reposit

14 August 2022

Dear MASS Consultation Team,

Thank you for the opportunity to contribute to the Very Fast FCAS MASS consultation – stage 2.

1. Type testing of FCAS metering

Reposit supports the type testing of FCAS metering for all FCAS services and agrees that traceable accuracy testing is important if a level playing field is to be provided for Australian and international market participants and technology vendors.

2. Selection of the appropriate standard for Australian markets

Reposit suggests that the nomination of IEC61557-12 requires additional consideration. And that there are more appropriate standards that can referenced for power and frequency measurement certification under Australian circumstances.

AEMO is right to limit the application of the standard to the power and frequency measurement tests so as to "ensure that the type test does not add a significant cost burden to the participant"[i]. In effect, AEMO are not interested in the entire standard, but only in the testing procedures, influence factors and disturbances listed in the standard that are applicable to power and frequency measurement.

AEMO define the accuracy and precision requirements of MASS metering in Table 4 of the MASS and so these values do not dictate the choice of standard. The choice of standard then should be made based on practical implementation concerns.

Appropriate standards already widely used in the NEM

The NMI M 6[ii] standard is used throughout the NEM on millions of Type 1-6 revenue meters. It is published and maintained by the National Measurement Institute (NMI). The test procedures in NMI M 6 actively consider voltage, current and frequency accuracy. The tolerances are different to Table 4 of the MASS, but as described above, AEMO is free to specify accuracy and precision requirements.

Section 4.7 of the NMI M 6 standard describes permissible error (accuracy/precision) and the influence factors and disturbances when testing for that error.

Table 1. Percentage error limits for single phase and polyphase direct-connected meters with balanced loads

Range for test current	Power factor	Percentage error limits for meters of class[1]	
		1	1.5
$0.05\ I_b \le I < 0.1\ I_b$	1	±1.5	±1.5
$0.1\ I_b \le I \le I_{max}$	1	±1.0	±1.5
$0.1\ I_b \le I < 0.2\ I_b$	0.5 inductive	±1.5	±1.5
	0.8 capacitive	±1.5	—
$0.2\ I_b \le I \le I_{max}$	0.5 inductive	±1.0	±1.5
	0.8 capacitive	±1.0	—

Table 4. Influence factors (I) and disturbances (D)

Influence factors and disturbances	Test clause or reference	I/D	Range for test current (balanced load)	Power factor	Limits of variation in percentage error for meters of class			
					0.2	0.5	1	1.5
Voltage variation[1]	A.2.12	I [1]	$0.05\ I_b \le I \le I_{max}$	1	—	—	0.7	1.0
			$0.1\ I_b \le I \le I_{max}$	0.5 ind.	—	—	1.0	1.0
			$0.02\ I_n \le I \le I_{max}$	1	—	—	0.7	—
			$0.05\ I_n \le I \le I_{max}$	0.5 ind.	—	—	1.0	—
			$0.05\ I_n \le I \le I_{max}$	1	0.1	0.2	—	—
			$0.1\ I_n \le I \le I_{max}$	0.5 ind.	0.2	0.4	—	—
Frequency variation	A.2.13	I	$0.05\ I_b \le I \le I_{max}$	1	—	—	0.5	1.0
			$0.1\ I_b \le I \le I_{max}$	0.5 ind.	—	—	0.7	1.0
			$0.02\ I_n \le I \le I_{max}$	1	—	—	0.5	—
			$0.05\ I_n \le I \le I_{max}$	0.5 ind.	—	—	0.7	—
			$0.05\ I_n \le I \le I_{max}$	1	0.1	0.2	—	—
			$0.1\ I_n \le I \le I_{max}$	0.5 ind.	0.1	0.2	—	—

Should AEMO find the M 6 standard insufficient for some reason, NMI also publish the more modern NMI R 46[iii] and NMI M 13[iv] standards.

Reposit suggests that AEMO engage with NMI when considering the selection of appropriate testing procedures and other key metrology values for the FCAS services.

Lab testing capability and capacity

Reposit's FCAS metering is embedded in its controller. This metering is not certified to the power and frequency measurement requirements of IEC61557-12.

Reposit was unable to identify any Australian certification laboratories that were able to certify power and frequency metering to IEC61557-12. This means that any metering that is not already certified to this standard's power and frequency measurements currently requires testing in international laboratories. This seems grossly inefficient given that FCAS markets do not span international borders.

The lack of local certification labs for IEC61557-12 unfairly penalises Australian designers and manufacturers of clean energy technology and favors large, international manufacturers and their customers.

The selection of an NMI-based standard means that at least nine local certification labs are immediately available[v], all of which are appointed by the National Measurement Institute:

Title	Address	Expiry date	Services offered	State/territory
Itron Australasia Pty Limited (PDF 392.62 KB)	8 Rosberg Road, WINGFIELD SA 5013	29 June 2024	Electricity meters	SA
Metlogic Pty Ltd (PDF 369.1 KB)	33 John Radley Avenue Dural NSW 2158	20 August 2023	Electricity meters	NSW
Energy Queensland Limited (PDF 368.94 KB)	524 Bilsen Road, Geebung QLD 4012	14 September 2023	Electricity meters	QLD
Landis & Gyr Pty Ltd (PDF 391.2 KB)	50 Cyanamid Street Laverton North VIC 3026	16 November 2023	Electricity meters	VIC
PLUS ES (PDF 392.4 KB)	48-50 Holker Street Silverwater NSW 2128	15 February 2024	Electricity meters	NSW
Utility Meter Verification Services (PDF 391.21 KB)	Unit 3, 21 Enterprise Street Cleveland QLD 4163	31 March 2024	Electricity meters	QLD
Secure Meters (Australia) Pty Ltd (PDF 392.3 KB)	39-41 Fennell Street Port Melbourne, VIC 3207	29 November 2023	Electricity meters	VIC
AusNet Transmission Group Pty Ltd (PDF 391.49 KB)	308 Hyde Street YARRAVILLE VIC 3013	18 October 2024	Electricity meters	VIC
EDMI Pty Ltd (PDF 391.92 KB)	162 South Pine Road Brendale QLD 4500	21 March 2025	Electricity meters	QLD

1800 773 851
info@repositpower.com
Unit 17/2 Yallourn St,
Fyshwick ACT 2609
repositpower.com

Independence of standard

NMI is part of Australia's federal government and is the body that implements the Commonwealth's constitutional role as head of power and weights. Standards that are published by the NMI have legislative force and are as independent as Australia's democratically elected leaders.

The IEC61557-12 standard is promoted by large[vi] European[vii] switchgear[viii] manufacturers[ix]. Reposit questions the independence of this standard relative to the independence of NMI published standards.

Cost of standard and impact on this consultation

The nomination of a standard to support FCAS measurement and verification is a key part of this MASS consultation. The nomination of IEC61557-12 by AEMO means a consulted party must be able to consider the relevant parts of this standard.

This requires a consulted party to make an expenditure of $1224.94 for the purchase of the standard from the Standards Australia Store[x]. Reposit considers this expenditure requirement to strongly discourage consulted parties to critically evaluate and provide feedback on AEMO's nomination of IEC61557-12.

Reposit notes that NMI standards are freely available to all parties.

3. Retroactive additional requirements

It is inevitable that applying a certification requirement to in-market FCAS metering will be problematic to any party that is using meters not already certified to the selected standard.

Reducing the application of the standard to power and frequency measurements does reduce the difficulty, but it does not remove it. This is because active power and frequency are both derived quantities from the measurement of voltage and current waveforms. The measurement of voltage and current waveforms is subject to Influence Factors[xi] and Disturbances[xii].

Influence Factors affect meter accuracy and are always tested for under certification regimes. They determine what the allowable accuracy degradation is under changing environmental and electrical conditions that are within the rated operating conditions of the meter. Some typical Influences are:

- Radiated, RF and electromagnetic fields
- Self-heating
- Solar radiation
- Load balance
- Tilt
- Magnetic induction
- Frequency variation

Disturbances are extreme quantities of an Influence that are outside of the rated operating condition of the meter. They are also tested for under certification regimes.

Reposit assumes that Influence factors and quantities from IEC61557-12 will be applied to active power and frequency certification. These factors and quantities are new requirements for existing metering. It does not matter what they are specified to be, they were not specified in any MASS since FCAS market start. Whether a given in-market meter type is able to meet the required accuracy

1800 773 851
info@repositpower.com
Unit 17/2 Yallourn St,
Fyshwick ACT 2609
repositpower.com

under the Influence factors and quantities specified in the selected standard is simply a matter of luck. This is true regardless of the standard chosen.

As a result Reposit considers the retroactive application of any certification requirement to in-market metering to be unworkable where AEMO is committed to the provision of a level playing field for all market participants.

Reposit suggests that all in-market metering should not be subject to retroactive certification. Additionally, AEMO must provide ample time for FCAS participants in the Fast, Slow and Delayed markets to re-engineer and certify metering without impeding FCAS registrations. This should occur for an appropriate period before the selected standard comes into effect. To do otherwise risks energy system security as new FCAS capacity registration will be paused and will be unable to replace retiring fossil fuel generator FCAS capacity.

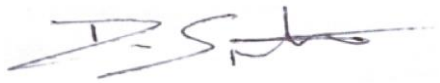
Reposit notes that this issue does not exist for the Very Fast FCAS services as there are no existing providers of Very Fast FCAS.

4. Error introduced by slow sampling rate

Reposit maintains its position that the Tesla/University of Melbourne's statistical treatment of sampling error does not accurately calculate measurement uncertainty from an aggregated fleet. As discussed in multiple submissions already, this approach assumes a Gaussian distribution of error. This is valid for the measurement of physical processes, but the control system of a VPP node is not a physical process and is subject to correlations caused by software, state-of-charge, grid voltage and ambient temperature, among others.

Reposit maintains that NMI scrutiny of AEMO's approach to the calculation of measurement uncertainty is required.

Yours Sincerely,



Dean Spaccavento
CEO
Reposit Power

[i] https://aemo.com.au/-/media/files/stakeholder_consultation/consultations/nem-consultations/2022/amendment-of-the-mass/second-stage/review-of-fcas-metering-test-and-certification-requirements-for-aemo.pdf
[ii] https://www.industry.gov.au/sites/default/files/2019-05/nmi_m_6-1.pdf
[iii] https://www.industry.gov.au/sites/default/files/2022-06/nmi-r-46-1-2-v1-0.pdf
[iv] https://www.industry.gov.au/sites/default/files/2022-06/nmi-m-13-1-v1-0.pdf
[v] https://www.industry.gov.au/regulations-and-standards/australias-measurement-system/utility-meter-verifiers?field_nmi_services_offered_tid%5B%5D=1937&field_nmi_state_territory_tid=All
[vi] https://blog.se.com/power-management-metering-monitoring-power-quality/2016/10/18/understanding-iec-standard-makes-meter-comparisons-easier
[vii] https://it-resource.schneider-electric.com/electrical-infrastructure-power/understanding-the-iec-61557-12-standard-that-makes-meter-comparisons-easier-part-2

1800 773 851
info@repositpower.com
Unit 17/2 Yallourn St,
Fyshwick ACT 2609
repositpower.com

[viii] https://download.schneider-electric.com/files?p_enDocType=White+Paper&p_File_Name=998-19721656_GMA-US.pdf&p_Doc_Ref=998-19721656_GMA-US – See Conclusions and Summary (p. 14)
[ix] https://www.linkedin.com/pulse/before-yesterday-today-measurement-solutions-iec-liam-mccafferty/
[x] https://store.standards.org.au/product/iec-61557-12-2018-amd1-2021-csv - date: 19/8/22
[xi] https://www.industry.gov.au/sites/default/files/2019-05/nmi_m_6-1.pdf - 2.16
[xii] https://www.industry.gov.au/sites/default/files/2019-05/nmi_m_6-1.pdf - 2.10

1800 773 851
info@repositpower.com
Unit 17/2 Yallourn St,
Fyshwick ACT 2609
repositpower.com