



21 April 2017

Australian Energy Market Commission  
PO Box A2449  
Sydney South NSW 1235

**RE: EPR0053 – System Security Market Frameworks Review**

The South Australian Chamber of Mines and Energy (“**SACOME**”) welcomes the opportunity to provide general industry feedback on the System Security Market Frameworks Review directions paper. South Australia is undergoing an energy transition where incumbent generation and frequency services are being replaced by new sources with no assessment on system security or reliability.

The following document outlines SACOME’s response to the two packages and associated actions the directions paper has proposed with respect to inertia and fast frequency response. SACOME is generally supportive of market mechanisms that incentivise the service of inertia and frequency response to enhance the robustness of the SA system.

As outlined in the attached submission the delivery of inertia services by transmission network service provider (“**TNSP**”) as mandated by limits set by the Australian Energy Market Operator (“**AEMO**”) is a good solution, however the rules that govern the market to procure and incentivise these services needs to be clearly defined before industry can review the full impact of the rule changes.

SACOME recommends that the rules to be released on 29 June 2017 should closely look at how a market will operate to manage financial risk and liabilities for TNSPs to ensure that the purpose of incentivising these services is not inhibited by regulatory restrictions.

Yours Sincerely,

A handwritten signature in black ink, appearing to read "Dayne Eckermann".

Dayne Eckermann  
Senior Policy Advisor

A handwritten signature in black ink, appearing to read "Nigel Long".

Dr. Nigel Long  
Director, Industry & Government Advocacy

**SACOME**

The South Australian Chamber of Mines and Energy (SACOME) is the peak industry association for all companies with business interests in the resources industry in South Australia, including those with business, vocational or professional interests in minerals exploration, mining and processing, oil and gas exploration, extraction and processing, power generation, transmission and distribution, logistics, transport, infrastructure, and those with clients in these sectors.

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**South Australian Chamber of Mines and Energy**

## **EPR0053 – System Security Market Frameworks Review**

Submission to

**Australian Energy Market Commission**

**April 2017**

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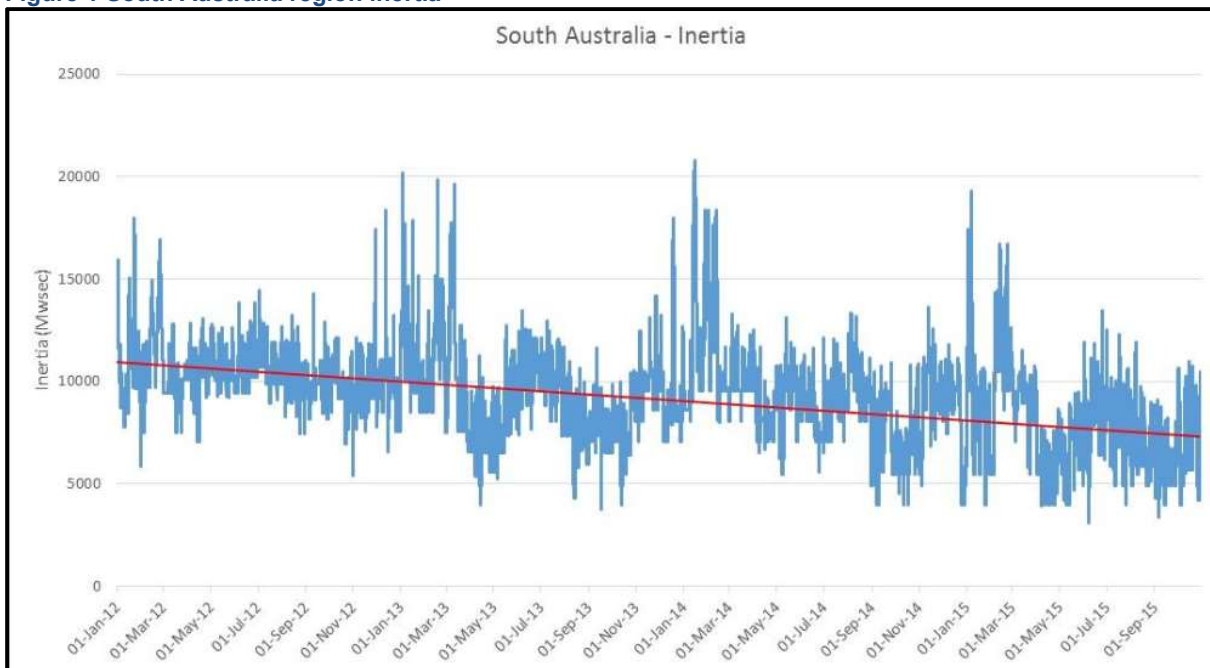
## Introduction

The South Australian Chamber of Mines and Energy (“**SACOME**”) welcomes the initiative by the Australian Energy Markets Commission to establish the System Security Markets Framework Review. System security and strength are two key issues facing the South Australian network.

SACOME supports the initiative to review a series of rule changes as a package under the auspices of system security. The intermediate package to address immediate issues in the National Electricity Market (“**NEM**”) is timely and will assist South Australia to manage the imbalances caused by the loss of synchronous generation.

There has been 1,025MW of retired thermal generation in South Australia<sup>1</sup> and an addition of approximately 2,000MW of non-synchronous inverted connected generation since 2000. The introduction of this form of generation has decreased the available levels of inertia in the South Australian system (see Figure 1).

**Figure 1 South Australia region inertia**



The decline in overall system inertia has increased the likelihood of high rate of change of frequency (“**RoCoF**”) events particularly when the SA network is disconnected from the NEM and there is a high level of non-synchronous generation operating. At the time of the September 2016 system black there was no determined risk of separation and the resultant RoCoF standards and constraint equations were not invoked which may have assisted in resisting the deviation.

The need to incentivise system services to assist in the maintenance of adequate frequency and inertia levels is critical for South Australia that has a further 102MW of committed and 4,054MW of planned non-synchronous generation<sup>2</sup>. The deployment of this generation will

<sup>1</sup> (Australian Energy Market Operator, 2017)

<sup>2</sup> (Australian Energy Market Operator, 2017)

cause larger frequency deviations in low inertia situations<sup>3</sup>. The proposed packages and initiatives are necessary to incentivise further services that can respond or delay radical changes in system stability that result in adverse outcomes for consumers and suppliers.

### **Immediate and subsequent packages**

SACOME recommended in its submission to the independent review into the future security of the National Electricity Market (“**Finkel Review**”) that there is an initial assessment of system strength and security to determine safe operating levels of inertia. This ensures RoCoF events are resisted adequately to allow Fast Frequency Response (“**FFR**”) services to prevent load shedding. There is general support for these packages with the following sections outlining aspects AEMC should consider in the rules to be released in June 2017.

### **Inertia operating level**

The required operating level of inertia that is to be assessed by AEMO is an appropriate component of the packages to determine the lowest level of inertia that a system requires to adequately meet frequency standards.

The level should be assessed regularly by AEMO and open to review by expert third parties to ensure that it is set at an appropriate level and has taken all factors into account for a respective market in the NEM.

This will ensure that TNSPs will be operating to a limit set by AEMO that is robust and dynamic to ensure system stability. The limit set by AEMO is critical to determine the level of procurement these TNSPs will have to undertake. It will also be the level that new non-synchronous generators will have to provide FFR services for.

### **Procurement of Fast Frequency Response services**

The directions paper outlines the procurement that will be undertaken by the TNSPs, however there is no detail on the rules for how they will be able to procure the services. TNSPs have obligations and rules under the NEO and NEM rules, overseen by the Australian Energy Regulator (“**AER**”).

SACOME is generally supportive of the market mechanisms proposed, however in consultation with members several factors will need to be addressed for the industry to determine the actual impact of the proposed package. Detail on the rules is essential to determine the market structure, liquidity in the market, how TNSPs will fund the procurement, incentives and liabilities.

Funding arrangements are particularly important as this will determine where and how the funding will be sourced for TNSPs whose OPEX and CAPEX are regulated by the AER, and subsequently flow through to consumers in the network. If the funding avenues are too restrictive it may cause TNSPs to seek the cheapest option of FFR, which is load shedding. For SACOME members this can cause risks to personnel and plant, unacceptable interruptions to production, and material disruptions that endure for a prolonged period after the outage. For

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<sup>3</sup> (Ulbig, 2014)

example, a 35 minute outage in November 2016 caused an hour-long outage after power was restored for a SACOME member at a large cost.

### **Fast Frequency Response services**

There is a trade off as noted in the directions paper between the minimum level of inertia, FFR services and cost to the consumer. While all scenarios can potentially be mitigated, this will come at a high cost to the consumer.

Under Frequency Load Shedding (“**UFLS**”) systems are the cheapest FFR system to deploy for TNSPs, but they do come at the expense of the consumer’s business that depends on a consistent flow of electricity. Batteries, synchronous condensers and generators providing FCAS are other forms of FFR that can react to frequency deviations, but will require an adequate level of inertia to be able to effectively deploy.

The intention to establish an open market to procure FFR services is welcomed, though it will be critical to assess the varying levels of inertia set by AEMO against the market to determine what FFR services would become available. New entrants into a system will impact on how the system operates overall and this will need to be tested to ensure that the system feedback is not detrimental.

### **Generator obligations for FFR capability**

SACOME is supportive of measures that place obligations on new non-synchronous generation to provide or procure FFR services. As noted in the introduction South Australia has had a large increase in non-synchronous generation in the network that now comprises 42.2% of total generation<sup>4</sup>.

The Essential Services Commission of South Australia (“**ESCOSA**”) is presently undertaking a review of the standards for non-synchronous generation<sup>5</sup>. A new market to procure FFR would complement a requirement for new non-synchronous generation to provide these services to maintain system strength. This market would require further detail to ensure adequate and effective FFR services are procured.

### **Conclusion**

Low inertia due to the penetration of non-synchronous generation is an acute problem for South Australia. Changes to the NEM Rules are needed to arrest the decline in system strength in South Australia. SACOME is generally supportive of the market mechanisms outlined in the directions paper. However, further clarity is needed on the rules for SACOME and TNSPs to adequately assess the impact a new market for FFR services will have. The determination of the inertia limit, market dynamics and system feedback are all critical components to assess the impact of the proposed rule changes.

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<sup>4</sup> (Australian Energy Market Operator, 2016a)

<sup>5</sup> (Essential Services Commission of South Australia, 2017)

## Bibliography

Australian Energy Market Operator. (2016a). *South Australian Electricity Report*. Melbourne: AEMO.

Australian Energy Market Operator. (2017, February 27). *Generation Information*. Retrieved from <https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Planning-and-forecasting/Generation-information>

Essential Services Commission of South Australia. (2017). *Inquiry into licensing arrangements under the Electricity Act 1996 for inverter-connected generators*. Retrieved from ESCOSA: <http://www.escosa.sa.gov.au/projects-and-publications/projects/inquiries/inquiry-into-licensing-arrangements-for-inverter-connected-generators>

Ulbig, A. B. (2014). *Impact of low rotational inertia on power system stability and operation*. Zurich: Power Systems Laboratory, ETH Zurich.