MINUTES - DRAFT

MEETING:	Control Room Operations Working Group (CROWG)
DATE:	Thursday, 22 April 2021
TIME:	09.00am – 12.00pm
LOCATION:	Via Teleconference / Microsoft Teams MS Teams Meeting
TELECONFERENCE DETAILS:	Join Microsoft Teams Meeting +61 2 8318 0090 Australia, Sydney (Toll) Conference ID: 884 698 85#

ATTENDEES:

Name	Company / Department
Alan Jenkinson	AGL Loy Yang
Aren Sears	SA Power Networks
Bashar Derbas	AEMO
Caroline Ferres	AEMO
Christopher Migocki	Ausgrid
Daniel Lavis	AEMO
Darren Spoor	AEMO
David Gray	Energy QLD
Doug Deans	ElectraNet
Duane Brooks	ElectraNet
Edward Sellwood	Powerlink
Geoff Cook	TransGrid
Joo Ean Prasad	Ausgrid
Kerri Slatter	LoyYang A Shift Mgr/Ops Superintendent
Leanne Maurice	Powerlink
Malcolm McNicol	AEMO
Mario Rositano	AEMO (Chair)
Michael Paine	Snowy Hydro
Paul Clark	LoyYang A
Phil Gay	Ausnet
Russell Gordon	Energy QLD

APOLOGIES:

Name	Company / Department
Ali Walsh	SA Power Networks
Anthony Ham	CS Energy
Bradley Shipp	TransGrid
Brenton Medlin	AGL
Brett Harrington	Energy Australia (ECOGEN)
Brett Wills	Origin Energy
Chad Thompson	Origin Energy
Colin Sharp	TasNetworks
Colin Taylor	ElectraNet
Corney Matthew	Powerlink
Craig Flanigan	Energy Australia (ECOGEN)
Darrell Blackford	Territory Generation (NT GOC)
David Elkington	Loy Yang B
David Molla	Energy Australia
Duncan Griffin	Powerwater

Name	Company / Department
Elizabeth Beavis	Stanwell
Garry Paterson	AGL
Gayle McAllister	Energy Australia (Yallourn)
Grant Matherson	AGL
Greg Dale	CS Energy
Henry Rich	Delta Electricity
Ian Fergurson	Powerwater
Ian Swift	CS Energy
James Mortimer	APA
Ken Wilby	Endeavour Energy
Leylann Hinch	EVO Energy
M Greenaway	CS Energy
Mark Pollock	AEMO
Martin Cavanagh	Ausnet
Matt Donaldson	Essential Energy
Matthew Sands	CleanCo QLD
Matthew Turner	EVO Energy
Matthew Wikman	AEMO
Mike Griffiths	Origin Energy
Neil Grigg	Energy Australia (Yallourn)
Nikki Barbi	Energy QLD
Paul Elliott	AEMO
Paul McNamara	AGL Macquarie (Bayswater)
Peter Moretti	Energy Australia
Rob Krueger	APA
Robert Armstrong	Endeavour Energy
Robert Chapman	Origin Energy
Rod Joyce	Endeavour Energy
S Burge	Intergen
Simon Bolt	Delta Electricity
Stephan Laucht	AGL Macquarie
Steve Saunders	Powerlink
Tim Gray	ElectraNet
Wahid Ibrahim	EVO Energy

1. Welcome and Introduction

1.1. Roll Call was taken.

Apologies accepted from various members who were unable to attend

1.2. Purpose and objectives of today's CROWG meeting

Main purpose and objectives for today are to:

- Continue discussions on some of the topics that were raised in the last meetings and provide updates on where work stands.
- Introduce and explore new topics.
- Share ideas and experiences and matters that relate to our work in the control rooms. Share opinions, insights, etc.

- Improve control room operations and relations in the NEM as per the TOR.

1.3. Introduce any new members/guests

Welcome to new CROWG member, Matt Donaldson (Essential Energy) – taking over from Ed Selwood who has moved to Powerlink and Aren Saers (SA Power Networks).

2. Minutes/ Actions

2.1. Previous meeting minutes

Minutes were accepted by Russell Gordon

2.2. Updates to actions register made

Refer to actions register for details. Items 4, 6, 7, 9, 11, and 12 were actioned and are now closed. No further comments from the group.

3. Electricity Industry Terminology and Phraseology

Following the last CROWG Meeting in mid-October 2020, a second EITP subgroup meeting was held in late Nov 2020. The group consists of members from all regions with representatives from AEMO, TNSP's, Distribution and Generators. Special thanks to all members for their contributions.

- Meeting minutes have been circulated to the group.
- Primary focus has been to complete the System Restart Terminology and Phraseology spreadsheet which has been commented on and subsequently consolidated. It is almost complete except for a few terms requiring agreed definitions.
- Document has been forwarded to all CROWG Members for comment. Consensus from the group required before sending out to wider group.
- The group began looking at Time Critical/Emergency Events. Similar to the restart process, the intention is to follow on with terminology and phraseology for emergency and time critical events. Important to include the terms that would be useful in these instances as well. This is work in progress. Group also looked at:
    - timeframes/outcomes
    - NEM participant vs Operational terminology
    - Use as a training tool capturing the various nuances – don't want this to dilute terms or lose their historical background. A great starting point/guide for those new to the NEM (overseas, connection assets, etc.)
- Had planned to meet again prior to this meeting, but not possible. Intend to meet in the next month ahead of the next CROWG meeting.
- Comments from the group regarding the information that's been passed on:

  DB – had input from ElectraNet, Generators, etc. Just trying to concentrate on System Restart to start with.

  MM – What mechanism are we going to use to keep this document up to date, particularly with regards to scripts which do constantly change? Living document.

  DS – Intend to publish a working group paper for public consumption which would include this kind of Phraseology and Terminology information. Could feed into the competency framework for controllers.

Action: MB to finalise the CROWG – System Restart Terminology and Phraseology spreadsheet and send out for endorsement. Put forward a mechanism to keep document up to date.

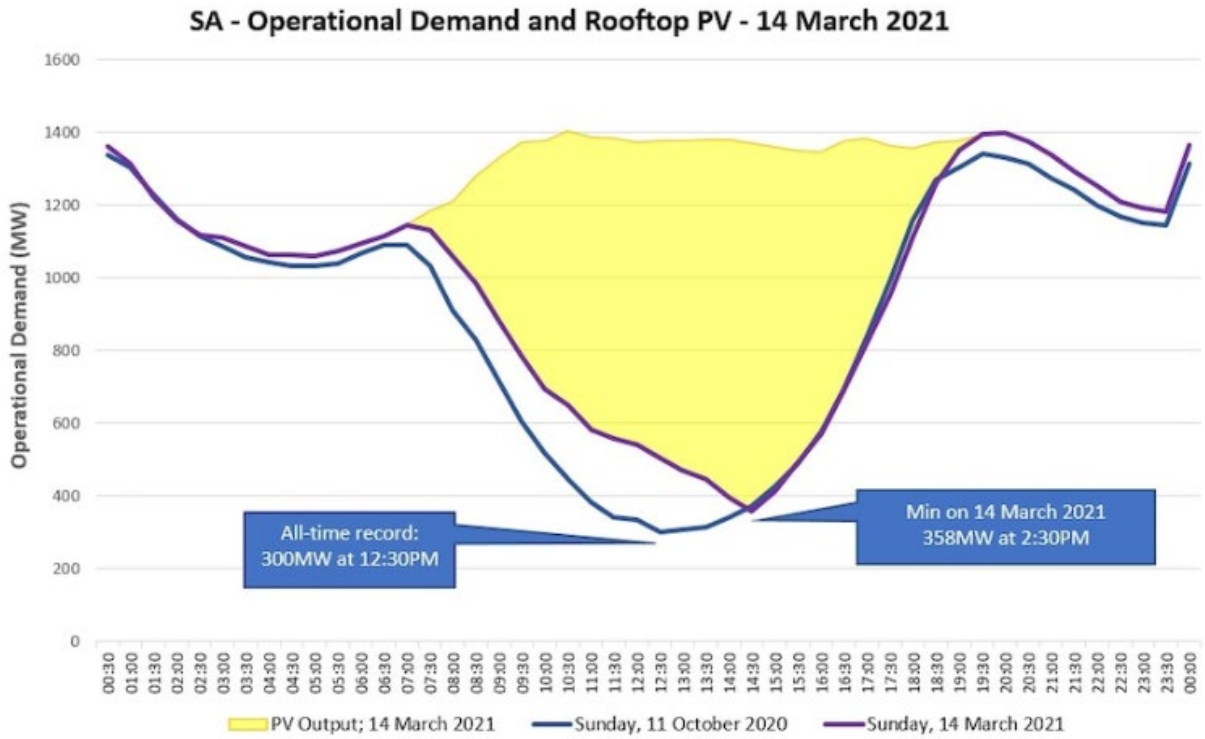
4. Managing DER in NEM

4.1. Update from SA Power Networks re tests performed in February

- SA Power Networks conducted a 'fire drill' on 12 February 2021, to trial the disconnection of Smarter Homes PV and the activation of a small number of sites with Enhanced Voltage Management. Saw a curtailment of approximately 20MW of PV on the SA System. The timing of this test was a surprise to the tech providers and to key internal SAPN resources as SAPN was testing the procedural and technical interactions of these programs. The test was closely managed to ensure that only the intended test systems were activated but involved the disconnection of real systems and the raising of voltages at the three sites that had been trialled previously. AS – nothing bad there. Appeared OK.

4.2. AEMO recent instruction during low load period

- On 21 March, 2021 we had a low load day in SA - one of the VIC to SA lines (part of the interconnection) was down and the load was trickling down. It got to a point where we had to instruct ElectraNet to speak to SAPN to maintain the SA Operational Demand above 400MW which meant taking out PV. The official wording of the instruction as per the Market Notice stated this was necessary "to maintain a secure operating state' and action was required 'to maintain distributed PV generation to a secure level to avoid a system security issue caused by low demand during the specified period (around 2:30pm on 14 March 2021)"



A graph showing the plunge in electricity demand in SA on Sunday. *(AEMO)*

- AS (SAPN) - Used the Smarter Homes application through the Whisper program which told the PV to switch off around 2:50pm and then at 3:05pm enacted the EVM to raise the voltage at the substation. When the voltage comes down again the PV turn themselves back on.
- DG (Energy QLD) – what sort of voltage did you go to? Have had some 'poor attitude' from PV where they've adjusted the voltage up. AS said that they can get to the 260 V mark.
- Please see link to the ABC article mentioned in the discussion explaining what AEMO did:
    - https://www.abc.net.au/news/2021-03-17/solar-panels-switched-off-in-sa-to-stabilise-grid/13256572

5. Summer Review

5.1. Update from members

TNSPs:

GC (TransGrid) - Very mild conditions. Bit of a non-event. Didn't have fire issues or major weather events. Did have high winds event that brought down a line which was dealt with. Were able to keep doing daily site work and work on the QNI upgrades. High volume of project and maintenance work.

PG (AusNet) – Very mild summer. The low load days with high PV were problematic. Commissioning WF and SFs.

DB (ElectraNet) – Fairly non-eventful summer. Low load days on Sundays where the weather was out and the PV was high caused us the most concerns and issues. Event involving Tim Gray (TIPS fire).

LM (Powerlink) – Wet conditions in the Northern part of QLD. Nothing exceptional this year. Even low loads over the long weekend over Easter. Nothing to report.

DNSPs:

DG – (Energy QLD) – Quite mild weather. Couple minor wind gusts. Overall, pretty quiet. Capriconia, one of the old Ergon regions, had a peak load this summer went from 745MW to 804MW on 22/2/2021

JEP (AusGrid) – Had a couple of weather events but nothing much from a load perspective.

AS (SAPN) – Pretty mild summer here as well. Nothing to report from our point of view.

Generators:

AJ (AGL) – The summer we didn't have. With COVID and the mild summer we were backing off overnight again. Absorbing a lot of VARs overnight.

MP (Snowy) – Made room in the dams thinking it would be a wet summer but that never happened. Two thirds of our inflow come in during the snowfall. Run off debris following on from the fires is a continuing issue until vegetation comes back (ie: branches and trees running off into and blocking dams during periods of rainfall).

Other comments re Summer Review:

MM (AEMO) – raised vegetation control/controlled burns on mild days – what is everyone considering for the year ahead? AEMO don't get a lot of information about these sorts of things. For interest sake, be good to know. Participants commented that they don't necessarily get this sort of information first-hand either. Is planned and happens in the 'back-rooms'. Believe that normal/usual plans are in place.

6. COVID-19

6.1. Update from members

Interesting discussion previously. Plan to get vaccinated for COVID and flu. AEMO Control rooms are back to normal. Brisbane was split briefly for a few days with the latest outbreak. Good test of our systems. Some control rooms have now implemented some permanent changes.

PG (AusNet) – we're not deemed 'essential services' so we'll be waiting for eligibility to get vaccinated with public groups. Split control rooms.

DD (ElectraNet) - Have had to make a submission and move the priority up for controllers to get vaccinated. Won't be moving back to the main building until everyone has been vaccinated.

PG (AusNet) – Staying split until everyone has been vaccinated

GC (TransGrid) – Always been split

LM (Powerlink) – Just come back this week with strict protocols (sanitising, no visitors, wearing of masks is mandatory, etc)

JEP (AusGrid) – still running four rooms. Looking at bringing it back to two. Need the space to run the system in parallel for ADMS project purposes (not due to COVID)

DG (EQL) has been deemed eligible for the vaccine with group 2A. I in the North, 1 in the South and 2 in Brisbane. Looking to consolidating back to 2 in the next 3 – 4 months.

PC (LoyYang A) – Pretty much back to normal. essential access only for people other than operations. Wear a mask in a lift and car.

MP (Snowy) – Things are back to normal. Will continue to have two control rooms work from both or either/or.

7. Communications

7.1. Update from Darren Spoor on SRAS Communications Protocol status

Final draft of the SRAS Communications Protocol was provided to the group as part of the consultation process. As you know from previous CROWG meeting minutes, the NEMOC has been tasked with this by the AEMC to address a Rule change. CROWG provided final comment for endorsement by 22nd February.

- Update from Darren on where we stand with the SRAS Communications Protocol:
    - Document signed end of March and published a few weeks ago. Hasn't changed at all since the CROWG last looked at it. Document is available on the website. Note clause regarding testing under 4.2. This is a compliance requirement that all of us will have to meet.

4.2. Availability and Testing of Emergency Communications

All primary communications links between AEMO and the Restart Participant should be available for at least three hours following a loss of electrical supplies within the NEM.

The provision of backup communications links should be considered as a means of reinforcing the availability of communications between control centres. These backup systems can include dedicated PSTN, backup OTN links or terrestrial radio systems.

Emergency backup communications links must also be available between AEMO, NSPs, and *SRAS Providers*. These emergency communications links should provide an availability of at least 12hrs standby, with 3hrs talk time.

Testing of all operational telephony systems should be conducted at least once every 6 months, with remediation of any observed defects in accordance with the following table. Testing requires a coordinated check of the connection and quality of operational voice channels, where the results are retained for at least 12 months following the test.

Communications Links Between Control Centres	Remediation Requirement
Primary Operational Telephony Link	24 hrs
Backup Links	7 days
Emergency Communications Link	28 days

4.3. Emergency Communications Plan

All Restart Participants must develop an emergency communications plan which defines which communications systems are available, the priority order for utilising these communications and an agreed protocol for when these communications services will be utilised, or turned on.

- The System Restart Communications Protocol document is available on the Power System Operations page of the AEMO website:
    - https://www.aemo.com.au/energy-systems/electricity/national-electricity-market-nem/system-operations/power-system-operation#:~:text=AEMO%27s%20system%20operating%20procedures%20are%20developed%20primarily%20for,Market%20%28NEM%29%20and%20security%20of%20the%20power%20system.

8. Texas Power System Event

Record cold snap. Record high average demand. At 1:15 on Feb 4th, nuclear plant had to shut down, thing

- Looked at the presentation and referred to the following podcast:
    - https://www.wsj.com/podcasts/the-journal/why-the-texas-power-grid-failed/B08E75E7-5FAC-4777-B796-49D5CE519977
- Darren Spoor, AEMO, shared the following observations from the PSSWG/CROWG discussion on 15 May, 2021:
    - JSSC's to understand the limitations of the rotational load shedding during large load shedding events

- Confirmation of equitable load shedding requirements by NSPs (Clause 4.8.9(i)).
- Difficulties in achieving UFLS to achieve 60% due to distributed rooftop solar.
  - Being resolved in SA through joint discussions with AEMO. Includes the:
    - exclusion of the feeders that become 'net generators'
    - The use of dynamic arming within 'load applications'
    - Moving UFLS groups to specific customers on the distribution feeder
- Manage the expectation of customers.
  - Endeavour Energy is asking some HV customers to rotate internally through a 'rationed' load allowance. However, these customers refer to payment available in contracts with their retailers. There is a need to educate customers on their obligations for supporting system security, rather than for simply economic scaling
- System strength may be impacted if load shedding is required due to the unavailability of synchronous generation. This may, in turn, lead to further renewable generation curtailment, and further load shedding.
- A need to consider dispatchable load, such as hydrogen production (provided after the meeting)

- Can control rooms learn anything from this event? Comments shared:
  - CM (AusGrid) – Difficult to do this (rotational load shedding – ideally 2 hourly) on our SCADA systems
  - PG (AusNet) – new Schneider EMS system will have much more capability in this space.
  - JEP (AusGrid) – will need the new EMS
  - MP (Snowy) – ROC rates we have allow us to move generation fairly quickly. Systems are designed to handle cold weather so don't really see any issues there. Cold weather isn't really a problem most of the time. Really hasn't been a time when things have been that cold that things stop working.
  - PG (AusNet) – Niece in US experienced cold weather outages in Texas and Chicago. No communication about how long power would be out for. No rotational load shedding. If you didn't have a hospital on your feeder, power was off the whole time.

9. Voltage Control

9.1. Update on AEMO VDS and related issues following on from the last meeting

AEMO Operations have conducted a review of VDS and has had a bit of a reset. Key outcomes from the meeting on 22 March 2021 were:

- Regular meetings to occur every 2 months
- Updates have been made to the VDS User Manual (SO_UM_31).
- Created a VDS Teams Group chat for the control which is incredibly effective.
- General push to tune the system more and chase up on any lingering issues.

Would like to hear from generators and TNSP's from a voltage control point of view and hear how the VDS is performing. Are there any improvements they'd like to put forward for discussion?

- PG (AusNet) – Doesn't look at PV coming in in the morning and going out in the afternoon. Big issue in Victoria. Just doesn't work.
- PC (LoyYang A) – getting requests for TAPS outside our capability curves usually absorbing.

There was an action item to have some sort of VDS reboot meeting with participants. Want this to happen but want to get 'our side of the fence' straightened first before moving ahead with this.

Action: MR to organise some kind of reboot of the VDS project/working group to sort out some of the issues and provide a forum to obtain feedback and conduct Q&A. (Andrew, Alan Jenkinson, Phil Gay, Mario, etc)

10. Control Room Technology and Ergonomics

Present day to day requirements, BAU, budgets, timelines and resources don't seem to allow or support the kind of development/innovation in this space that may have occurred in the past. Control Room Technology and related Ergonomic issues really don't sit high on the priority list. And "if it ain't broke, don't fix it" type of attitude seems to prevail. This working group has a unique opportunity to tap into each other's experiences in control rooms and perspectives on what works, what doesn't, etc. A lot of information is available online. From, LED video walls, AI & machine learning, how to handle enormous amounts of data, information & data visualisation, display technology, situational awareness, sound communication technologies, operational risk, collaboration, industrial internet of things, decentralisation, health and safety and much more.

- Some relevant links:

  https://russbassett.com/5-trends-in-control-room-furniture-and-technology/
  https://www.intertraffic.com/news/traffic-management/control-rooms-of-the-future/
  https://www.mauell.com/control-rooms-of-the-future/
  https://www.controleng.com/articles/next-generation-control-room-technologies/
  https://www.barco.com/en/news/2020-05-25-5-key-trends-in-control-rooms
  https://acrna.org/ (Australian control room network association)

10.1. What are the latest upgrades, ideas, proposals, projects, etc

System restart 4-way communications test

10.2. What currently works and what issues have been experienced

Not having the video link between control rooms was a real disadvantage during a recent event in SA (TIPS fire). Worth discussing as many of the control rooms are split (AEMO, ENSA, PLQ, TG). The comms screen link really gives the team chance to focus, gather required info, share, discuss ideas, and action tasks. Discussed what other control rooms are doing in this space. Shared experiences and talked about what seems to work and what doesn't:

- JEP (AusGrid) – We have MS Surface Hubs at each end of our CRs so we can turn on the video link but it is very rarely used because it's not a permanent fixture. There's also a view that when the camera is on, controllers are being 'spied on'.

- MM (AEMO) – We also use Surface Hubs. Our issues are more around getting the IT up to standard. Concur with your observation that CRs have this perception that they don't like to be 'spied on'. The Surface Hubs is in the room but not necessarily overlooking the intimate work area. The controller has to move a couple of metres to where the Surface Hub is actually located. It's actually better to go with a desk to desk approach. The less interaction (turning things on, going to places) the better. Person to person/links to each other is preferable. We're using Teams a lot more. On shift, we'll have a Teams link to each desk.
- ElectraNet – We've used Skype (no reason it couldn't be Teams) so that the person at the other end can have some understanding/awareness of where they're at. Shows the person from a side-on view. You can mute audio and/or turn the camera off. It's just for awareness mostly between individuals and it's up to the controllers' individual taste and preference.
- MR (AEMO) - Just having a laptop to communicate during training and while on the desk has been great.
- GC (TransGrid) – have a video connection between the two rooms to provide situational awareness and opportunity to have calls/conversations. Either end can mute it. Quite useful when training operators in the remote locations via video link.
- MR (AEMO) – A touch screen of the wallboard at the back of the Brisbane control room was a great tool for discussions on procedures, NEM and TNSP diagrams, etc and training. It's currently not working and is missed. Great training tool for those starting up (type of environment).

Consensus of the group was to keep this 'CR Technology and Ergonomics' topic as a running item so we can stay up to date with anything new that's occurring or any new technology that may be of use to us all.

11. Alarms

11.1. Update on Alarms work from members following on from the last meeting

Since last meeting there has been a real push from AEMO Control Room to get on top of their alarm issues. Latest is there have been significant number of alarms earmarked to be removed. This will help in the day to day operations in the control room.

- MM (AEMO) – our alarm review is geared towards reducing the number of alarms that we get. We've upgraded to EMP 3.2 and are going through the new platform and got the number of alarms down to 40,000 per week – about 1,000 of those are valid. We have limitations with the GE system.
- DB (ENet) – We've got an Alarms philosophy document outlining what they are, how they should sound and what a controller's response to them should be. New alarms have to be passed through an 'Alarms' committee. This is another way of trying to place controls on them. People keep coming up with new and unique names for devices. When we get our new EMS will take the opportunity to review
- MP (Snowy) – we've been through the exact same process but sounds like we're a bit further on. We've reduced the 'noise'. We created help files for each of our alarms (created templates) to help controllers with their response and what to do. Makes it easier for controllers. Trying to get down to 300 per day down from 9,000. It's a

continual never-ending process. Every device can have a lot of different points coming out of it. Have had to work hard to keep the nuisance alarms away.

  - This is the alarm standard that Snowy is using: https://cdn.standards.iteh.ai/samples/18329/7a4d54fdaac64122aa92dc4732fcec48/IEC-62682-2014.pdf

- PC (LoyYang A)– we have a person who is looking at Alarms, what's an acceptable amount of alarms, what can/can't a person manage (puts a bit of science behind it). Operational hygiene thing to define with what's reasonably possible for a person. It can be a flawed standard as some alarms take a lot more time (ie can be a whole day) to deal with or act on.

12. Other Business

12.1. Feedback

Please let us know if you have any input or feedback at any time.

12.2. Semi scheduled (one-off) dedicated meeting.

What's the best way to handle this? Would like to get them involved to show that there's involvement between the various control rooms. As part of our three meetings per year dedicate 1.5 hours to getting diverse number of WF and SFs into the meeting and discuss all things semi-scheduled.

PG (AusNet) – Be good to understand how their control rooms work. The changeover from the international people looking after it after hours to the local people during the day. That would be interesting to hear.

JEP (AusGrid) – Give it a try. Anything that improves communication would be great. Invite them in to 'show and tell'.

MR (AEMO) – Any issues from their side so we can get a bit more of an understanding of where they're coming from.

13. Next Meeting…

Check the climate for face to face meetings in July. Lightly pencil in a face to face meeting for November. Whatever we do is going to have to be a hybrid where people can dial in. Maybe use regional hubs so people don't have to travel interstate and join up the hubs via Teams/video link.

Meeting Forward Plan

Date	Host	Location
Wednesday, 21st July 2021	TBA	TBA
Friday, 19th November 2021	TBA	TBA