



Your Ref: <https://aemo.com.au/consultations/current-and-closed-consultations/review-of-power-system-data-communication-standard>

15 March 2022

Australian Energy Market Operator
Submitted via email to: data.comms@aemo.com.au

Dear Sir/Madam

Submission: Review of Power System Data Communication Standard Issues Paper

CS Energy welcomes the opportunity to provide a submission to the Australian Energy Market Operator's (AEMO's) *Review of Power System Data Communication Standard Issues Paper (Issues paper)*.

CS Energy commends AEMO on the comprehensive, detailed and informative Issues Paper.

About CS Energy

CS Energy is a Queensland energy company that generates and sells electricity in the National Electricity Market (NEM). CS Energy owns and operates the Kogan Creek and Callide B coal-fired power stations and has a 50% share in the Callide C station (which it also operates). CS Energy sells electricity into the NEM from these power stations, as well as electricity generated by other power stations that CS Energy holds the trading rights to.

CS Energy also operates a retail business, offering retail contracts to large commercial and industrial users in Queensland, and is part of the South-East Queensland retail market through our joint venture with Alinta Energy.

CS Energy is 100 percent owned by the Queensland government.

Key recommendations

CS Energy recognises the importance of the Power System Data Communication Standard in providing, maintaining and operating the equipment and systems used in the transmission and receipt of power system data and electronic instructions to and from AEMO control centres. CS Energy also appreciates the contribution of the Standard to maintaining the integrity of the National Electricity Market (NEM) power system. and to NEM Participants in meeting their Rule compliance obligations.

■ **Brisbane Office**
PO Box 2227
Fortitude Valley BC Qld 4006
Phone 07 3854 7777
Fax 07 3854 7300

□ **Callide Power Station**
PO Box 392
Biloela Qld 4715
Phone 07 4992 9329
Fax 07 4992 9328

□ **Kogan Creek Power Station**
PO Box 41
Brigalow Qld 4412
Phone 07 4665 2500
Fax 07 4665 2599

It is an opportune time and proactive approach to conduct the consultation to identify and address key issues that may need to be addressed to support efficient and effective data communication across the range of facilities, services and operational requirements expected to exist in the NEM in the relatively near future.

CS Energy has not quantified to any extent the expected benefits and costs of any proposed solutions in this submission as it believes that it would be appropriate to conduct that analysis and include it in submissions on the Draft Report and Draft Standard.

CS Energy's comments and feedback in response to the matters for consultation identified in the Issues Paper are provided in Attachment A.

Conclusion

CS Energy commends AEMO on its work, both preparing the Issues Paper and engaging with stakeholders.

If you would like to discuss this submission, please contact Henry Gorniak (Market and Power System Specialist) on (07) 3854 7364 or hgorniak@csenergy.com.au.

Yours sincerely

A handwritten signature in black ink, appearing to read 'E. Jones', with a long horizontal flourish extending to the right.

Evan Jones
Market Regulatory Manager

ATTACHMENT A

CS Energy notes and agrees with the issues detailed in section 2.2 *Context for this consultation* of the Issues Paper¹.

CS Energy's comments and feedback in response to the matters for consultation identified in the Issues Paper are provided below.

Section 3.1.1

Does the Standard need to be more specific on the range of data covered by the Standard? If so why and what level of detail is considered necessary?

CS Energy notes that currently the Standard does not itself set obligations as to the data that must be provided to AEMO. Consideration should be given to the inclusion of data requirements that are in addition to obligations set by other provisions in the National Electricity Rules (**NER**), such as access standards.

Does the definition of power system data need to be extended? If so why and what would be a more appropriate definition?

The definition should be extended to include identified requirements reflecting current gaps and anticipated requirements arising from the changing dynamics of the NEM with regular reviews to capture evolving requirements not yet identified.

Does the definition of control commands need to be extended? If so why and what would be a more appropriate definition?

CS Energy supports the development of an updated definition with AEMO initially producing a list of current and expected control commands to be reflected in the updated definition.

Do the definitions of RCE and RME need to be extended? If so why and what would be a more appropriate definition?

As AEMO stated on page 5 of the Consultation Paper, the definitions do not adequately describe the new technology for data acquisition. The new technology for data acquisition should be reconciled with the identified requirements prior to finalising the updated definition.

Other than the changes required to accommodate additional participant categories identified in clause 4.11.1 of the NER, does the Standard need to extend or specify other participants or sub-groups within a category. If so, how and why?

The range of Participants must be reconciled and updated with the requirements of the data communications process and reflect the evolving needs of the NEM power system to ensure the integrity of power system operations.

¹ https://aemo.com.au/-/media/files/stakeholder_consultation/consultations/nem-consultations/2022/review-of-power-system-data-communication-standard/issues-paper.pdf?la=en

Section 3.1.2

Should requirements under the Standard be varied according to how critical the data is? If so, what criteria should be used to determine the requirements particular data needs to meet?

AEMO should consider the development of priorities for the data and group the data accordingly with associated specifications including the management of data outages analogous to outages of primary protection.

Are there examples where AEMO has specified requirements beyond those set in the Standard, and how can any potential inconsistencies best be reconciled?

CS Energy would support the inclusion of identified legitimate requirements beyond those set in the Standard to ensure that it remains fit for purpose. Refer to comments above.

Are there examples where the Standard has not kept pace with developments in data communications technology?

This is a key challenge for both AEMO and Participants to ensure the Standard is reconciled with developments in data communications technology and the requirements keeping pace with evolving NEM developments.

Is there an opportunity for the standard to encourage enhancement of resilience through design? If so, how might this be done?

CS Energy supports the proactive approach proposed by AEMO. Security and resilience are arguably non-negotiable risks.

Section 3.1.3

What changes to the current Standard are required to clarify the requirements for DNSPs?

CS Energy recognises the integral role of the Distributed Network Service Provider (**DNSP**) in the NEM. AEMO has highlighted the key relevant points. The key will be developing a consistent approach across the NEM for all Participants and update the Standard accordingly.

Are there specific examples where the current data communications structure is making it difficult for new connections or embedded participants? If so what changes in the Standard would be required to address these issues?

Refer to comments above. The key is to avoid surprises arising from the requirements in the Standard or where the Standard is silent on a matter, not imposing additional requirements on the connecting party.

What difficulties are wholesale demand response providers finding to be connected for data communications under current arrangements?

At this stage, CS Energy offers no comments as it has no meaningful exposure to the area.

What difficulties do DNSPs have in communicating AGC control signals?

The Standard is required to be fit for purpose to enable the DNSP to either modify or to ensure the inclusion of requirements in upgraded DNSP Energy Management System (EMS). Based on the current assessment of some DNSPs, there may have to be a transitional period to enable DNSPs to meet the requirements of an updated Standard.

Section 3.1.4

Is the current ICCP Protocol specified in the current Standard still appropriate?

Arguably the Standard is appropriate and AEMO needs to answer the above statement regarding security of protocol and how it contributes to the resilience delivered by the Standard. However, it would be beneficial for AEMO to provide definitive guidelines for the implementation of Inter-Control Centre Communications Protocol (**ICCP**) / secure ICCP.

What protocols should apply for connections to AEMO WAM?

The protocols should be consistent and applicable to all parties connecting to the AEMO Wide Area Network (**WAN**). A compelling case would have to be presented to deviate from the protocols including an assessment of the risk arising from the deviation.

Section 3.1.5

What additional detail is required in the Standard to provide more clarity on boundary of both operational and financial responsibilities?

CS Energy agrees with the requirement for clarity as proposed. The framework should include the protocols for the boundaries and should be overlaid with revised Standard. The key is to ensure that the operational and financial responsibilities are applied consistently across all boundaries and parties. It should be clear what is the responsibility of the generator, and what is the responsibility of the Transmission Network Service Provider (**TNSP**). Many new generators are unclear on what it is they need to do to connect to AEMO, and the TNSP has been guiding them through the process.

Should an obligation for parties to work together be added to the Standard?

CS Energy supports the formalisation of the obligation of parties to work together to resolve any problems to ensure a requirement is met however would not support a heavily rigid dispute resolution framework.

Does the Standard need to clarify that connection is required to both AEMO control room sites?

Yes. CS Energy queries whether it should also include backup sites.

Section 3.1.6

Should the Standard include a specific requirement that data sent should be of good quality? If so, what would be implications for stakeholders?

Yes. The impact of poor-quality data may under certain circumstances lead to system security concerns and in the worst-case scenario lead to Market Suspension. The key will be to ensure the standard is set so as to avoid outcomes detailed in AEMO procedure

SO_OP3706 MARKET SUSPENSION AND SYSTEMS FAILURE². Accountability for ensuring the data quality between generators and TNSPs should also be clarified.

Should all data be sent with quality flags? If so, what would be implications for stakeholders?

Yes, and those quality flags should reconcile with AEMO quality flags. This may require a transitional period to allow sufficient time to implement the requirements.

Section 3.1.7

Should the Standard include a more specific requirement regarding data accuracy? If so, what would be implications for stakeholders?

Yes. There is need to develop a standard regarding the data accuracy that reflects the requirement and risk. This may require a transitional period to allow sufficient time to implement the requirements.

How material is the issue regarding clamping of values for semi-scheduled units? If the standard were to be changed as suggested, what would be the implications for participants?

Section 3.1.8

Should the Standard include a specific requirement regarding data latency? If so, what would be implications for stakeholders?

Yes, as data latency compromises the requirements and the purpose of the data function. This may require a transitional period to allow sufficient time to implement the requirements.

How material is the issue regarding timing differences due to RME? If the standard were to be changed to address this, what would be the implications for participants?

The conversion time may contribute to latency outcomes and should be addressed and standardised. This may require a transitional period to allow sufficient time to implement the requirements.

Should an additional requirement be included in the Standard to allow ongoing monitoring of end-to-end response times? If so, what would be the implications of such a change?

An assessment of the risk and a cost benefit analysis will need to be conducted to understand the implications and the requirements arising from an updated Standard.

CS Energy supports in principle the proposal but seeks to have access to the out workings arising from the above.

Section 3.1.9

What would the implications be if the specification of maximum delay for control commands was tightened to 2 seconds? What are the implications if control command delays remain at current levels?

² https://aemo.com.au/-/media/files/electricity/nem/security_and_reliability/power_system_ops/procedures/so_op_3706-failure-of-market-or-market-systems.pdf?la=en

CS Energy has provided the following input to the Primary Frequency Response (PFR) and associated processes that details concerns with the current AGC process and the flow on effects.

- AEMO's dispatch conformance alert system is yet to align with the Primary Frequency Response (**PFR**) rule changes made under the 'Removing disincentives to providing PFR' rule change process that are intended to clearly legitimise being off target to help correct frequency. Traders continue to receive "Off Target" alerts despite PFR contributing to a significant portion of the "MW Error" in AEMO's dispatch compliance system due to (a) the discrepancy between the "Total Cleared" in AEMO's Automatic Generation Control (**AGC**) system and the actual AGC setpoints seen by generators when PFR provides a head start to load ramping, and (b) PFR itself still being included in the "MW Error", which is simply "Total Cleared" minus "Actual MW". (see Figure 2). This then potentially impacts subsequent decisions.
- Participants do not receive a linear AGC setpoint ramp. This appears to be principally due to resetting the "Total Cleared MW" to "Actual MW" at the start of each Dispatch Interval (**DI**). The resultant flat spots in AGC ramps at DI boundaries if "Actual MW" is lagging an AGC setpoint ramp before the start of the DI, and the inconsistent ramp rate between DIs is directly responsible for degrading the ramping response of generators.
- The AGC setpoint ramping should not be reset to Actual MW every DI, rather it should just continue from the AGC setpoint at the end of the previous DI with no pause. In this way, it would be decoupled from any PFR influence. Unlike AGC setpoint changes, PFR is not rate limited and should not be allowed to alter the base AGC setpoint ramping. If the reason for resetting "Total Cleared MW" to "Actual MW" at the start of each DI is because the energy market dispatch engine does not account for the influence of frequency deviations on system load, then AEMO needs to model the frequency influence on load and generation and factor into the dispatch an estimate of the change in generation needed to correct frequency.
- The non-linearities in AEMO's AGC setpoint ramping distort the legitimacy of any causer-pays framework. Causer pays performance factors are judged by comparing actual MWs against a linear trajectory between dispatch targets, whereas they should be judged against the AGC set points as received by the generator and that are sent back to AEMO with the actual MWs.

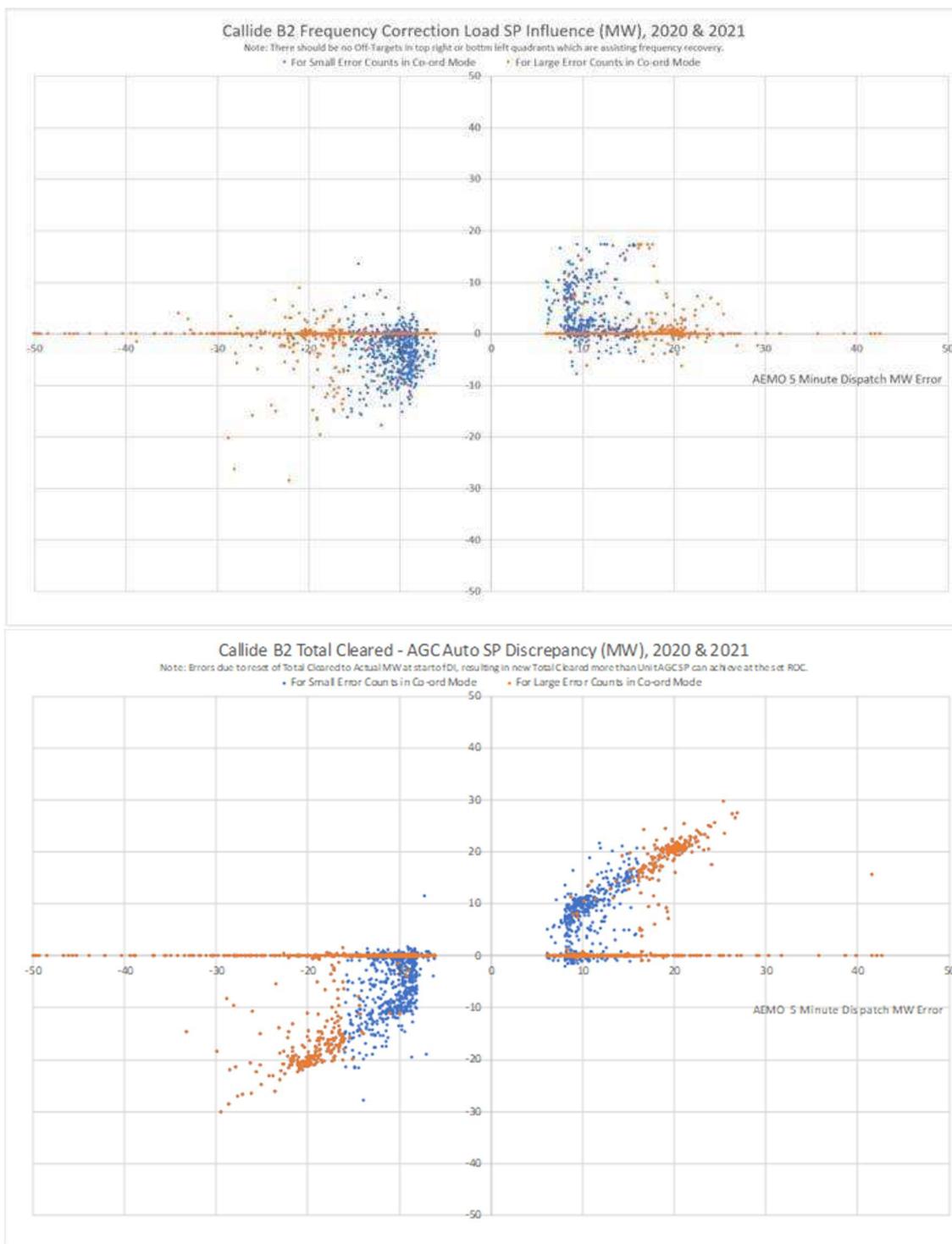


Figure 2 PFR influence on AEMO 5 Minute Dispatch MW Error.

There is strong case to push strongly for the DSCP response to be measured against each unit’s rate limited AGC target, which is send back to AEMO together with the actual load. This would also avoid timing discrepancies between the two principal values being compared, which could otherwise be another significant source of error. Why assume a linear trajectory when the trajectory is precisely known at the same time as each load measurement? Using the unit’s AGC setpoint may incentivise AEMO to update its AGC system to include a linear ramp as the non-linear AGC setpoint ramping causes sub-optimal unit control by pushing rate of change feed-forward influences in and out.

For units that are dispatched for Regulation FCAS, measuring against the unit's AGC setpoint would measure their PFR response independently from their regulation AGC response, thus decoupling DSCP payments for PFR from existing payments for Regulation FCAS. That would remove any objection around 'double dipping'. At present, good or bad Regulation FCAS response is neither rewarded nor penalised.

Is there a material issue associated with reliability of the connection to AEMO's market portal?

Yes, and CS Energy is supportive of addressing the identified concerns around reliability of the connection to AEMO's market portal.

Should the specification of control command delays in the Standard take into account the number of intervening facilities? If so, how should these be accounted for and what would the implications be?

Any requirements regarding maximum delays would ideally take into account the number of intervening facilities through which the command signal needs to be relayed and the final requirement in the Standard would ideally be reflective of rigorous cost benefit analysis.

Section 3.1.10

What specific obligations regarding maintenance of security should be included in the Standard, and what would be the implications of this?

Clarity on obligations of the parties about the security of the data (physical, personnel and cyber) and of control protocols at the level required for critical infrastructure is required and would ideally be captured in the Standard.

Does the legislation adequately cover security obligations and requirements or is there a need for more detailed obligations in the Standard?

CS Energy supports the principles being codified in the regulations and the detailed security obligations and requirements being specified in detail in the Standard.

What would be the implications of including a specific obligation to advise on cyber security risks?

CS Energy considers that the obligations imposed on Participants in Rule 4.8.1 (Registered Participants advice³) already requires Registered Participants to provide advice to AEMO on cyber security risks and incidents.

Should the Standard be enhanced to better identify and support the protection of the confidentiality of data? If so what type of enhancement is required?

CS Energy supports the protection of the confidentiality of data where appropriate.

³ <https://energy-rules.aemc.gov.au/ner/379/95102#4.8>

Section 3.1.11

Does any lack of redundancy currently restrict the ability of participants to apply software security patches in a timely manner?

The requirement and subsequent obligation should reflect good operating practice and current best practice.

Section 3.1.12

What change to Section 2.2 of the Standard would be required to clarify the requirement for adequate notice?

An assessment of the risk that the requirement is managing in addition to clarification of changes that require notification is required to determine what is adequate notice.

Section 3.1.13

What issues have arisen that would justify including in the Standard a specific requirement regarding response time to forced outages? If so, what would reasonable expectations be?

CS Energy proposes that a process reflecting the requirements detailed in the Rule 4.6.5 (Partial outage of partial protection systems⁴) with the details required to give effect to the requirements in AEMO procedure SO_OP 3715 Power system security guidelines⁵.

Section 3.1.14

What issues have arisen that would justify expanding the scope of testing specified in the Standard? If so, what increases in scope are required? What would be the implications of a change in testing scope?

In addition to the 'quality flags' discussed previously, testing is a key risk management measure and is required for maintenance of the integrity of the process and Standard.

What changes to the definition of an "upgrade" is required? What implications would such a change have?

There is need to define a material change with an appropriate threshold.

Should section 6.4(c) of the current Standard be amended to encourage use of standard test procedures?

Standardisation of test plans is an efficient proposal provided that there is an appropriate level of detail so as to avoid any ambiguity.

What issues have arisen that would justify the Standard specifying the provision of testing environments for data links? What implications for stakeholders would such a new requirement have?

CS Energy considers that it is essential to provide testing environments for data links. The implications will become apparent when the test scope and environment is finalised.

⁴ <https://energy-rules.aemc.gov.au/ner/379/95092#4.6>

⁵ https://aemo.com.au/-/media/files/electricity/nem/security_and_reliability/power_system_ops/procedures/so_op_3715-power-system-security-guidelines.pdf?la=en

Section 3.1.15

In what circumstances would transitional provisions be justified for increased requirements in the Standard? If justified, what form of provisions would be needed and for how long?

As highlighted in previous responses, a number of the developments will require transitional periods. The duration will be reflective of the risk.

Section 3.2.1

Does the Standard need to cover to cover PMU and HSM data? If so why and on what basis should the requirements be set (i.e. appropriate standards on which the requirements could be based)?

Yes, if deemed integral to power system security.

Does the Standard need to cover SGAs? If so why and on what basis should the requirements be set?

Yes, and it must reconcile with the Market Ancillary Service Specifications (MASS) and other relevant specifications to ensure consistency of approach and avoid the emergence of loopholes.

Is it likely that future changes to the Standard will be required to also cover provision of real time data from AEMO to participants?

CS Energy supports the regular review of the Standard that reflects a proactive rather than a reactive approach.

Are there any specific factors AEMO should take into account in assessing the costs and benefits of a proposed enhancement to the requirements of the Standard?

The NEO principles should be applied to ensure that the costs and benefits are appropriate.