expert always in the room to help with this, as another way to address the issue, as well as the need for systems protocols.
- Michael reviewed the challenge of resilience in people and systems and their ability to ride through incidents, recover faster and be confident that something will not fall over again. In time, traditional communication pathways will be questioned to see whether or not we think the current strategy of redundant communications infrastructure is sufficient for the risk. Are the systems adequate for the task?
- The challenge of the regulatory environment is that we operate in the non-credible space, however our investment models are in the credible space. NEMOC should be about recovery. Our resilience pathways need to consider non-credible and that is where investment should be supported.

ACTION – Tjaart to include TNSP representatives in future discussions for the 'Control Room of the Future' project.

5 AEMO/TNSP Discussion around Access to modelling data and when it should be provided – should this be part of the PSMRG?

Luke Robinson

- Luke responded to questions raised at the previous NEMOC meeting. Luke has worked with Rajesh, the new chair of the PSMRG and put together some additional information, which is included in the PSMRG update.
- AEMO share power system models of the NEM under 3.13.3 of the NER that enables TNSPs and registered intending participants and developers to access models of the east coast system. This is to undertake connection studies, planning studies, operational studies etc. TNSPs have direct access to OPDMS that contains PSC models. This is provided as a cost recovery service. There are KPIs in place around provision of data and timeframes.
- Tjaart confirmed that this should fall under the Power System Modelling Working Group. The role of the PSMRG would be to set standards for the models that are include in the OPDMS and managed by AEMO and then AEMO provide these models to participants.

6 Prioritisation of topics – Member feedback on scheduling separate meetings or workshops:

All | Tjaart Van der Walt

- Implications of no longer having the OSM – existing manual scheduling processes.
- Load Shedding.
- REZ Principles and Operations.
- System Security Responsibilities – SO – Regional System Operators.
- System Restart.
- Existing processes to schedule NSCAS contracts.
- Control Room of the Future (added to list during the meeting).

- IMPLICATIONS OF NO LONGER HAVING THE OSM – That was drafted a couple of months ago, however recent events have taken over, as AEMC has released a directions paper, The public forum is scheduled for 14 September and are due at the end of September. AEMO will identify gaps, which TNSPs will have to resolve the gaps. If they are not resolved, AEMO will be the last resort. There are proposals included around how scheduling will operate. There are also sections around the directions process and the compensation process and how they will operate, which are radically different to existing processes. AEMC is going from a directions paper to a final report without an interim.

- It was discussed that some of these items move faster than NEMOC meetings are held. Is there something that the NEMOC needs to consider how to coordinate things that move faster than the NEMOC.
    - Michael responded that sometimes in Operations, we lose sight of all the moving parts. Many are designed to help and we lose perspective on that from time to time. These issues will be discussed at the EJPC workshop following the NEMOC meeting. It is worth our while to have a good perspective on things that are happening in reform and OSM is one mechanism that sits among many other changes. All businesses have regulatory people monitoring these issues and consulting on real time issues. Periodically having the NEMOC engage and collectively provide views is a great help.
- LOAD SHEDDING – AEMO has carried out a desktop exercise with all control room staff as part of the Skills Maintenance and Simulator (SMS) training program. We derived basic principles to apply when we get to the point of load shedding and the trigger levels and how we decide how much load to shed, the timeframes etc. These principles will be clarified and another training session delivered. Tjaart will then have separate sessions with TNSPs and DNSPs to discuss the principles and potentially undertake a desktop exercise for load shedding.
- REZ PRINCIPLES AND OPERATIONS – Discussions have found this is being approached differently in each region. Differences in who is managing REZ and how it is being managed. This relates to the next item of system security responsibilities for a delegated system operator. Operationally, REZ is defined in AEMO's operational procedures and regional procedures. Under the NER, AEMO must have a regional procedure for REZ.
    - It was noted that regardless of who is doing what, REZs are fundamentally similar and will have similar impacts on internet work testing, whole point testing, acceleration of generation coming online and concerns around commissioning plans. There are things we can all coordinate on to make the process work well to reduce the risk.
- SYSTEM SECURITY RESPONSIBILITIES – From 1 October 2023, AEMO has a new instrument of delegation between AEMO and Transgrid. The biggest change is that Transgrid, in the event of a communications failure between AEMO and the Transgrid region, they will take over the system security responsibilities. AEMO's responsibility is to maintain the system in a secure state. In this delegation, the TNSP is to maintain the system in a satisfactory state. This is due to the capability of the TNSP to maintain a secure system, as they do not have all require tools and systems.
- SYSTEM RESTART – James and Tjaart have discussed system restart and SRAS, a system restart service. AEMO's responsibility is ensure they have contracted restart services in the region.
- EXISTING PROCESS TO SCHEDULOE NSCAS CONTRACTS – In the future the challenge with NSCAS is what will it look like when every participant has a contract with a different value and different support. How are we going to figure out what is the most effective and how does that fit into the market? It is a challenge on how we actually do that. This can be linked to the first item about implications of no longer having the OSM.
- This issue was raised around whether or not there was going to be a scheduling UCS type mechanism to schedule the system strength contracts. The question was raised about how are the existing bilateral contracts, the NSCAS contracts, currently scheduled?
- Ken discussed the fortnightly industry briefs and feedback received from participants about testing internet work capabilities to their approved regulatory determinations and a number of the interconnectors have struggled to reach those output levels as expected, in the timing that was expected. There may be the ability for TNSPs to include plans or get funding for plans to allow those testing conditions to occur. Participants provided strong feedback around what can be done as an industry to get the interconnectors running to the capabilities in the timing that is needed for future conditions.
- Tjaart referred to NER clause 5.4.4(a) – which allows TNSPs to convince the regulator it is a worthwhile investment.
- Jennifer discussed that the NEMOC need to stay a very firm case about the opportunity to bring generation online sooner by having those market conditions exist and communicate with the regulator around what that may require retrospectively and prospectively.
- It was noted that the AEMC is moving towards a priority access model, which overrides dispatch and changes outcomes on the system. Some preliminary modelling has been done by AEMO in terms of what we have done in terms of those impacts on dispatch and the CEC has some significant concerns about this. What that may mean to outage application limits as well as more general impacts on connection. Things are moving quickly towards rules being put to the AEMC at the next ministerial meeting in November. Members were asked if they are comfortable with the operational implications around this significant piece of policy reform?

- The AEC, at the last Transmission Access Technical Working Group, the modelling presented by AEMO was inconclusive. There were a number of unexpected results and it affected the RRP. The AEC is concerned about this and is requesting a separate briefing from the representatives of that working group to AEC members.
- Regarding REZs and connecting back to dot point one, how would industry operationalise different access levels depending on what people invest in said asset. Then what is the remainder? It is important to make sure the whole community gets whatever is possible out of it. People are willing to invest at different levels to get different access. Operationalising access levels were further discussed as well as AEMO's progress with the relevant modelling.
- Modelling results presented by AEMO were running through NEMDE and were changing the MFP for participants depending on their level of priority access. An indication on the progress of modelling was requested by the AEC (PB). This can be discussed with the correct people in the room at an ad hoc meeting. Tjaart will discuss and organise.
- A point raised was about how the priority access would be affected by the outage constraints. It is being done so that under the basis of system normal, one of the key concerns being raised is how does the application of outage constraints and limits apply in a world where there is priority access? This is a potential killer for investment and a current key gap area that requires guidance.

ACTION – (1) Tjaart to organise an ad hoc NEMOC meeting to discuss the challenges of REZ – performance obligations, process obligations, cost recovery mechanisms etc.

ACTION – (2) Tjaart to organise an ad hoc meeting to discuss the progress of REZ modelling presented by AEMO.

7 WORKING GROUP UPDATES

7.1 NEM EMERGENCY COMMUNICATIONS WORKING GROUP (NEMEC WG) *HARMOHAN SINGH*

i. UPDATE – NEMEC WG

Harmohan provided an update, as per the NEMEC WG submission in the meeting pack.

ii. Responses for the Long Haul and Short Haul Communications roadmap

- Long Haul Communications – In 2020, the vendor provided a quotation, so the NEMEC has requested an update on that as it is outdated. The Commonwealth has expressed its interest in funding two high frequency radio systems for the trial and are seeking approval from the Energy Minister. They will advise a response by the end of September.
- Short Haul Communications – The NEMEC Working Group is working through the requirement and discussing options. It is envisaged that the roadmap will be finalised by the end of 2023.
- Tjaart advised that AEMO Controllers will be contacting TNSPs to discuss what happens in the event of a System Black, when it comes to communications, what do we do?

7.2 POWER SYSTEM SECURITY WORKING GROUP UPDATE (PSSWG) *DARREN SPOOR*

i. UPDATE – PSSWG

Darren provided an update, as per the PSSWG submission in the meeting pack.

ii. Member Discussions and Questions

- Regarding human errors, as discussed during Zander's presentation. This showed the percentages of human error causes versus not and Michael spoke about looking at it from a controlled risk perspective. Is that recorded as a risk and what controls are in place. This can be a starting point for the PSSWG to have a holistic overview of control of the risk. Bowtie controls and response times are important, however the actions that are to be taken post event need to be established and categorised at a high level, to inform the NEMOC further.
- This may need to be considered by both the PSSWG and OPWG in the context of planned outages. Darren will discuss with Sujeewa and advise the NEMOC.
- Darren was asked to discuss the highest priority for the PSSWG – Managing the Bushfire reclassification framework prior to summer. The next highest priority would be protocols for loss of communications, which it is hoped to be resolved by February 2024.
- The idea was raised that it would be interesting to examine a collection of incidents and work out how many have been addressed with engineering controls and how many have been addressed with administration controls. It is

easy for reviews to force the easiest control to be implemented, which includes training or rewriting procedures, as opposed to something more costly but potentially more preventative engineering controls.

- SO_OP_3715 and the Wind vulnerable lines table that was added to the addendum was discussed. The lightning vulnerable lines table required updating each time there was a lightning strike and 3715 then required republishing each time there was a change. The table has been removed from 3715 and can be individually updated as required without the need to republish 3715.
- Industry feedback shows that participants need to know what probable action AEMO will take in certain conditions. Under the NER, AEMO is obliged to notify participants of abnormal conditions and reclassification. It has been decided that the standard will become that AEMO will provide a warning that we are going to or may have to reclassify and invoke the necessary constraints as well. Holistically, the solution is to include the actual lines that we would do this for, in the same vein as AEMO does for lighting.
- Members were asked to consider if there were any objections from any TNSPs to have those lines listed in that document, knowing that it is a public document.

ACTION – Darren to speak with Sujeewa about human error and controls, to decide if this should be considered by both the PSSWG and OPWG. Darren will report back to the NEMOC.

7.3 OPERATIONS PLANNING WORKING GROUP (OPWG) *SUJEEWA RAJAPAKSE*

i. UPDATE – OPWG

Sujeewa provided an update, as per the OPWG submission in the meeting pack.

ii. Member Discussions and Questions

- An industry challenge that requires solving was discussed on the topic of outages, strength equations and the studies that need to happen for all the different combinations and permutations of generator lines in, things out. We need to get a more efficient way in the operation space of modelling it because we are doing the due diligence path that we know today and that we are doing the PS CAD modelling, it's very effective and it's the most accurate. The question asked, is that the level of accuracy we need for operations? For three-hour outage is that what we need? To make the network efficiently operate, fleets of people will be needed to do these studies that do not exist in the market today.
- We certainly need to have resource plans across our industry. Alternatively, we need to collectively come up with an effective way that we're comfortable that gives us the right technical outcome that maybe is not to the level of a connection agreement verification level study.
- Then there's a challenge that also on the complete polar opposite side of it. An opportunity to look at how we can do that in the more dynamic way, but also leads to more dynamic constraint management that leads to unlocking more availability on the network.

7.4 POWER SYSTEM MODELLING REFERENCE GROUP UPDATE (PSMRG) *RAJESH NIGHOT*

i. UPDATE – PSMRG

- Rajesh provided an update, as per the PSMRG submission in the meeting pack.
- Importantly, it was noted that a subgroup and a taskforce be created. The subgroup is related to DER and composite load modelling. The taskforce is for the migration of NEM models from PSC version 34 to 35 or 36. The taskforce will investigate and recommend whether it will be easier to migrate to version 35 or version 36. The subgroup and taskforce will report to the PSMRG.

ii. Member Discussions and Questions

- Rajesh was advised that the PSMRG will need to work with Sujeewa and the OPWG in the context of outages, strength equations and the studies that need to happen for all the different combinations and permutations of generator lines in, things out. We need to get a more efficient way in the operation space of modelling it in advance.
- A question was asked about the work the subgroup is doing on the DER and load NEM model development, what is the upper limit megawatts sizing that is being discussed, anything that is not registered?

- 4777 Inverter compliance is one of the activities they are covering as well as validating any of the model that is connected to the distribution network.
- The space between 5 and 30 megawatts. AEMO currently has a consultation on changes to the threshold for AEMO advisory services. DNSPs are concerned that raising that level to 30 megawatts for AEMO advisory services opens up the gap that we already see in the sub 5 Meg space, particularly in terms of model accuracy and PSMRG.

ACTION – Rajesh and the PSMRG are to work with Sujeewa and the OPWG on a more efficient way in the operations space, of modelling outages and report to the NEMOC on their progress at the next meeting.

7.5 OPERATIONS TRAINING WORKING GROUP (OTWG) *DANIEL LAVIS*

i. POWER SYSTEM OPERATOR TRAINING FRAMEWORK (PSOT) – PILOT PROJECT

- Daniel provided an update, as per the OTWG submission in the meeting pack.
- An introduction was also given for the internal AEMO Operations Academy Program, sponsored by Michael. An opportunity to try and develop some operational skills outside of our control rooms. Nine participants were chosen to undertake. We are about midway through and they are moving through a range of control room, skill sets or competencies, similar to what a new starter within our control rooms would undertake.
- As well as working through a series of workshops every fortnight, we get an SME either from within the control room itself or outside of the control room to talk on a specialised topic and the aim is at the end of this program is that AEMO have a number of new, very skilled up staff that can support our control room at any time as well as have the potential of moving into the control room if that is part of the career opportunity they are looking at.

ii. Member Discussions and Questions

- Jennifer advised that she is available as a guest speaker from a TNSP. This was gratefully received and it was requested that Jennifer support the coordination of TNSP site visits by trainees.
- Daniel was asked if he could share the Constraints Masterclass module and provide an overview of the module, as well as what we could learn from the current gas training.

ACTION – Daniel to share the Constraints Masterclass module and provide an overview at the next NEMOC meeting, along with what we could learn in terms of current gas training programs.

8 SAFETY

- No safety issues were discussed.

9 GENERAL BUSINESS

- Michael requested that if there is an out of session meeting, that members revisit the Charter to see what members like and if they want something different. It is a good time for a refresh, while we set the forward thinking for the next 12 months and we need to be conscious that our thinking proximity to the reform agenda is really important. If that is something that should be incorporated further into the Charter, it should be considered.

10 MEETING CLOSE

- The meeting closed at 12.15pm.

NEXT MEETING / WORKSHOP	DATE
NEMOC MEETING No.34	10am – 1pm AEDT Thursday 7 December 2023 (AEMO Norwest Office – Lithgow Room, Level 1, 2-4 Elizabeth Macarthur Drive, Bella Vista F2F)