DEIP Standards, Data and Interoperability Working Group

Meeting 4 – 15 July 2020

Agenda

Item	Description	Time
1	Welcome and introductions	14:00 – 14:05
2	Actions from previous meeting	14:05 – 14:15
3	SA Operations report update	14:15 – 14:35
4	AEMO rule change request Update	14:35 – 15:00
5	AS/NZS 4777.2 Briefing	15:00 – 15:15
6	DER Device Standards – Taskforce Development	15:15 – 15:40
7	National API Working Group standards/guidelines progression	15:40 – 15:55
8	Other business	15:55 – 16:00
9	Meeting summary & close a. Agree actions b. Next meeting	16:00

Agenda Item 1:
Welcome and introductions

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We acknowledge the Traditional Owners of country throughout Australia and recognise their continuing connection to land, waters and culture.
We pay our respects to their Elders past, present and emerging.

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Competition Law Protocol: Our obligations

What you must do

Participants in AEMO discussions must:

- Ensure that discussions are limited to the matters contemplated by the **agenda** for the discussion
- Make **independent and unilateral decisions** about their commercial positions and approach in relation to the matters under discussion with AEMO
- **Immediately and clearly raise an objection with AEMO or the Chair of the meeting** if a matter is discussed that the participant is concerned may give rise to competition law risks or a breach of this Protocol

What you must not do

Participants in AEMO meetings **must not discuss or agree** on the following topics:

- Which **customers** they will supply or market to
- The **price or other terms** at which Participants will supply
- **Bids or tenders**, including the nature of a bid that a Participant intends to make or whether the Participant will participate in the bid
- Which suppliers **Participants** will acquire from (or the price or other terms on which they acquire goods or services)
- **Refusing to supply a person or company access** to any products, services or inputs they require

Under no circumstances must Participants share **Competitively Sensitive Information**. Competitively Sensitive Information means confidential information relating to a Participant which if disclosed to a competitor could affect its current or future commercial strategies, such as pricing information, customer terms and conditions, supply terms and conditions, sales, marketing or procurement strategies, product development, margins, costs, capacity or production planning.

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Agenda Item 2: Previous Actions

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Agenda Item 2 - Actions from Previous meeting

No	Action	Status
3.1	SDIWG ToR was approved, however members requested the following minor changes be made to update the taskforces membership to include: o Retailers and aggregators o CER o Consumer representatives	Complete
3.2	A) AEMO to identify if we can facilitate member organisations logo's on the SDIWG webpage by Friday 26 June. B) If this can be done AEMO will ask SDIWG members to provide approval or requirements for their organisations logos being used and published on the SDIWG webpage.	AEMO confirm logos cannot be supported on webpage. No further action.
3.3	AEMO to publish the SDI working group page on the AEMO website, with links to the ARENA DEIP and Standards Australia webpages by Friday 3 July	Complete
3.4	SDIWG members to advise if they require a briefing on the Initial DER Standard rule change proposal approach (prior to it being finalised and submitted to the AEMC) by Wednesday 24 June	Complete
3.5	SDIWG members to send through feedback for consideration on the information presented regarding the Initial DER Standard rule change approach by Friday 26 June	Complete

Agenda Item 2 - Actions from Previous meeting

No	Action	Status
3.6	AEMO to develop customer facing Q&A/FAQ on Initial DER Standard rule change for use in public consultation	In progress
3.7	AEMO to confirm whether metering requirements applies to all new meters or just meters connected for Solar/Storage by Tuesday 23 June	Requirements as part of the initial standard (to be consulted on) refer to DER that is newly connected or to be connected within a distribution system, or that is newly augmented, upgraded, extended or replaced. As such, this requirement will apply to all new meters connected.
3.8	All SDIWG members to advise organisational endorsement for the Battery Standard Proposal as presented by DNVGL by Wednesday 24 June	Draft letter of support for consideration
3.9	AEMO to finalise arrangements for the first Cyber Security Taskforce Meeting including membership now that the scope has been endorsed	First meeting likely to be held in August once resourcing for taskforce has been finalised
3.10	ENA to provide contacts for NSW cyber security activities to AEMO so we can ensure alignment with cyber security taskforce by Wednesday 24 June	Complete
3.11	AEMO to distribute the DER Device and Performance Standard Taskforce scoping definition document for feedback by Friday 3 July	Agenda Item 6
3.12	All members to review DER Device and Performance Standard Taskforce and send through feedback prior to next Working Group	Agenda Item 6

Agenda Item 3:
SA operation report update

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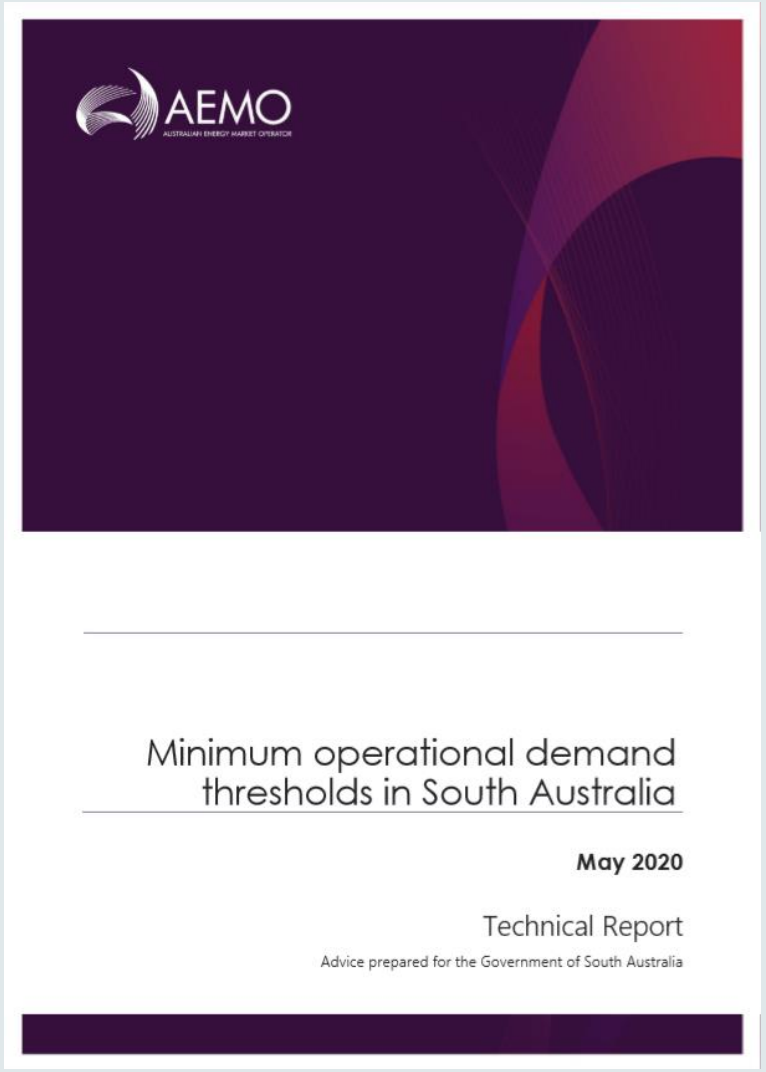
DER Integration

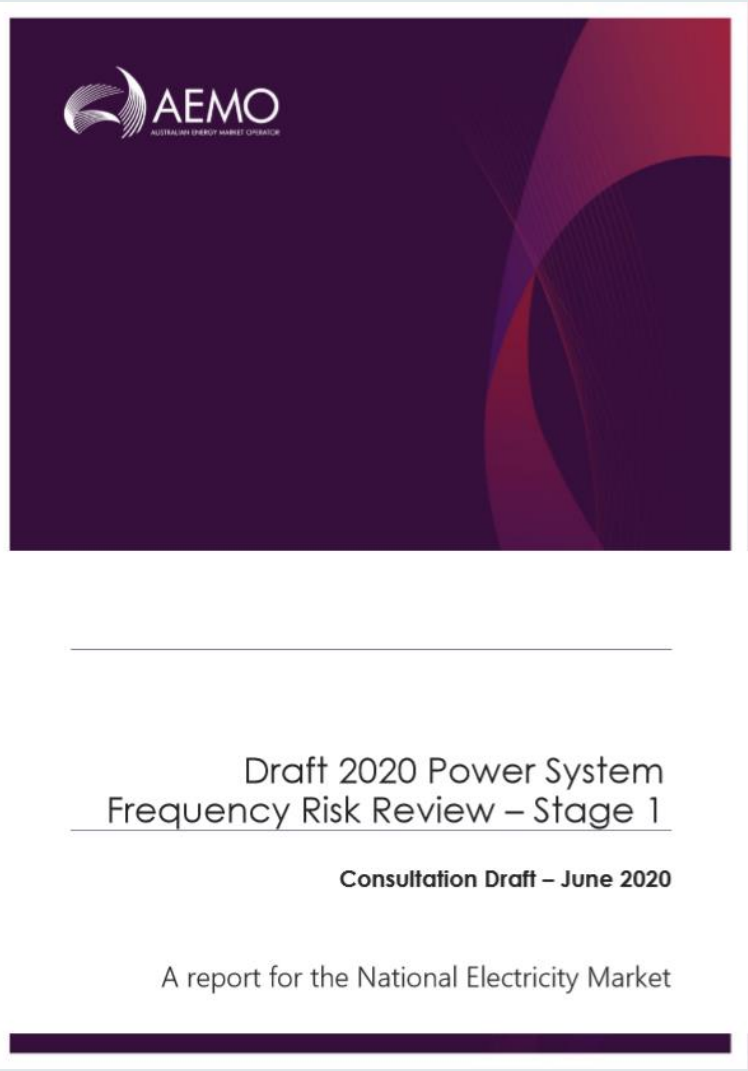
Emerging system security challenges in SA

Agenda

- DER program: Operations stream
- Preliminary findings and recommended solutions:
  1. Distributed photovoltaic (PV) disconnection
  2. Minimum load required to operate under islanded conditions
  3. Under Frequency Load Shedding (UFLS)
- Next steps and avenues to get involved



https://aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/sa_advisory/2020/minimum-operational-demand-thresholds-in-south-australia-review.pdf?la=en



Appendix A, at: https://aemo.com.au/-/media/files/stakeholder_consultation/consultations/nem-consultations/2020/psfrr/psfrr-stage-1.pdf?la=en

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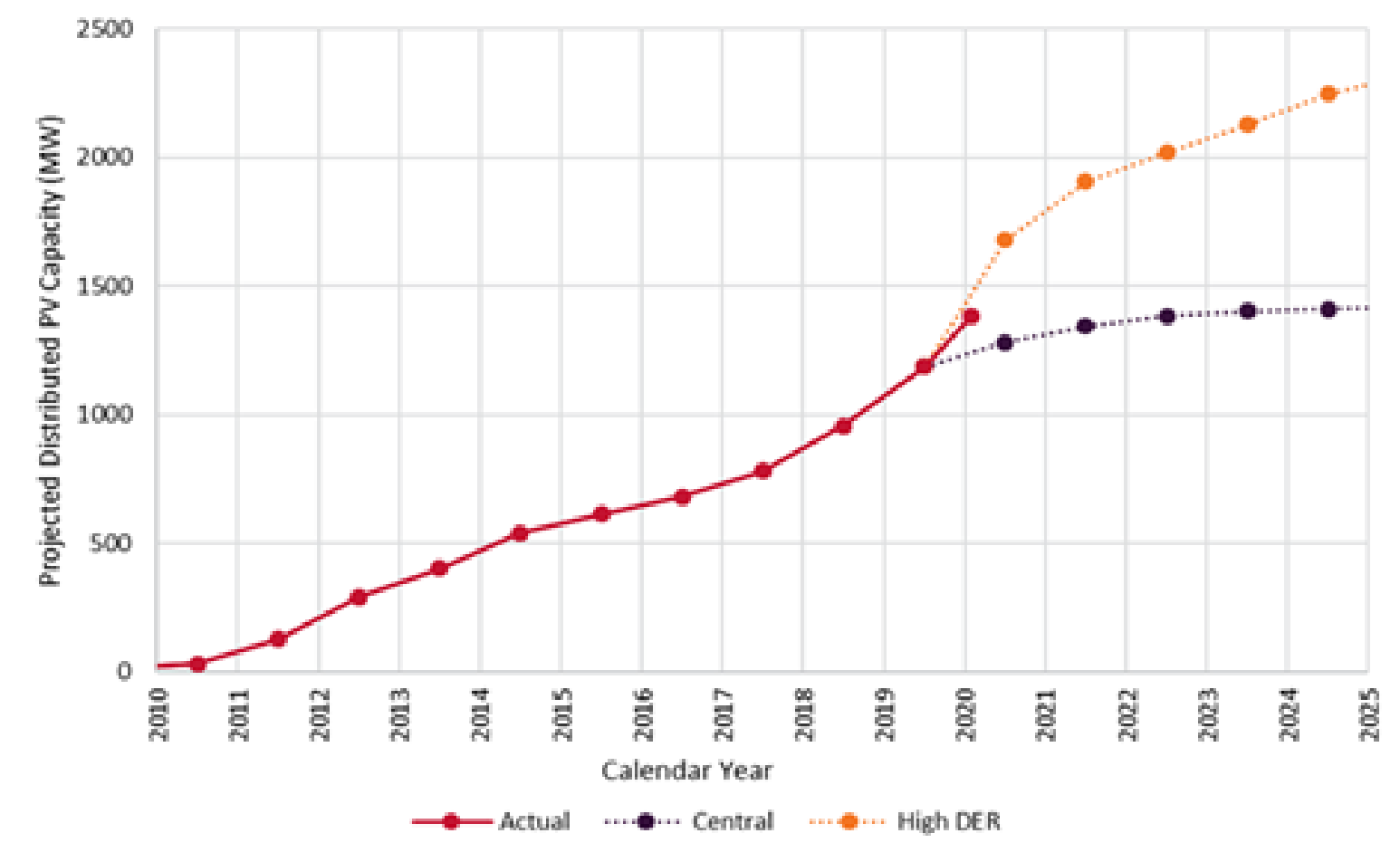
South Australia – DER integration

- "Consumer" power is the State's single biggest generator.
- Solar PV in SA currently has the capability to provide close to 1GW of energy under the right conditions.
- To put that into perspective, this already world-leading level of solar PV uptake increased by a record 219MW last year – which is equivalent to the size of one unit of the state's largest gas-fired power plant.

Actual and projected DPV capacity in SA



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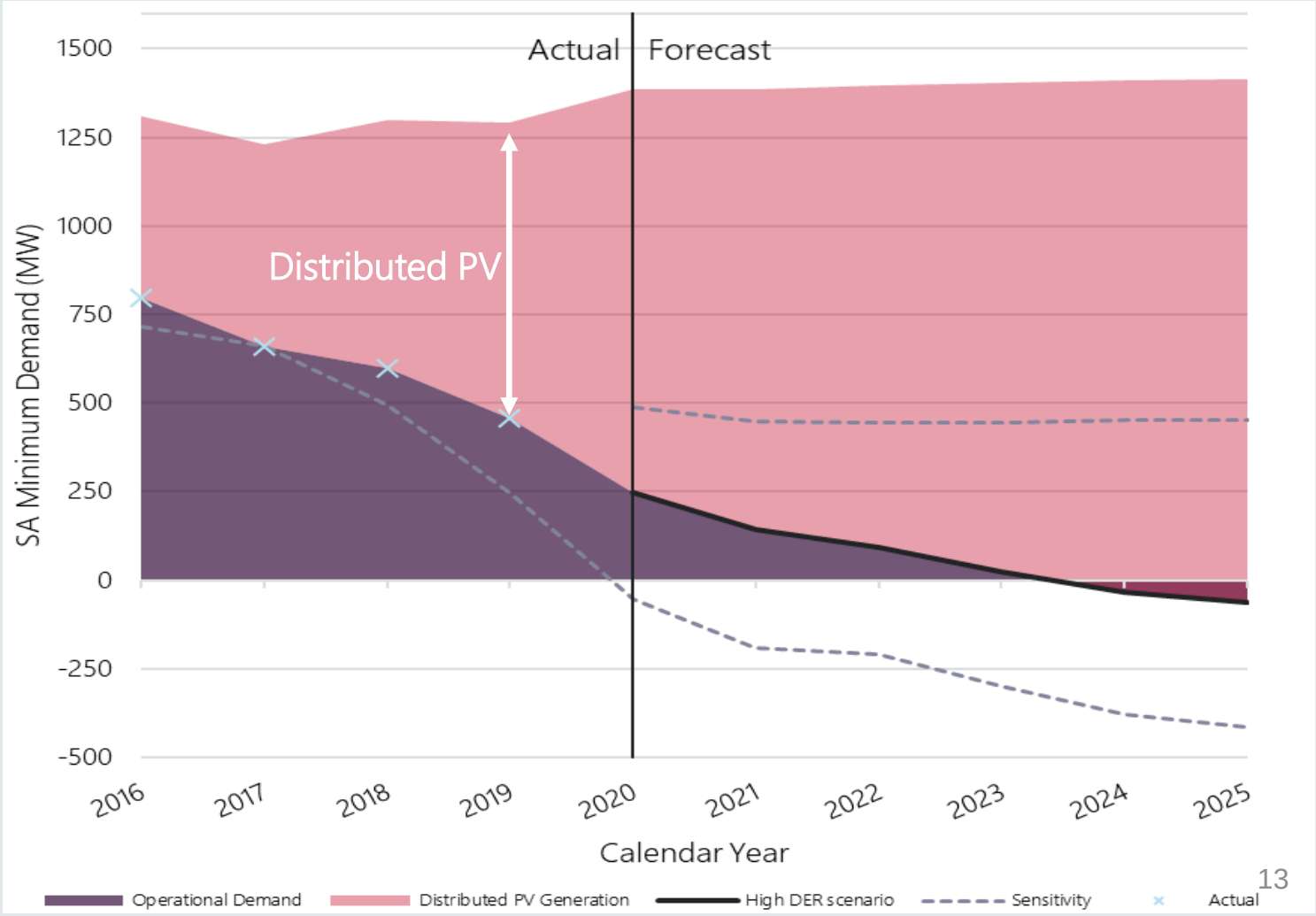
South Australia – DER integration

- Within 3-4 years, operational demand in South Australia could become negative.
- When and what operational challenges may arise?
- What actions do we need to take now, to ensure we can operate a secure system?
- Primary focus of DER Program Operations Stream

Minimum operational demand in SA



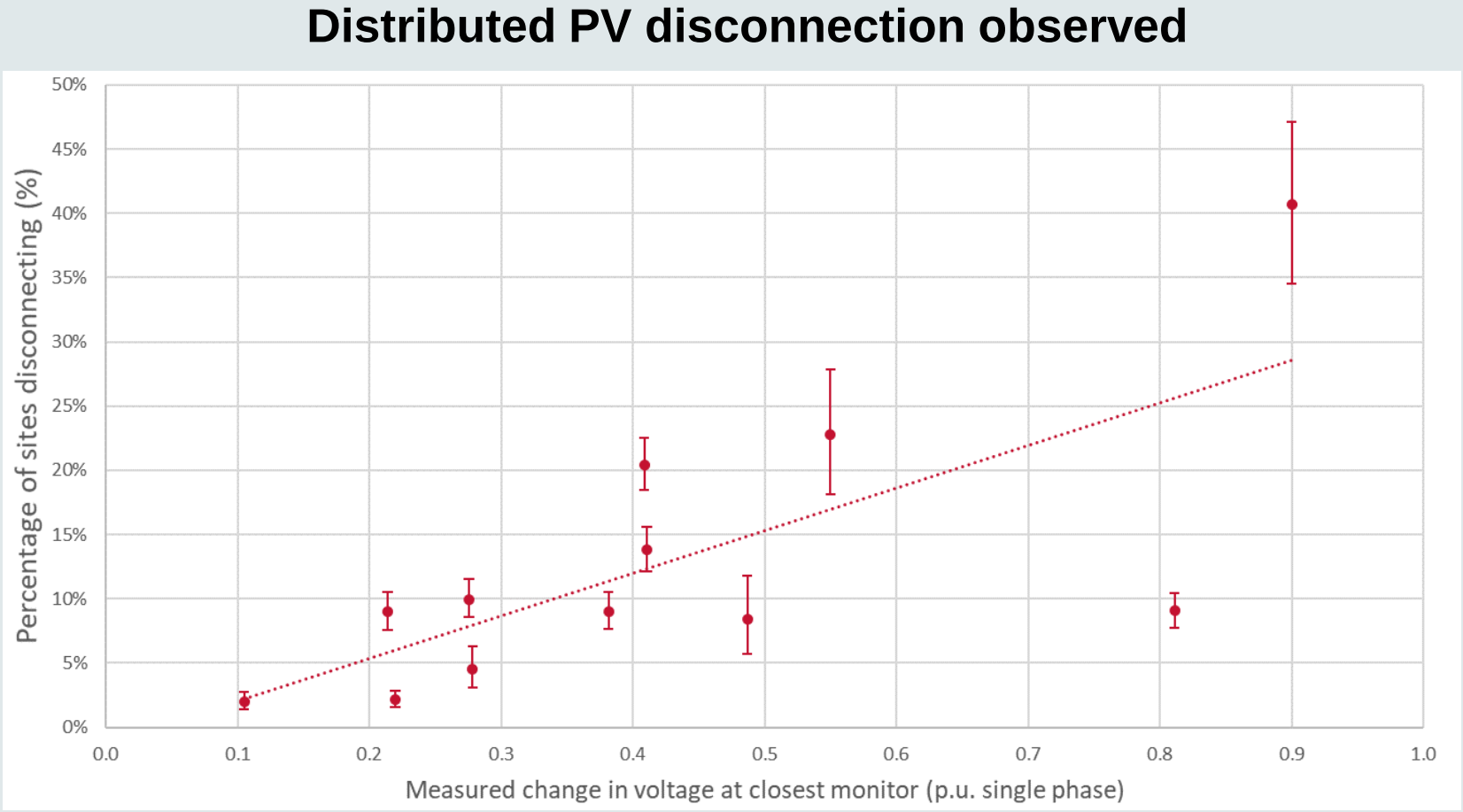
Preliminary findings

Challenges identified:

- Distributed PV disconnection
- Minimum load required to operate under islanded conditions
- Under Frequency Load Shedding

Distributed PV disconnection

- Analysis of PV disconnection based upon data from individual inverters
- Verified by bench testing (ARENA project with UNSW)
- Used to calibrate PSS®E model of DER behaviour
- PSS®E studies of a severe but credible fault in the Adelaide metropolitan area:
  - 14-28% of underlying load in SA disconnects
  - 49-53% of distributed PV generation in SA disconnects



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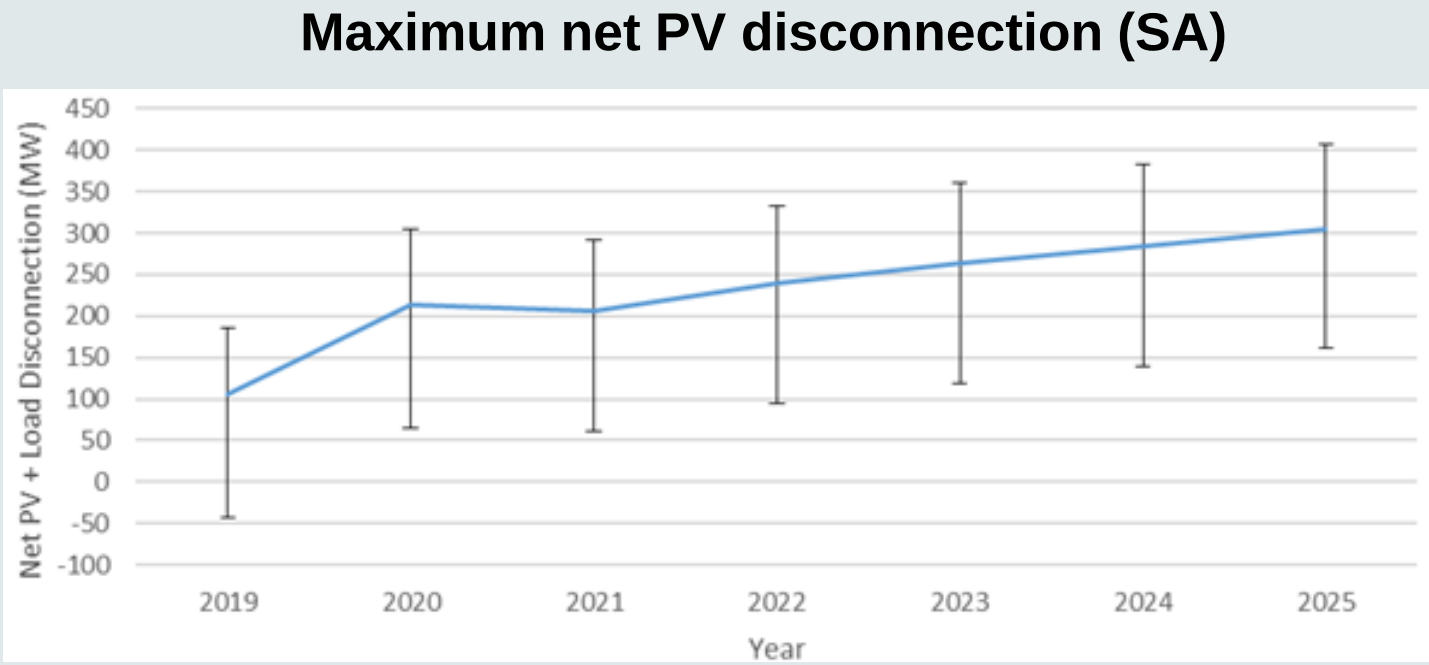
Distributed PV disconnection

- Severe but credible fault near Adelaide metropolitan area could cause significant disconnection of distributed PV
- Increases largest credible contingency
  - Added to largest generating unit
- Constraint introduced to manage risks of separation/triggering SIPS
- When operating as an SA island:
  - Becomes almost impossible to maintain frequency >49Hz when DER-load loss exceeds ~150 MW (may be operating in this realm in some periods already)
  - AEMO may no longer have the ability to operate SA in a secure state, if islanding occurs at times of high distributed PV generation



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Measures to manage PV disconnection

1. Improve DER standards (AS4777)
   - https://sapc.standards.org.au/sapc/public/listOpenCommentingPublication.action
2. Accelerated voltage ride through test in SA
   - https://aemo.com.au/en/consultations/current-and-closed-consultations/short-duration-undervoltage-disturbance-ride-through-test-procedure
   - DERProgram@aemo.com.au
3. Improve compliance with standards
   - DERProgram@aemo.com.au
4. Collaborate with DNSPs on connection requirements
5. EnergyConnect
6. Network constraints

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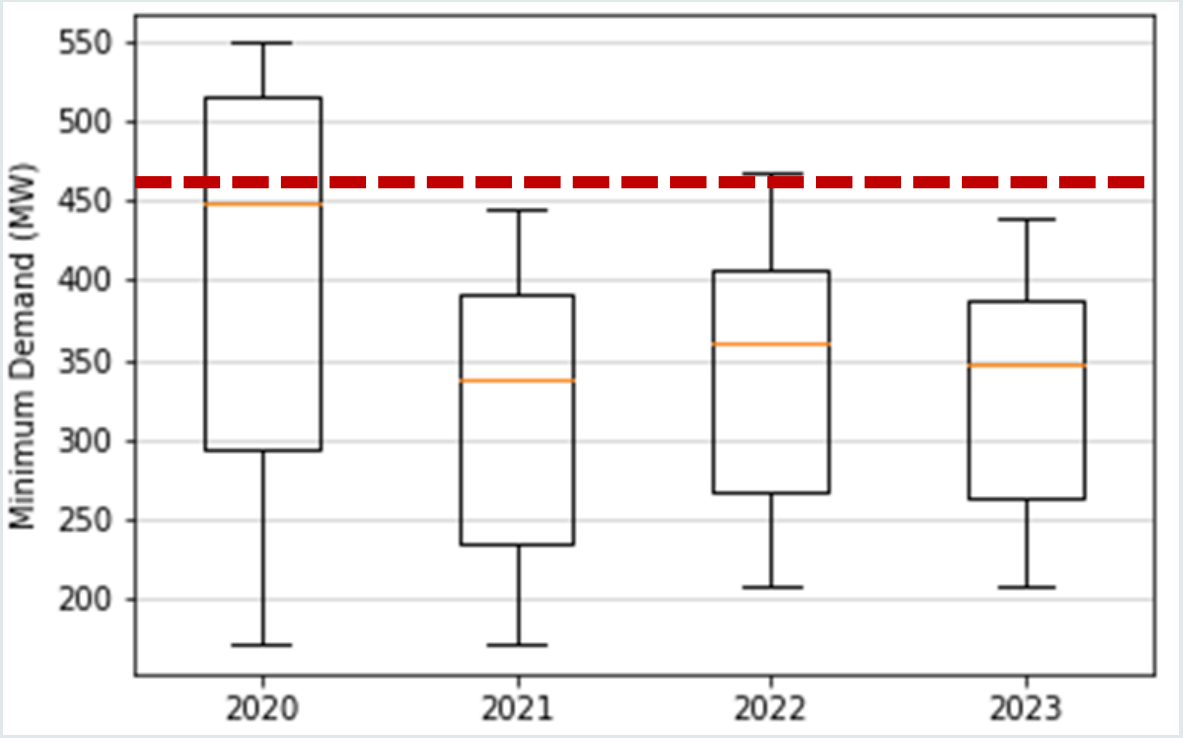
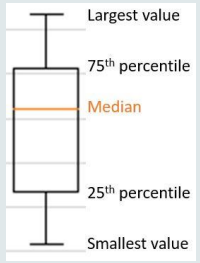
Minimum demand threshold

- **Islanded operation:** Need adequate load to operate necessary units for system strength, inertia, frequency control and voltage management
- Lowest operational demand experienced: 458 MW (10 Nov 2019)
- 2019 was a "moderate" year – minimum demand can become very low with:
  - Sunny
  - Mild temperatures, on
  - Spring/Summer public holidays

Minimum operational demand in SA





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Measures for islanded operation with low load

1. SAPN: Flexible Exports – longer term, sophisticated, supports market integration and distribution management
2. PV shedding – immediate, simple, robust, supports system security
   - Analogous to load shedding
   - Anticipate use only during abnormal conditions, eg. islanding, line outages, etc.
   - Control room procedures, streamlining SCADA control
   - Identified options that meet requirements:
     - Enhanced voltage management
     - Smart Meters

Consultation: DERProgram@aemo.com.au

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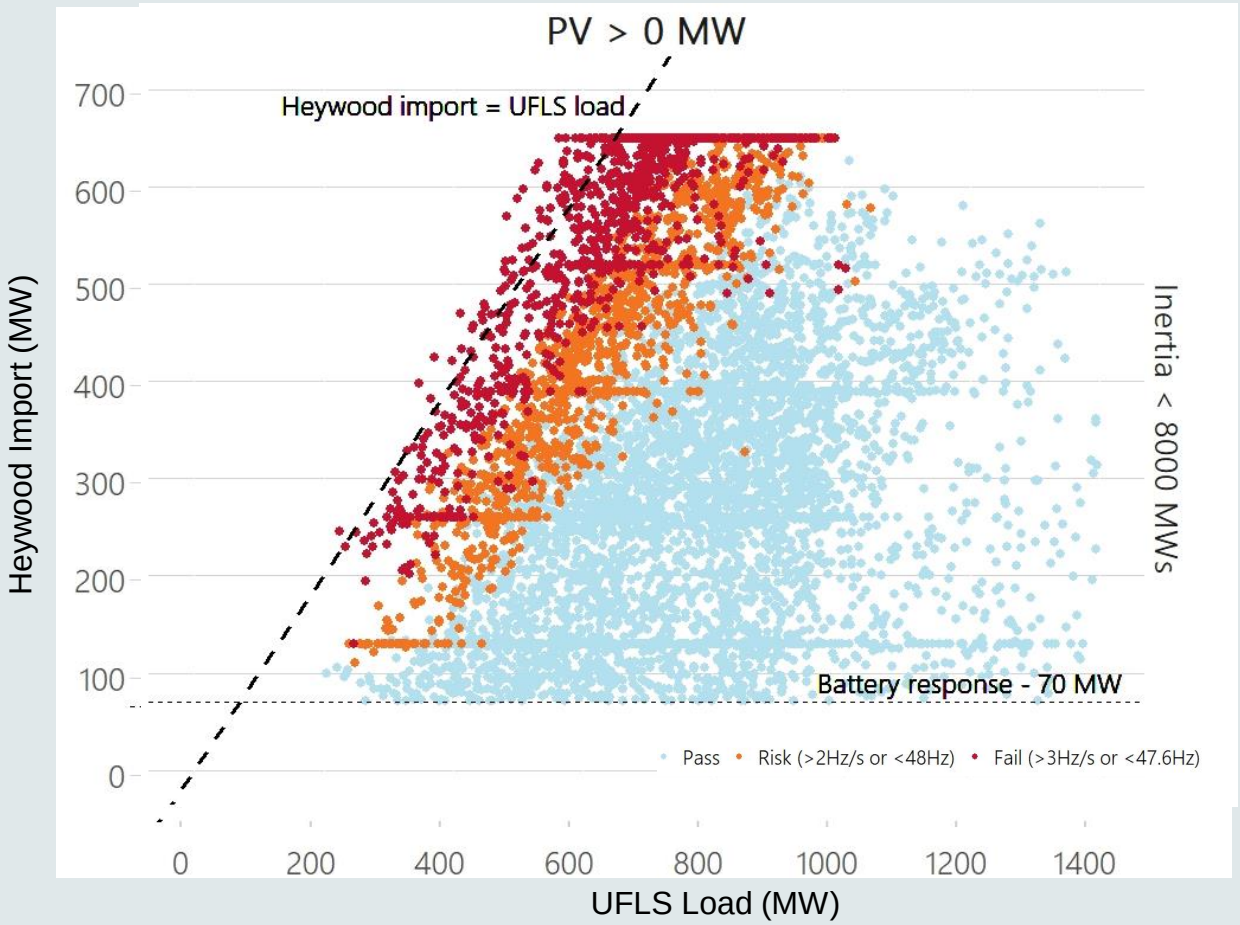
Under Frequency Load Shedding

- UFLS designed to arrest severe under-frequency events
  - Separation events
  - Multiple contingency events
- Security challenges identified:
  1. Reducing net load
  2. Reverse flows
  3. Distributed PV disconnection
- Incidence of risk forecast to increase in SA post syncon commissioning
- Actions:
  - Increase UFLS load
  - Dynamic arming of UFLS relays
  - Heywood constraint
  - Protected event submission
  - NER review
- Consultation:
  - https://aemo.com.au/consultations/current-and-closed-consultations/2020-psfrr-consultation



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Next steps

- Collaboration with stakeholders on design and implementation of mitigation actions
- Analysis for other NEM regions underway
  1. PV disconnection and impact on contingency sizes
  2. Minimum load required for islanded operation (QLD)
  3. UFLS – data request for NSPs
- Continuing development of tools and data
  - Models in PSSE/PSCAD, rollout for stakeholders
  - Improving data on DER behavior (Solar Analytics, UNSW, ARENA)

Agenda Item 4: AEMO rule change request update

Initial DER Minimum Technical Standard Consultation

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COAG Energy Council

- In May, COAG Energy Council endorsed that AEMO submit a rule change request to put in place DER minimum technical standards by October 2020.
  - Focused on AS4777.2 capabilities and interoperability capabilities needed now for DER integration
  - Uniformly applied technical requirements so DER can contribute to the secure and reliable supply of electricity to all consumers in the NEM, provide greater value to DER owners and minimise cross-subsidies to non-DER customers
- Energy Security Board has asked AEMO to consult in parallel with the rule change process on an 'initial' DER minimum technical standard
- AEMC rule change consultation paper released 24 June

Initial Standard Scope

Recommendation

- Improved AS/NZS 4777.2 test procedure to ensure inverters stay connected during short duration voltage disturbances

For Discussion & Consideration

- Mandating AS/NZS 4777.2
- Standards & capabilities required for ‘active’ DER Management (real-time control; distribution technical envelopes) to drive new markets and services
- Last resort back-stop generation shedding via the PoC smart meter

Mass PV disconnection

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Initial standard objective

Objective

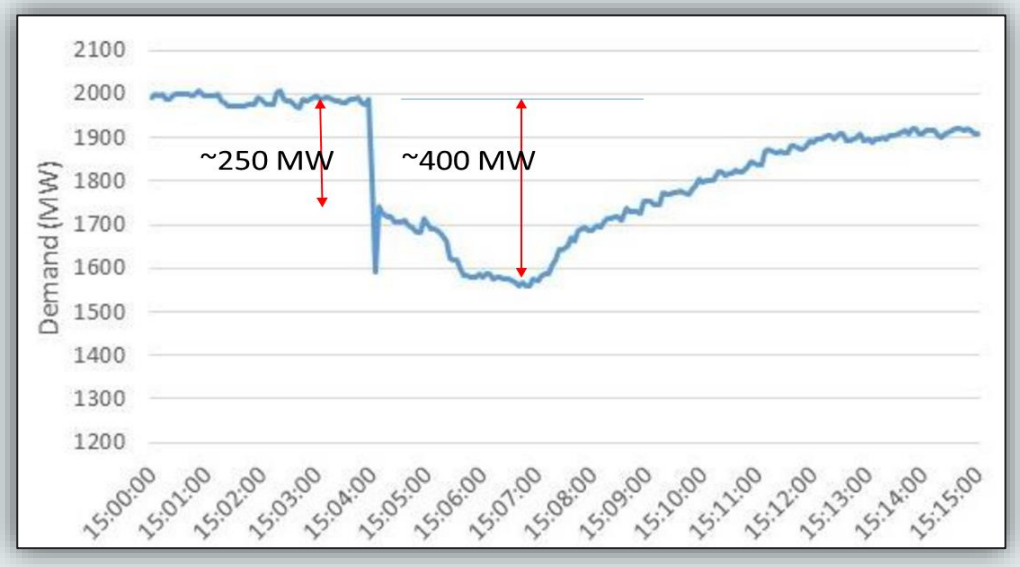
- Provide certainty that DER will ride-through voltage disturbances so that the power system can continue to be managed through or recovered following contingency events.

Why is it needed?

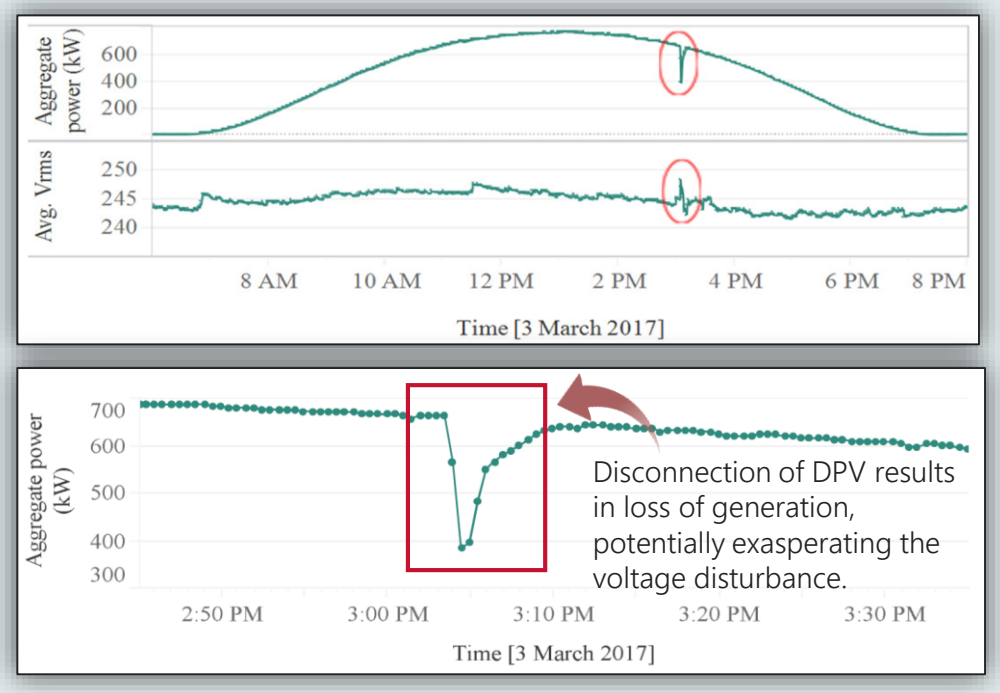
- Mitigate additional costs to consumers and retain system security.

Inverter behaviour during short duration undervoltage disturbance

- The behaviour of inverters shown on 3 March 2017 in SA demonstrates the disconnection:



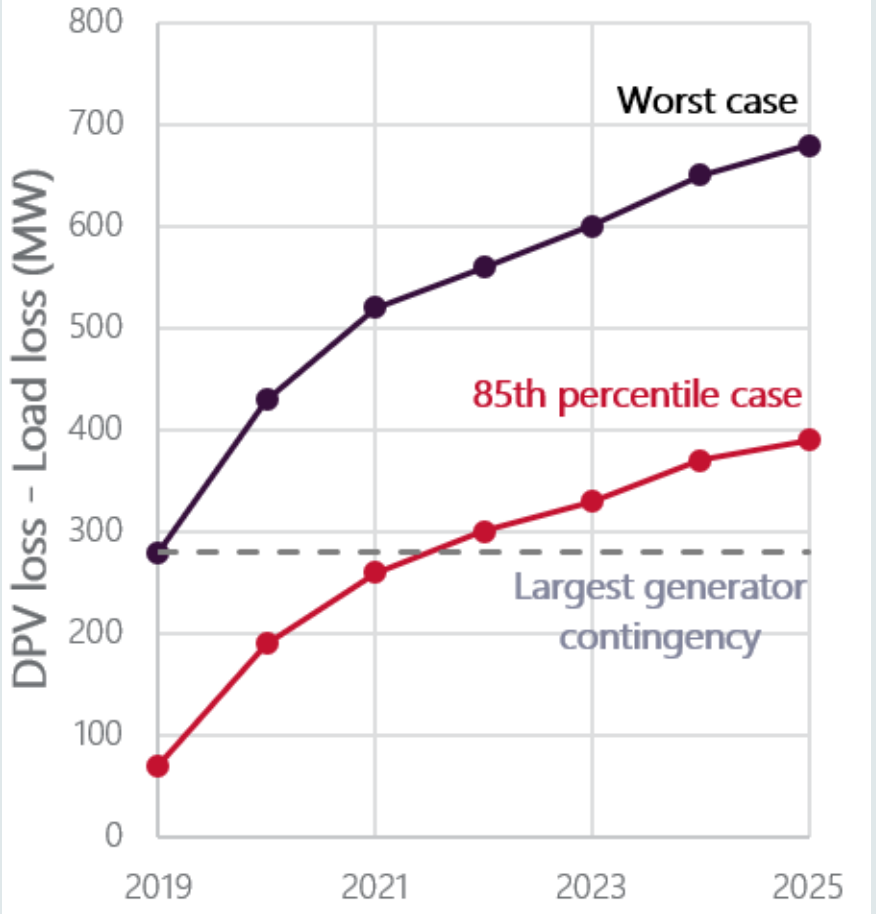
3 March 2017: Demand in South Australia during a short duration disturbance.



3 March 2017: Generation by distributed PV (DPV)

Impact in South Australia

- More DPV will trip off compared to load.
- If this event occurred in 2019 on the highest solar insolation period in Adelaide Metro already experienced a net loss of generation of up to 280 MW.
- In the worse case, these values could be additional to the loss of a synchronous generating unit.
- Looking at the possible net loss of PV:
  - 2020 projected contingency size: up to 500 MW
  - 2024 projected contingency size: up to 700 MW
- This becomes even more problematic when SA is islanded:
  - Impacts UFLS
  - Leads to cascaded tripping and major supply disruption



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Current requirements in Australian Standards

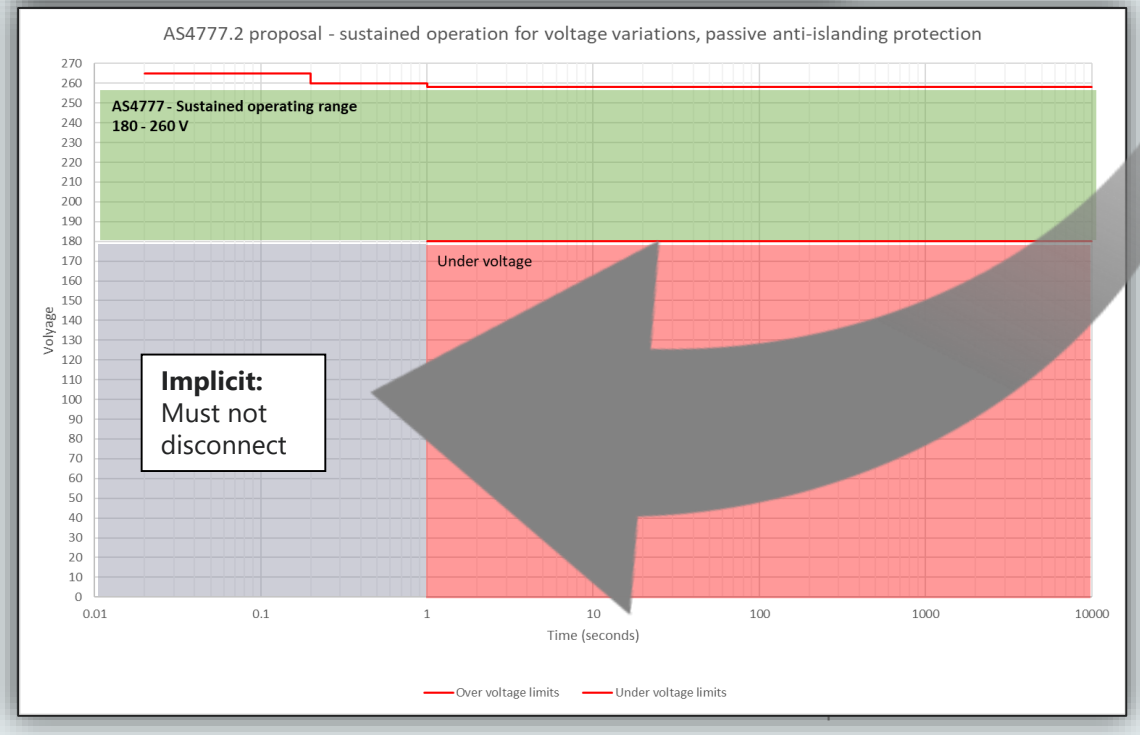
- AS/NZ 4777.2 covers inverter energy systems connected to the power grid
- AS/NZS 4777.2 requires voltage disturbance ride through BUT does not sufficiently test for the behaviour.

- Current AS/NZS4777.2:2015 requirements:

TABLE 13

PASSIVE ANTI-ISLANDING SET-POINT VALUES

Protective function	Protective function limit	Trip delay time	Maximum disconnection time
Undervoltage (V<)	180 V	1 s	2 s
Overvoltage 1 (V>)	260 V	1 s	2 s
Overvoltage 2 (V>>)	265 V	—	0.2 s
Under-frequency (F<)	47 Hz (Australia) 45 Hz (New Zealand)	1 s	2 s
Over-frequency (F>)	52 Hz	—	0.2 s



- The area in grey indicates where inverters are expected to stay connected based on AS/NZS 4777.2:2015 but has not been tested for.

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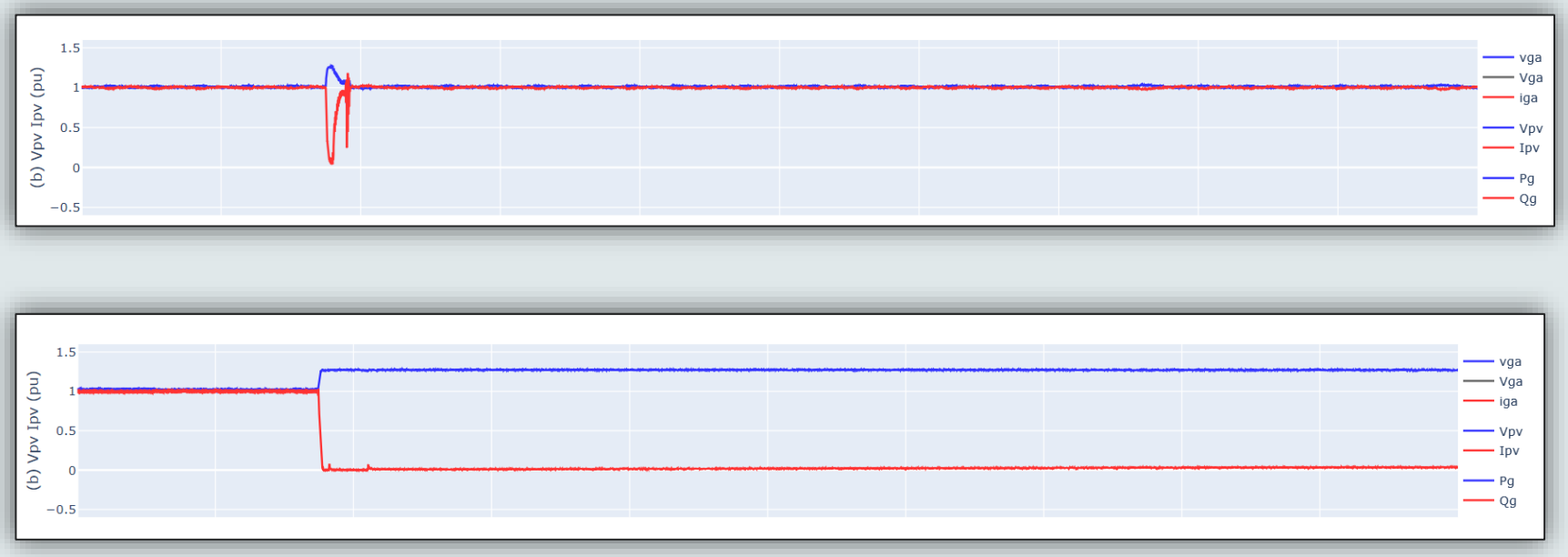
Inverter Performance bench test

- Bench Testing has identified that 10 of 17 inverters that meet AS/NZS 4777.2:2015 requirements to perform correctly during short duration undervoltage disturbances.



Accelerating Requirements

- AS4777.2 is under review to to address this challenge but implementation may not occur until early 2022.
- Stop-gap measure in the interim to address this and reduce contingency sizes.
- At current growth rates nearly two gigawatts of rooftop solar could be installed without this important capability.

- ☑ Testing via AS/NZS 4777.2 testing laboratories
- ☑ Test reports sent to CEC
- ☑ CEC confirms inverters have met necessary requirements
- ☑ CEC publish an approved inverter list

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Active DER Management

Minimum demand management

Market based capabilities and uptake, and a last resort system security tool

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Defining Market Based and Emergency Backstop

DER Interoperability

Market solutions should avoid the need to **use** a backstop **not the requirement** to have one

1. Market Based – Active DER management through Inverter
   a) Introduce System and Network services
      a) develop and adopt security standards; with
      b) robust communications standards
   b) Network trials are focused on increasing hosting capabilities for *export enablement*
   c) Currently voluntary connections with bespoke VPPs
   d) Dependant of customers' WiFi/internet so reliability concerns

2. Emergency Backstop – through *Power of Choice* Metering
   a) Analogist to load shedding
   b) Cybersecurity is already established
   c) Can be used for both load and generation at customers premise (i.e. both min and max demand)
   d) Available now using existing communication frameworks
   e) Provides "Blackstart" – SRAS through metering

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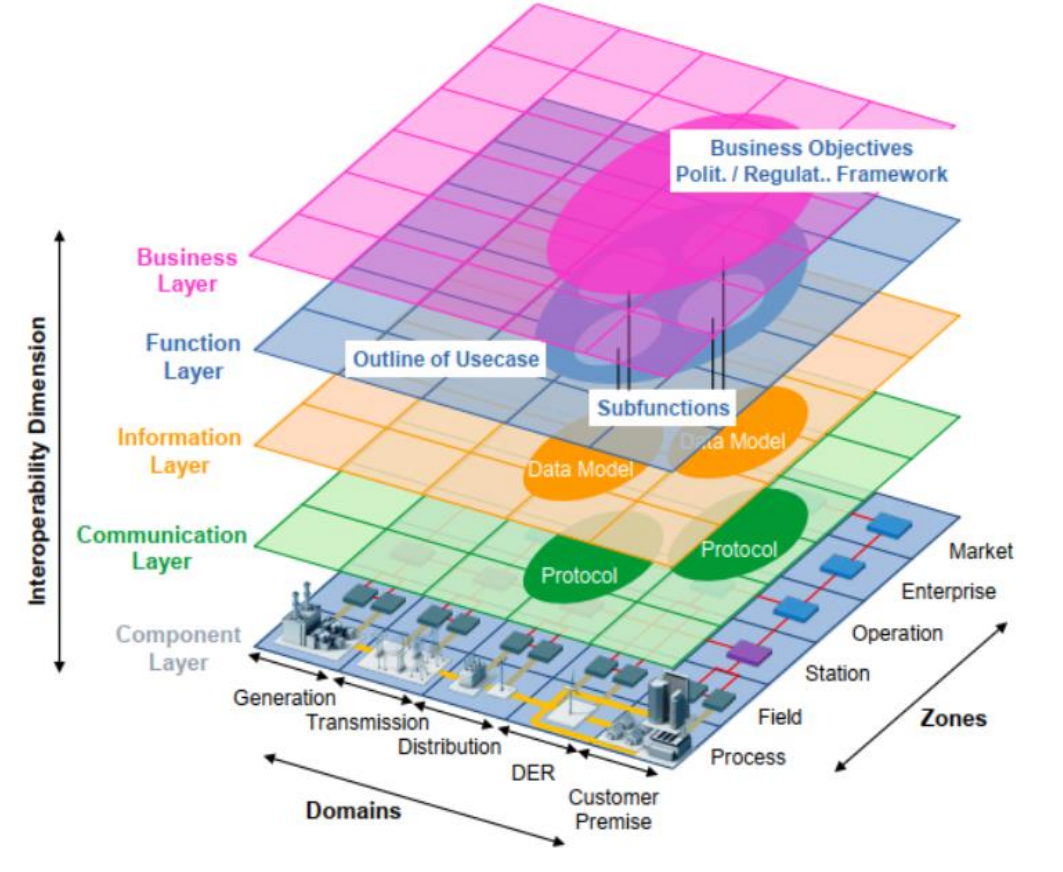
Active DER Management is coming…

Interoperability dimensions



Smart grid architecture model (SGAM)

This will require architectural consideration and standardisation through local consensus to achieve DER integration in a **scalable, efficient** way.

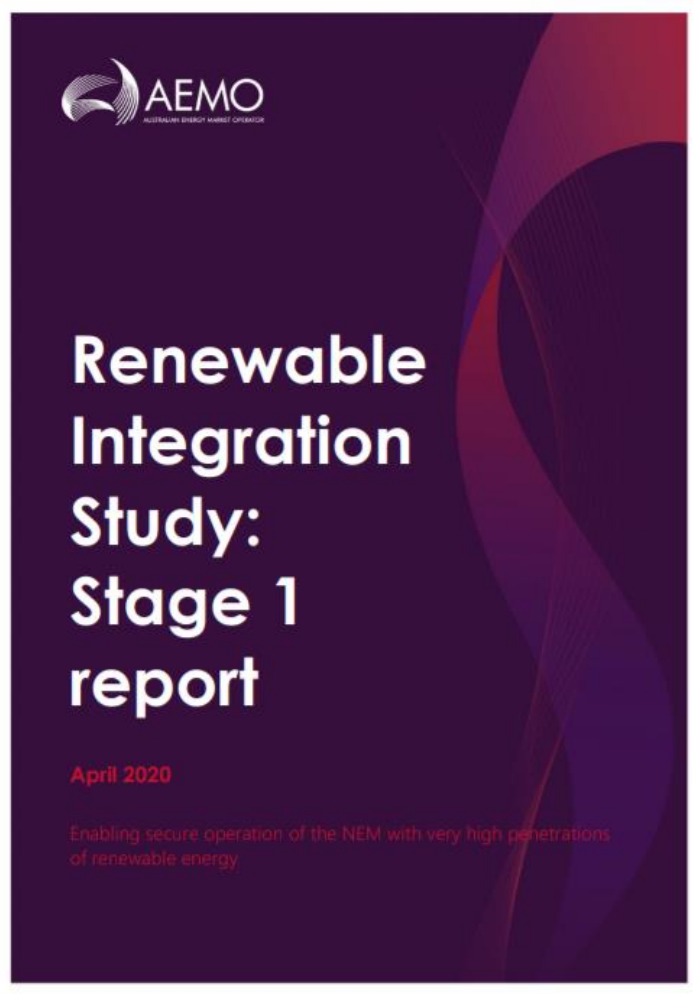
- **Business layer:** who does what and for what purpose when it comes to interacting with DER devices.
- **Functions / services layer:** functionality of interest:
  - "active management" instructions, remote querying of settings, remote changing of settings, …
- **Information layer:** data that needs to be exchanged between parties to achieve these **functions** and how this should be structured
- **Communication layer:** how this **information** is communicated between parties, between parties and devices and between devices.
- **Component layer:** requirements at the device level to make this possible.

It will take a bit of time…

- ESB market reform process targeting commencement of new DER markets and services post-2025
- SAPN aiming for active management of new DER fleet by 2025
- No other DNSP has AER approved investment to follow suit – this would need to be included in their next regulatory submissions commencing 2024 (then 3-5 years for DER fleet coverage)
  - DNSPs current focus is enabling DER export
  - Victorians current regulatory proposals seeking circa $170 M for "export enablement" programs over the next five years
- 2020-2030 DER forecast to increase form 10 GW to 20 GW

Which means, Houston we have a ….

AEMO Renewable Integration Study (RIS)



- Increasing DPV generation is reducing system loading in the daytime.
- RIS demonstrates this trend across the NEM with minimum operational demand projected to occur in the daytime in all mainland regions by 2025.
- Minimum level of load required to keep synchronous fleet on-line for system balancing services – especially when interconnectors are out
- This reduction is now materially impacting system security in South Australia and also projected to do so in other NEM regions within the next few years.
- AEMO is undertaking further more detailed analysis in regard to the timing and impact of minimum demand in Queensland, Victoria and NSW,
- Important to commence this discussion with industry early to enable timely development of mitigation measures, as these may take some years to provide the coverage required of the DER fleet.

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Initial Standard – discussion on a last resort DER generation shedding back-stop

What is needed?

- Interoperability - a robust back-stop mechanism to shed generation, by remotely turning off distributed PV, where required to maintain power system security
- Only for use if extreme abnormal system events were to occur – market or system failure. Analogous to load shedding capabilities.
- Complementary to emerging DER markets and services

Why is it needed?

- To manage the power system in high PV, low load conditions

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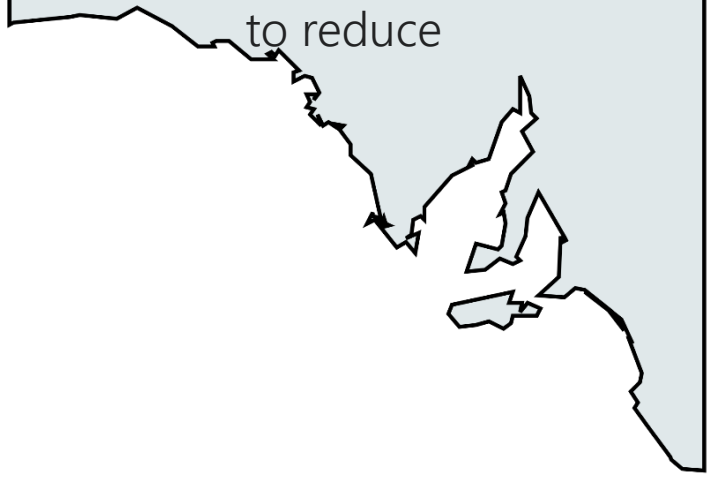
Need for last resort, DPV curtailment capability in SA

- Last resort, **backstop mechanisms**
- Needed in the event of **extreme abnormal power system operating conditions** coinciding with high DPV generation and low underlying demand
- These conditions are **exceedingly rare**

Urgent need for sufficient DPV generation shedding capability in the South Australia region as daytime operational demand continues to reduce



Back-stop capability to be **utilised very rarely**

When used, **the necessary change in the supply-demand balance could be very large and increasing** as DPV generation continues to grow

Insufficient upward load and storage flexibility to completely remove need for DPV generation shedding capability

Smart meter capabilities

Options

Emergency Backstop Capabilities/Implementation

CAN BE USED

Market Services

Backstop Capabilities/Implementation

used

Market Services

Backstop is required when the **Market Fails** or system conditions require the **Market** to be **Suspended**

Options	Capabilities for System Security Emergency Response									
	Reduction of DPV Generation	Visibility of DPV Generation	System Black Restart (permissive to generate)	MW Penetration of DPV by 2025	Implementation Availability	Additional Equipment Required at Premise	Speed of Response (within 15-30mins)	Reliability of Response	Simplicity for installers	Cybersecurity
DRED to Inverter	Yes	No	Maybe	Maybe	2-5 years	Yes	Yes	Maybe	Maybe	Maybe
Direct Comms to Inverter of DPV via API	Yes	Yes	Maybe	No	5+ years	Yes	Yes	Maybe	Maybe	Maybe
Networks Adjust Voltages out of limits	Yes	No	No	Yes	Now	No	Yes	Yes	Yes	Yes
AMI (dedicated element for DPV)	Yes	Yes	Yes	Yes	Now	No	Yes	Yes	Yes	Yes
Tariff encourages increases in load shifting (Market Incentives)	Maybe	No	No	Maybe	2-5 years	Maybe	Maybe	Maybe	Yes	Yes
Community Batteries	No	No	No	No	Market based (Now)	No	Yes	Yes	Yes	Yes

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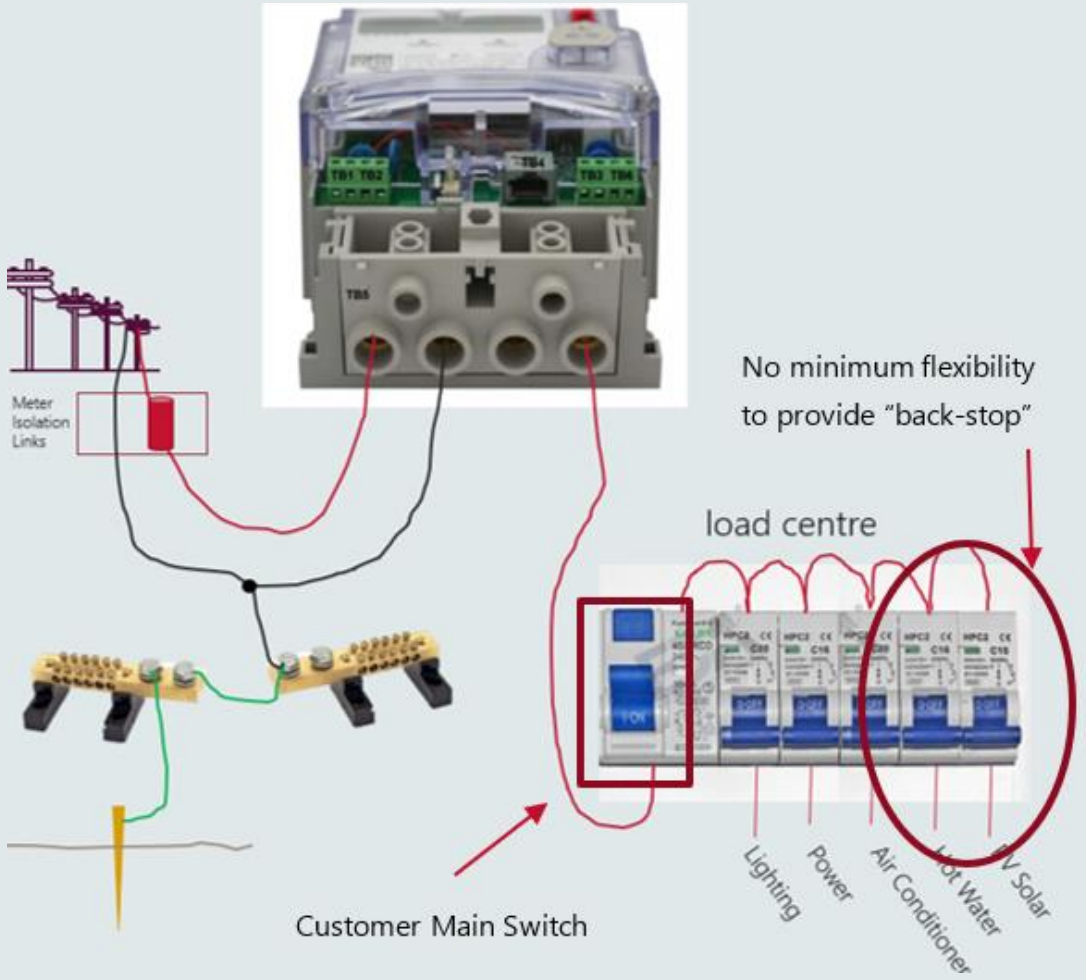
Current Meter capability & wiring

Power of Choice Advanced Metering Infrastructure (AMI) minimum specification:

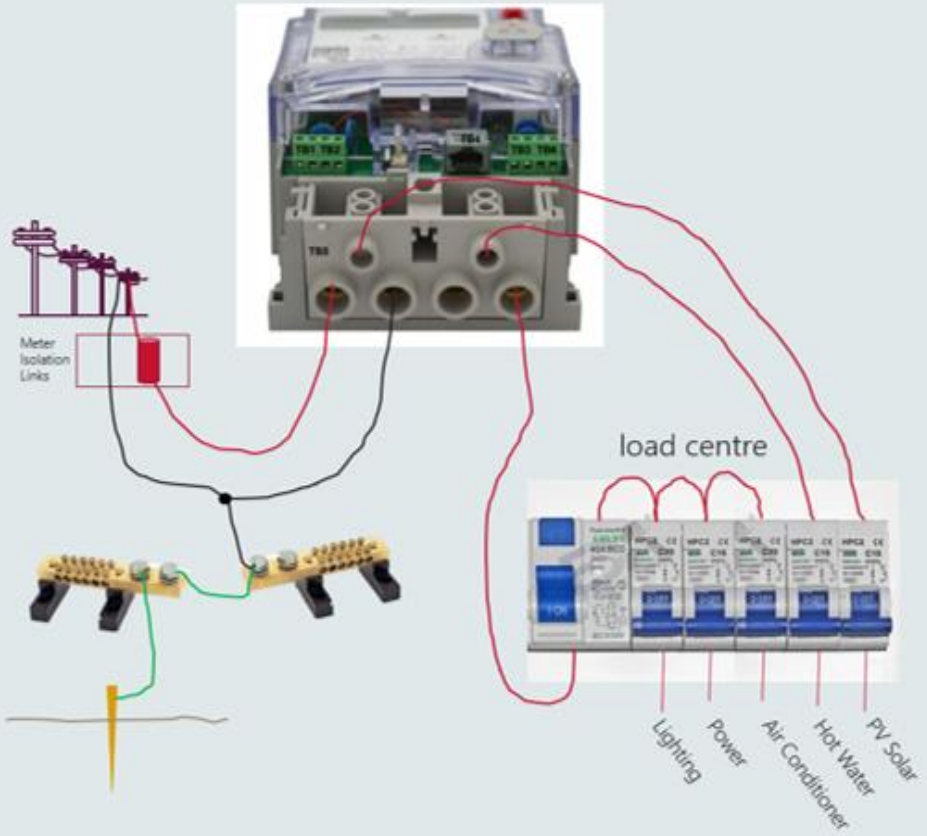
- Accept and respond to remote signals (to de-energise and re-energise)
- Cyber secure and reliable communication channel
- Communication networks in place (with metering coordinators)



Proposed Meter capability & wiring

- Additional metering element and changes to wiring to facilitate separate operation of each of the following load channels:
  - Solar PV and Batteries (where applicable)
  - Controllable Loads such as hot water or air conditioners
  - General power and light

	Primary load only	Primary and controlled load
Current arrangements - standard home (no PV)	Single element, single contactor AMI or non-AMI meter	Two element, single contactor AMI or non-AMI meter
New arrangements - new (AMI) meter installation or replacement e.g. when PV installed	Two element AMI meter with two contactors	Three element AMI meter with three contactors



Why smart meters

- Builds on and uses PoC minimum specification:
  - Remote signalling – controllable
  - Cyber – secure solution
  - Not reliant on Wi-Fi connection – high reliability incl. during black start (when NBN is out)
  - Existing communication network to the meter
- Robust, low cost solution as appropriate for emergency back stop mechanism for power system security
- Cost effective approach - $30 to $50 for the majority of customers going from single to two elements (~80% of customers) up to $130 for most of the rest
- Will trigger when a new meter is installed or when a replacement is required to current installed meter.

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Agenda Item 5: AS/NZS 4777.2

DIEP SDIWG – 15/07/2020

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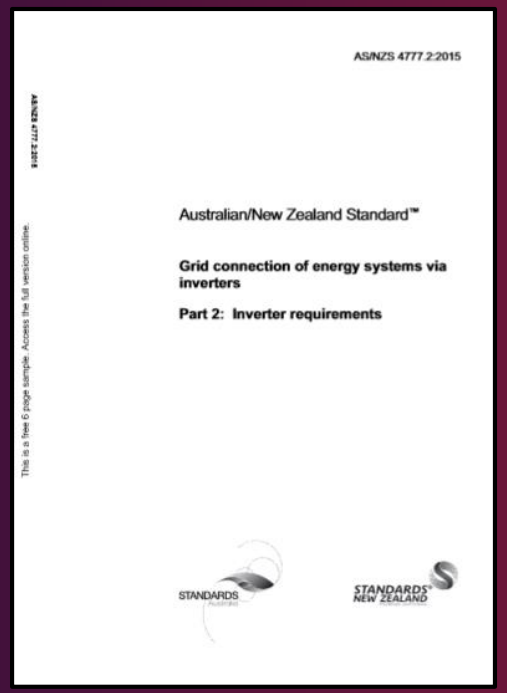
AS/NZS 4777.2 revision



- AS/NZS4777.2 is the Australian Standard for Grid Connection of energy system via inverters: Inverter Requirements

- Revise the scope of the Standard

This standard specifies device specifications, functionality, compliance and performance testing for inverters designed to facilitate connectivity between energy sources and/or energy storage systems and the grid, connected at low voltage. This includes electric vehicles operating in a vehicle to grid mode.

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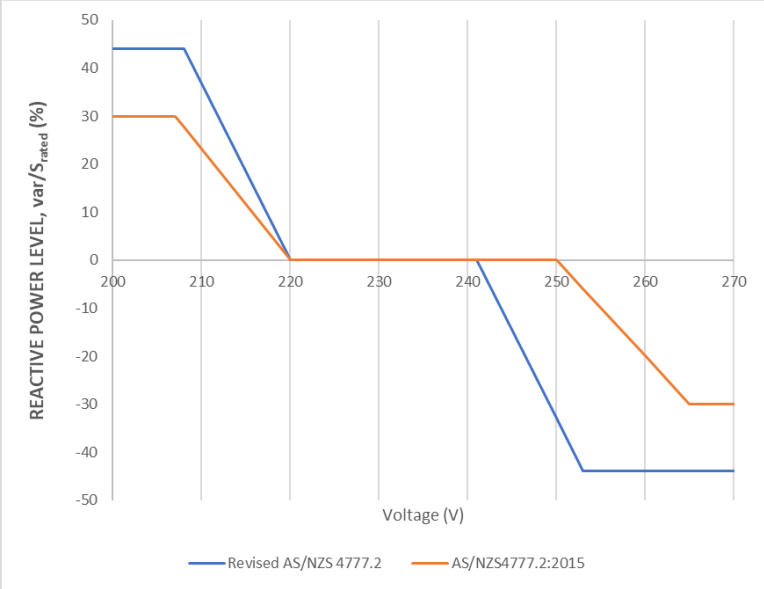
Power Quality Modes

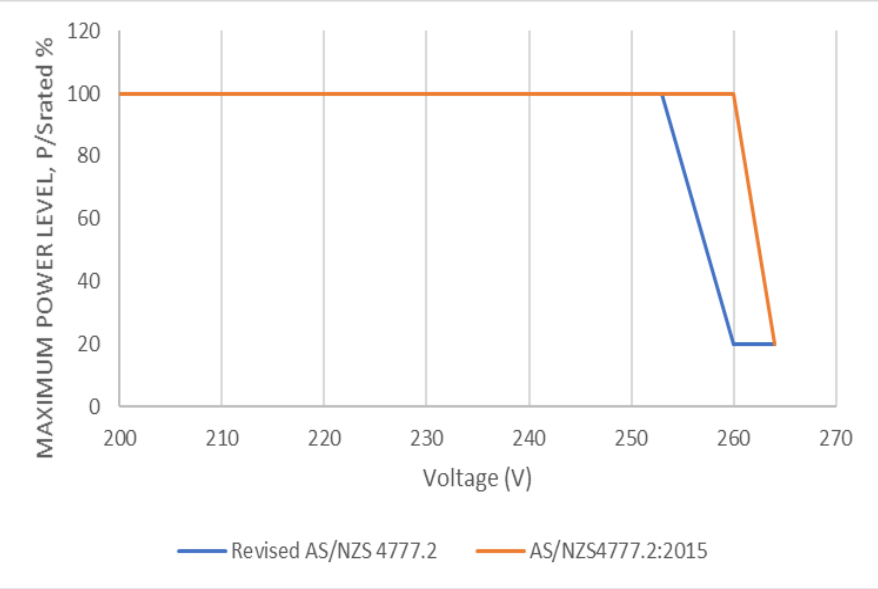
Volt-Var and Volt-Watt

- Default enablement
- Determine relative priorities of control schemes
- Consider smaller deadbands and settings aligned with international standards

Proposed changes are intended to:

- Align expected response to International Standards (where applicable),
- Provide an autonomous response to local voltage management issues and maintain the grid within technical limits,
- Increase hosting capacity of distribution network feeders





Power quality modes

Frequency response

- Specify required response times
- Specify extended response to extreme over and under frequency events from storage systems
- Require under frequency response from curtailed inverters

Proposed changes are intended to:

- Provide an autonomous response to frequency to maintain the grid within required limits,
- Ensure inverters do not exacerbate disturbances and help to manage their response.

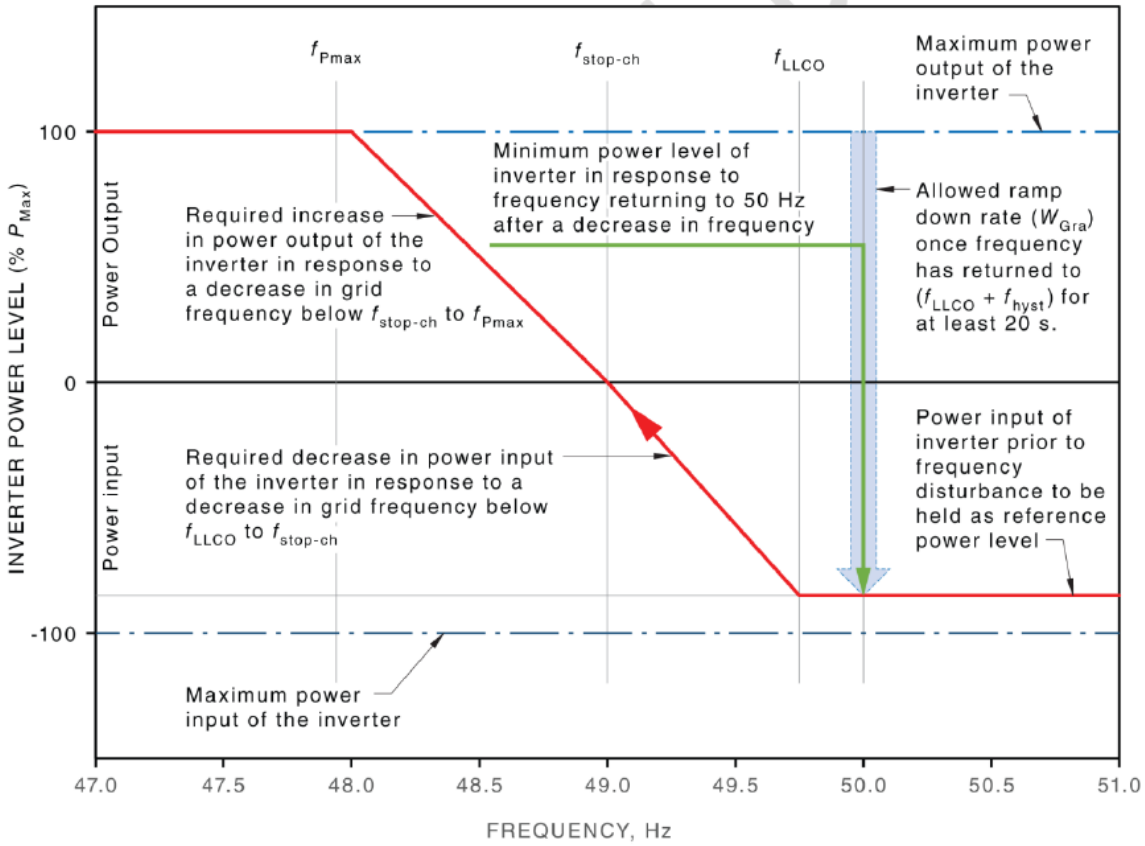
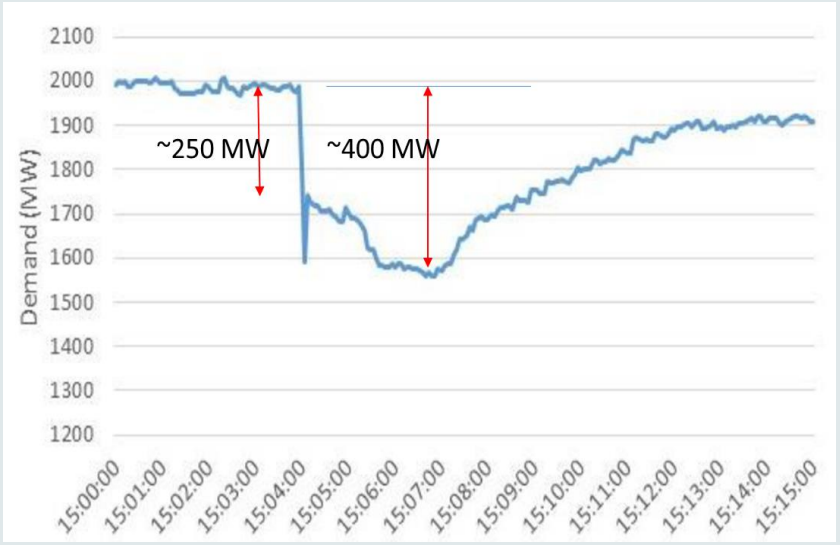


Figure 4.2 Example two-stage frequency response for a decrease in frequency for the multiple mode inverter with energy storage with $f_{stop-ch}$ 49.0 Hz

Need for disturbance withstand

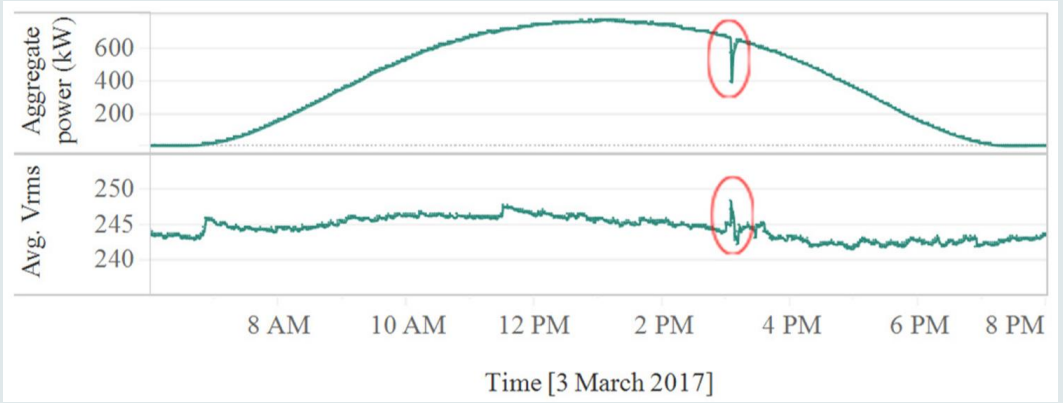
- 3 March 2017: Series of faults resulted in the loss of ~610 MW of generation in SA
- Flows on Heywood interconnector increased to ~918 MW.
- Estimated that demand reduced ~400 MW
- Estimated that distributed PV reduced by ~150 MW (40%)
- Projecting forwards, loss of 40% of DER will exceed credible contingency sizes, possibly requiring additional frequency control reserves.

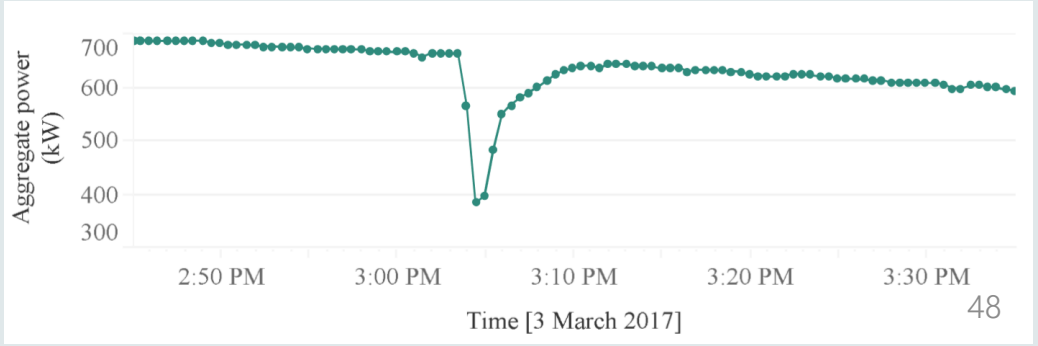
3 March 2017: Demand in South Australia:



Data from Solar Analytics (~200 distributed PV systems) confirms disconnection of some inverters:

Generation by distributed PV:





Analysis by Naomi Stringer, UNSW Sydney
Data from Solar Analytics

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Disturbance withstand capabilities

Proposed changes are intended to:

- Align their expected response to disturbances (as much as possible) to large-scale generators and International Standards,
- Ensure inverters have a minimum response during disturbances (provision of minimum requirements),
- Provide immunity to transmission events while maintaining adequate protection from islanding for distribution networks,
- Define clear zones of operation to provide clarity to manufacturers on the required behaviour and responses of inverters during system conditions.

Disturbance ride-through

- Extend as much as possible to meet both bulk system and DNSP needs
- Tiered responses to satisfy both bulk system and the distribution network

Cease to Generate

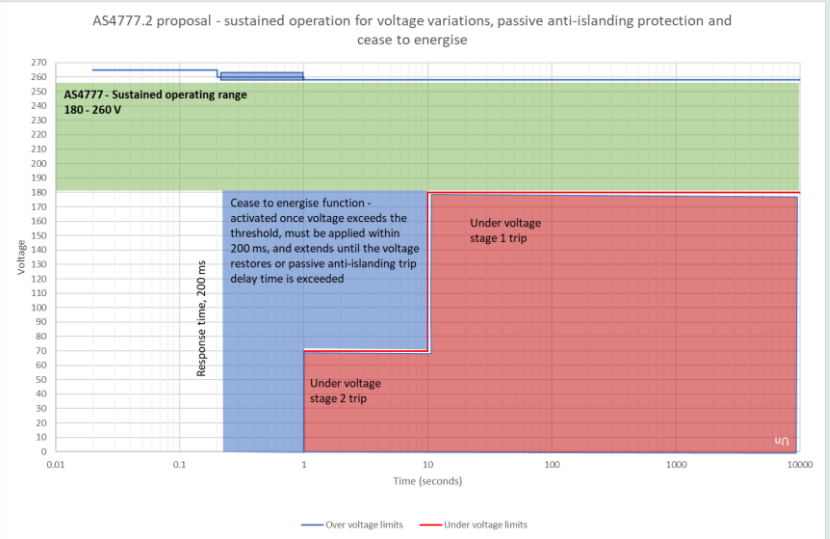
- Manage extended passive anti-islanding operate times by ensuring no supply to a potential island

Table 4.1 Passive anti-islanding voltage limit values

Protective function	Protective function limit	Trip delay time	Maximum disconnection time
Undervoltage 2 (*V*<<)	70 V	1 s	2 s
Undervoltage 1 (*V*<)	180 V	10 s	11 s
Overvoltage 1 (*V*>)	265 V	1 s	2 s
Overvoltage 2 (*V*>>)	275 V	—	0.2 s
NOTE: Refer to Table 2.5 for the measurement specifications.			

Table 4.8 Voltage disturbance response

Voltage limits	Inverter response
>260 V	Cease power generation
180 V to 260 V	Continuous operation
<180 V	Cease power generation



Disturbance withstand capabilities

Multiple voltage disturbances

- Ride-through requirements for multiple voltage disturbances

Phase angle jump

- Specify withstand requirements for phase angle jumps

Rate of Change of Frequency

- Specify withstand requirements for RoCoF

Table 4.9 Voltage phase angle shift withstand requirements

	Single-phase disturbance	Three-phase disturbance
Single-phase inverter	60°	—
Three-phase inverter	60°	20°

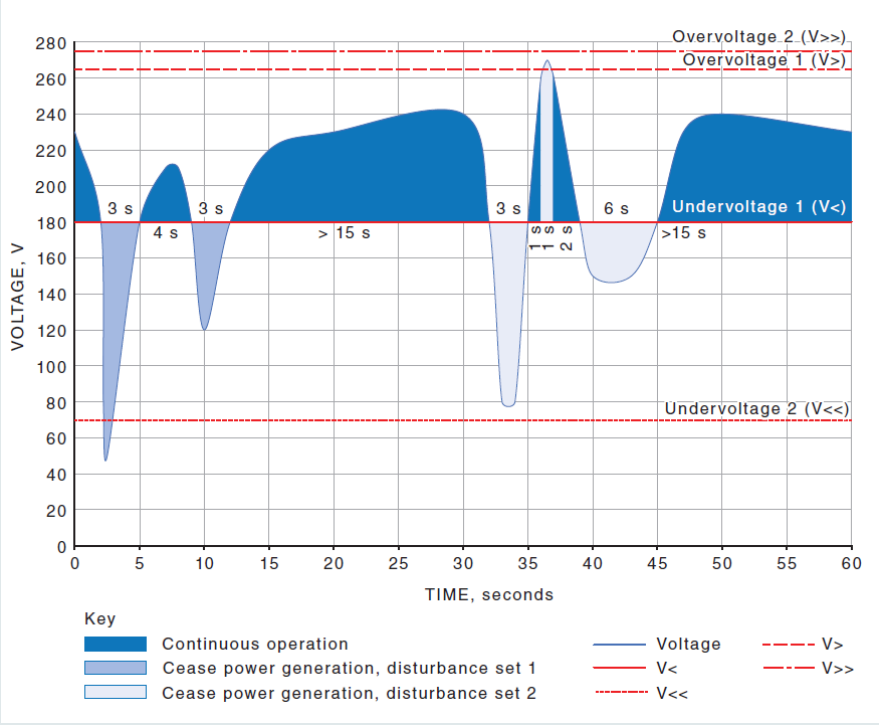
4.5.6 Rate of change of frequency

The inverter shall maintain continuous operation for frequency excursions with a rate of change of frequency (ROCOF) that do not exceed ±4.0 Hz/s for a duration of 0.25 s.

Compliance shall be determined by type testing in accordance with the sustained operation for frequency variations test specified in Appendix J.

Proposed changes are intended to:

- Align response of inverters to disturbances to system needs (reflecting as far as practical large-scale generators and International Standards),
- Ensure inverters have a minimum response during disturbances (provision of minimum requirements)



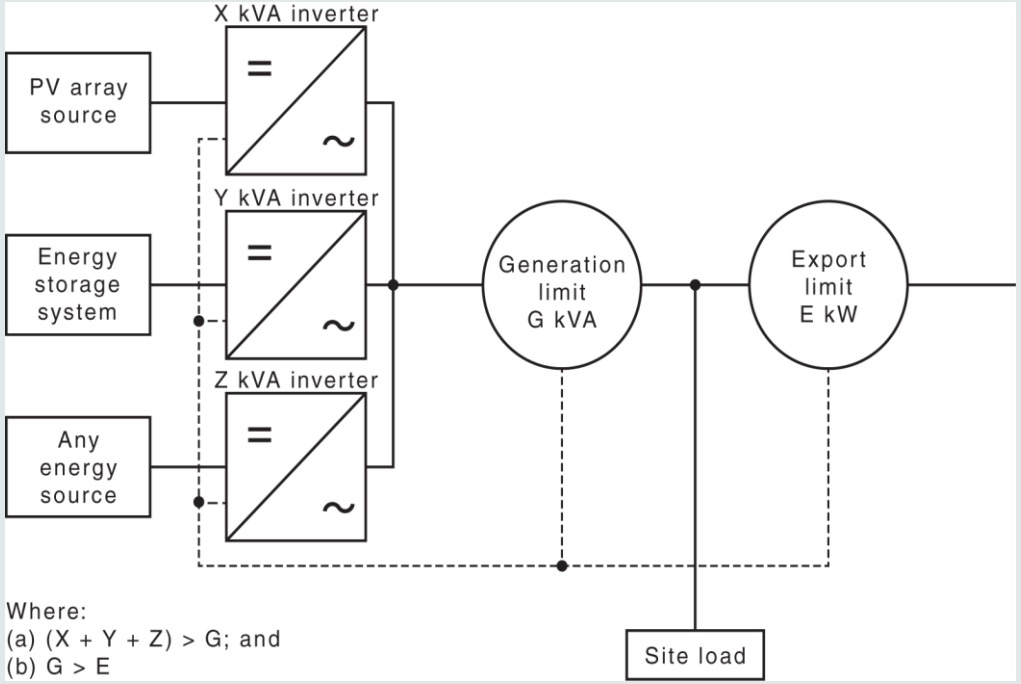
Generation Control Function

Generation Control Function

- New specifications for export limit control
- New specifications for generation export limits

Proposed changes are intended to:

- Align with AS/NZS 4777.1
- Specify the requirements for managing site level generation for purposes of export control or limiting generation output to less than total capacity all inverters installed.



Compliance, Measurement and Control

Compliance

- Review compliance mechanisms.
- Include new compliance requirements for new parameters.

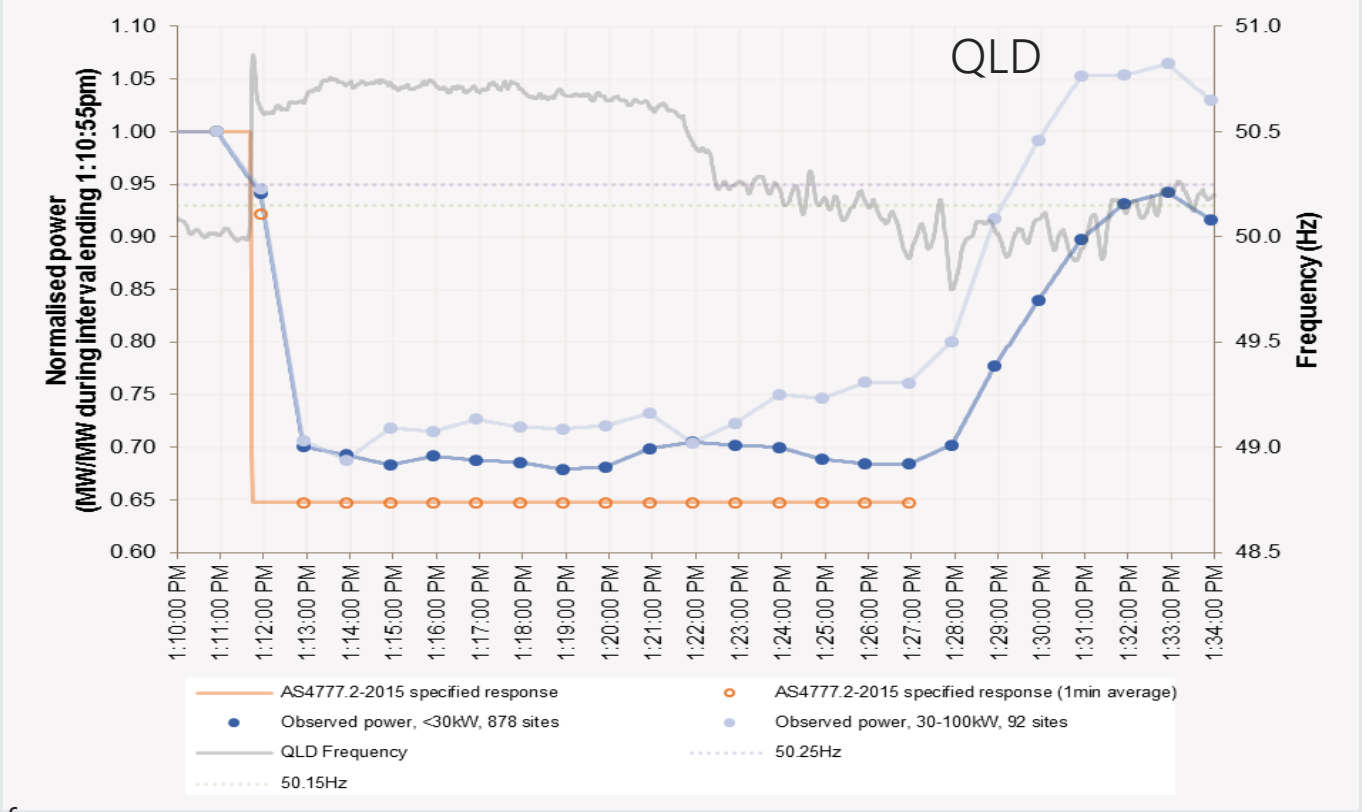
Measurement and Control Functionality

- Define minimum requirements for measurement and control system operation.
- Define prioritisation of responses.

Proposed changes are intended to:

- Provide minimum requirements for system measurement and control (provides certainty to inverter response),
- Optimise DER responses so they do not cause control system instability,
- Provide degree of certainty to AEMO on the expected response of the DER generation fleet (to incorporate into our models).

Separation event 25 Aug 2018:



Analysis by Naomi Stringer, UNSW Sydney
Data from Solar Analytics

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Standards Australia process

- **June 2019:** AEMO submitted the proposal to review the Standard.
- **July 2019:** Accepted by Standards Australia
- **September 2019:** Working group was kicked off
  - Device Specification
  - Functionality
  - Testing
- Throughout the process worked alongside Standards Australia to accelerate timelines
  - Proposal of an Interim Standard although was not accepted by committee members
  - Instead accelerated SA process timeframes
- **9 July 2020** – Released for 9 weeks of Public Comment.
- **Early 2021** – Proposed publication date

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Agenda Item 6: DER Device Standards – Taskforce development

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Taskforce Name:

DER Device Standard Taskforce

What is the big idea/mission statement?

Fit for purpose standards are implemented for the optimisation of DER for the power system and benefit of all consumers.

Who needs to participate?

- DER device manufacturers
- Manufacturers & Suppliers
- Network Service Providers
- Consumer groups
- Policy/Regulatory bodies
- Retailers/ Aggregators
- AEMO
- Governments (Federal/state)

How will the taskforce operate?

- Monthly taskforce meetings will be held – ad hoc meetings may be required to support outputs
- All outputs/recommendations to be put to SDIWG for ESB DER steering group consideration and obtaining approval. All milestone tracking and developments must be reported to SDIWG.
- The taskforce will interact via collaborative meetings on a regular basis; all interactions to be clearly documented (minutes/actions).
- All participants recognise that items of discussion are in the public domain unless clearly identified as confidential, at which point confidentiality must be maintained. Agendas, presentations and minutes will be published on AEMO's website.
- All participants act in accordance with AEMO's competition protocol.
- All documentation required to support outcomes will be shared via a central repository for members to access.
- Decisions made are based on consensus agreement. If consensus cannot be reached, issue will be escalated to SDIWG.

What problem does it solve?

New technology and appliances are being introduced that they do not have the required level of capability to support grid security and participation:

- Inverter capability
- WIFI and communications capability

Prioritisation of uplift needs to align to system requirements.

Taskforce Milestones:

Short Term Priorities (0-6 mths):

- AS/NZS 4777.2 consultation
- AS 4755.2 consultation (public comment)

Medium Term Priorities (6-18 mths):

- Demand Response capability (EV alignment)
- Performance standards (EV alignment)
- Review of battery storage and inverter mandate requirements (RIS recommendation)
- Discussion papers/ recommendations for standard development and gaps.
- EM1 Electric Vehicles committee participation
- Smart Energy committee (EL62) participation/recommendations on problems to be solved – dictionary of terms reviewed in context of DER

Long term (2 yrs+):

- Discussion papers/ recommendations for standard development and gaps.

Key Activities:

- Project proposal development
- Implementation guideline development
- Consultation channel on new/interim standards
- Develop recommendations on standard requirements and standards proposals
- Building consensus on approaches to issues raised
- Source funding for accelerated standard uplift

Measuring Success:

- Increased industry collaboration
- Streamlined approvals and action taken to develop standards
- Active participation by all members
- Recommendations accepted by Taskforce members and actioned by SDIWG/related working groups.

Purpose/Scope:

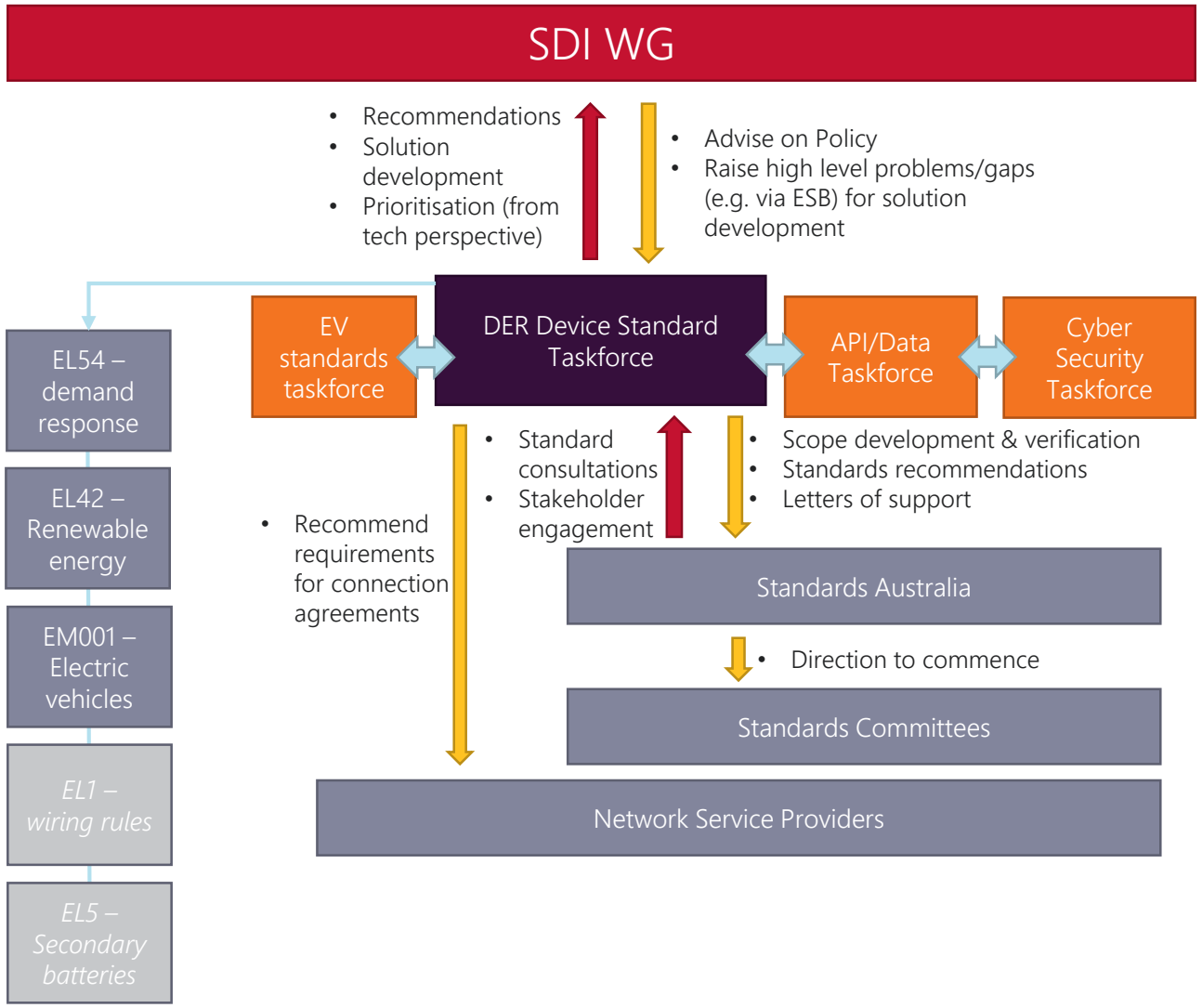
- Create interrelationships & providing feedback on scope with existing/new Standards committees
- Link between policy and technical standards
- Two-way communication to SDI WG to support development of priorities
- Development of recommendations from broader studies for Standards Australia consideration
- Development of work packages for standards proposals
- Recommendations to Network Service Providers (industry guidelines)
- Accountability against timelines and accelerating activities through consensus building and prioritisation
- Identification of device compliance shortfalls
- Device Compliance and monitoring requirements/recommendations
- Small & Medium Enterprise connected at distribution level – performance requirements

Out of Scope:

- Electrical Safety rules for equipment
- Installer compliance

DRAFT FOR DISCUSSION

Information Flows:



Membership:

Membership consists of **technical representatives**.

Example membership:

- Consumer Groups
- Manufacturers – AIG, Consumer Electronic Supplier Association, peak body representatives

(Appliance Manufacturers including Air conditioners, pool pumps, hot water systems, EVs, battery systems, Home energy management systems, inverter manufacturers)

- Retailers
- Clean energy council (member)
- Smart energy council (member)
- Energy Networks Australia (member from NSP)
- Standards Committees representatives (Chair/deputy chair/appointed liaison)

Policy discussions to be held as part of the SDIWG.

To be confirmed:

- *Small & Medium Enterprises connected at Distribution level (CNI)*

Outcomes:

- Project proposals for Standards Australia consideration based on recommendations
- Implementation & industry guidelines for proposals
- Interim standard or handbook development (drafting)
- Letters of support from Working Group regarding Standards uplift/development
- Consensus and engagement of relevant groups (e.g. AS 3000)
- Discussion papers & recommendations to SDIWG

Agenda Item 7: National API working group update

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Australian National University

Battery Storage and Grid Integration Program

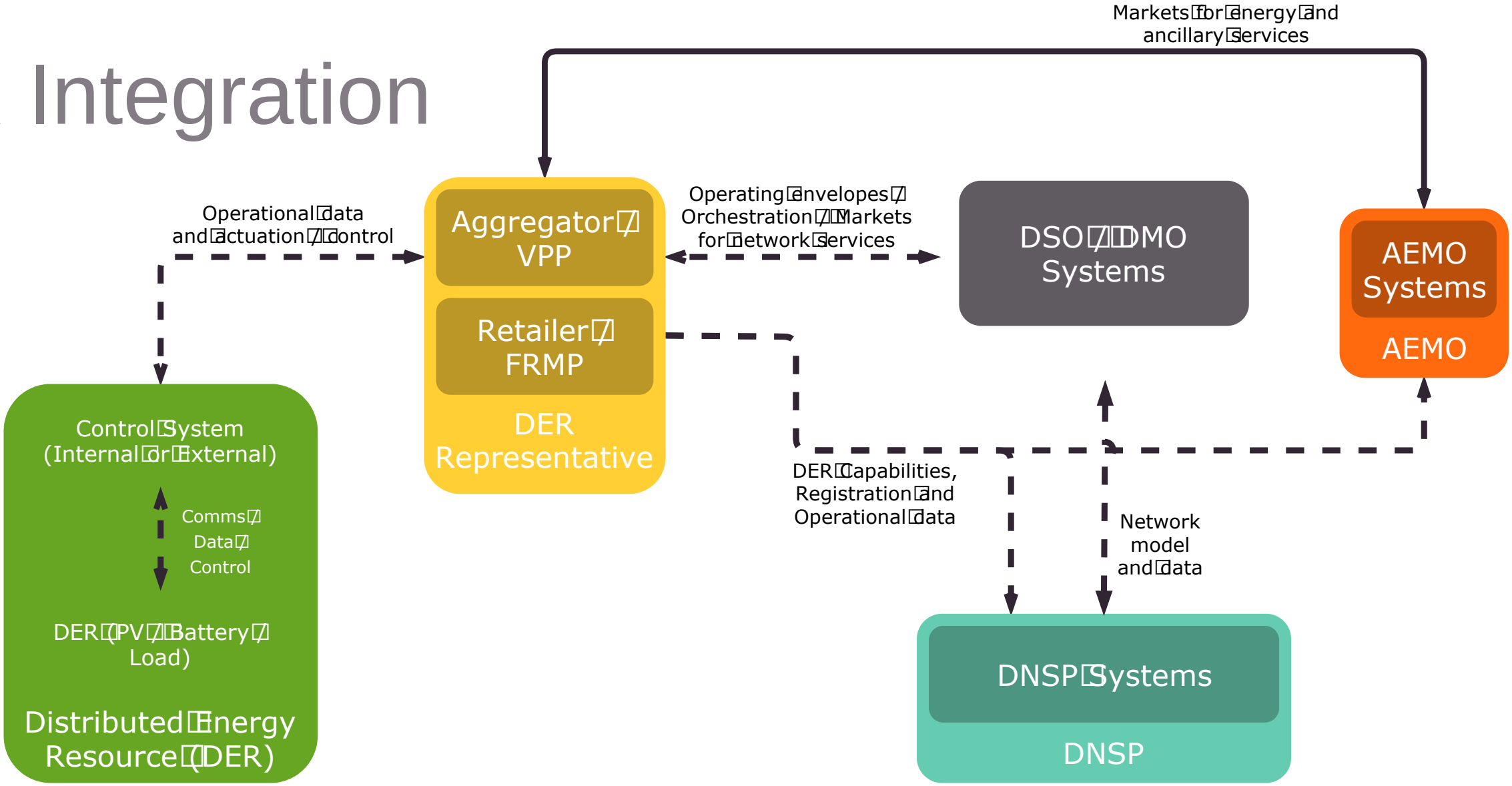
An initiative of The Australian National University

DER Integration API Technical Working Group

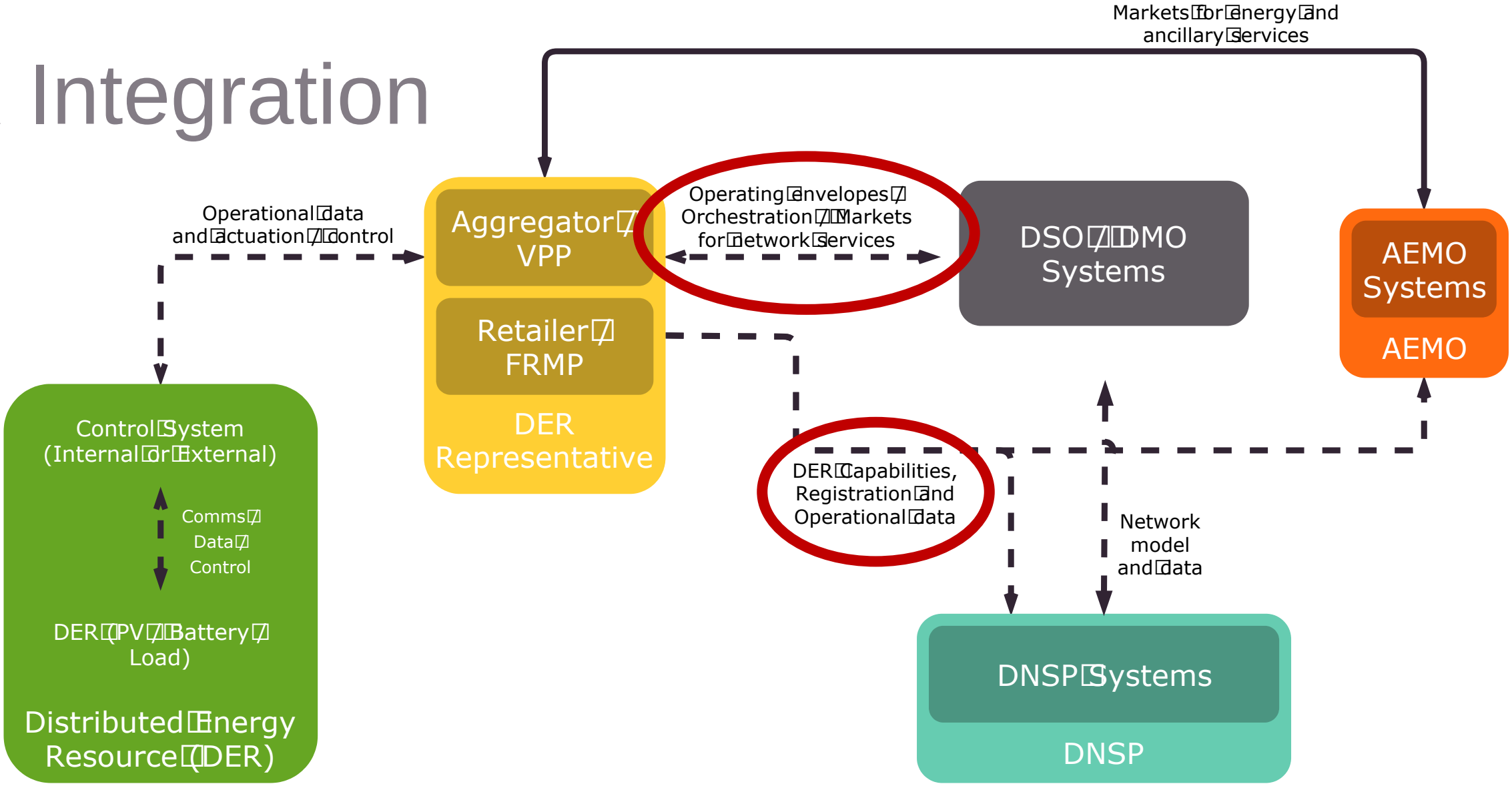
DER Integration API Technical WG

- The WG has representation from:
  - AEMO
  - AGL
  - ANU
  - AusNet Services
  - Energy Queensland
  - Greensync
  - Horizon Power
  - SA Power Networks
  - TasNetworks
  - Combined Energy
  - Rheem
  - SwitchDin
  - Watt Watchers
  - Redback Technologies

DER Integration



DER Integration



Technical Working Group Background

- ARENA and AEMO eager to coordinate APIs for DSO / DMO / VPP projects, many funded by ARENA.
- Representatives from key projects convened the working group.
- Activities, goals, governance and rules of engagement encoded in an agreed charter.

Activities

1. Use Cases for DER Integration, including actors, data generation and data flows within the system.
2. An agreed API specification, allowing data to be programmatically transferred between actors.

Current Progress

- Regular meetings since February 2019.
- Use case identification and development completed late 2019 (19 use cases identified)
- Standards review determined IEEE 2030.5 the most promising standard to underpin working group activities
- Development of Implementation Guide in progress
- Main group meets every 3 weeks
- Technical discussion group meets fortnightly to progress work on implementation guide

DER Integration Use Cases

19 use cases identified and described:

- Actors involved
- Data generated and required by each actor
- Data specification (geography, resolution etc.)

7 use cases identified for further development and inclusion in implementation guide

Australian Implementation Guide - 2030.5

Australian Implementation Guide for the IEEE2030.5 standard (mirroring the California Rule21 Implementation Guide).

- Draft specification – September 2020
- Final – December 2020

Implementation Guide Progress

- Fortnightly technical discussions with interested parties
- Two ‘companion’ documents also in development:
  - Comparison with California Rule 21 guide
    - Provides rationale/explanation for any differences between implementation guides
  - Reference interconnection handbook
    - Provides a reference for implementation specifics that may vary between regions/networks, that are not prescribed by the standard/guide
- Also looking for guidance/clarification on ambiguous/under-specified portions of the standard and Rule 21 guide

Thankyou

Battery Storage and Grid Integration Program

The Australian National University

Canberra, Australia

Agenda Item 8: Other business

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Other discussion items

1. **Next meeting:** request to move to alternative day (once off) – Tuesday 18th August.

2. **Agenda items:** could members please provide suggestions for any agenda items they would like included for discussion at the next working group by Friday 31st July.

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Meeting Summary

Agreed Actions
Next meeting: or 18th August TBC

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