

## System Control – Secure System Guidelines

### Consultation Feedback Assessment (Review Submissions)

#### Summary of issues raised in submission and organisations represented in stakeholder consultation process.

The second stage of submissions was conducted between Monday 22 May 2017, 0800 hrs and Friday 2 June 2017, 1400 hrs. During this time submissions were received from the following organisations:

- Territory Generation (TGEN)

Two late submissions to the consultation were received from the following organisations:

- Jacana Energy (Jacana)
- Epuron Solar (Epuron)

System Control has determined to accept Jacana’s late submission on the basis that their Manager – Regulation and Industry Development was unaware of the 1400 hrs deadline, as outlined in Jacana’s justification response. System Control has determined to accept Epuron’s late submission on the basis that a clerical error by System Control resulted in Epuron not receiving notice of this consultation and missing the first stage of submissions entirely.

The Market Operator has published online the following documents:

- System Control’s response to review submissions (this document)
- Secure System Guidelines Draft 3.2
- Secure System Guidelines Version 4
- Table of heading changes from Draft 3.2 to Version 4

**Table 2** addresses the issues raised by System Participants in detail. It should be noted that the responses provided in this document are made by Power and Water Corporation in respect to the System Control license. Acronyms and associated expansions used in this document are as follows:

**Table 1: Acronym Expansions**

FCAS	Frequency Control Ancillary Service <sup>1</sup>
IAS	Inertia Ancillary Service <sup>2</sup>
PSC	Power System Controller
PCPS	Pine Creek Power Station
RoCoF	Rate of Change of Frequency
UFLS	Under Frequency Load Shed
DTF	Department of Treasury and Finance

R-FCAS	Regulation Frequency Control Ancillary Service
I-FCAS	Inertia Frequency Control Ancillary Service
C-FCAS	Contingency Frequency Control Ancillary Service
SCTC	System Control Technical Code
FFR	Fast Frequency Response (Term used in Finkel Review)
AEMO	Australian Electricity Market Operator
NEM	National Electricity Market

<sup>1</sup> FCAS is the term used throughout the secure system guidelines draft 3 and 3.1; this is corrected to Contingency FCAS (C-FCAS) in draft 3.2. This was updated for clarity as the Contingency FCAS is a subset of the FCAS services. See response below for further details.

<sup>2</sup> IAS is the term used throughout the secure system guidelines draft 3 and 3.1; this is corrected to Inertia-FCAS (I-FCAS) in draft 3.2. This was updated for clarity as the Inertia-FCAS is a subset of the FCAS services. See detailed response for further information.

Table 2: Detailed Response to Issues

Stakeholder	Issue (Numbered)	System Control Response		
TGEN	<p><b>Issue #23</b></p> <p>TGEN continues to have some reservations as to whether the proposed changes will deliver the best outcomes for the Northern Territory. TGEN restates its recognition of the importance of System Control having processes at its disposal to maintain a secure system.</p> <p>The Power System Controller's right to instruct System Participants to provide <i>ancillary services</i> is governed by section 5 of the SCTC and, in particular, is limited by:</p> <ul style="list-style-type: none"> <li>the declared operating limits of the relevant plant; and</li> <li>the definition of <i>ancillary services</i>.</li> </ul> <p>The definition of <i>ancillary services</i> in Attachment 1 of the SCTC is expressed to be exclusive - i.e. <i>ancillary services</i> are [only] the following services provided by <i>Generators</i> or other <i>System Participants</i>:</p> <ul style="list-style-type: none"> <li><i>voltage control</i>;</li> <li><i>reactive power control</i>;</li> <li><i>frequency control</i>;</li> <li><i>black start capability</i>.</li> </ul> <p>It follows that a service which does not fall within one of these specific categories of service is not an <i>ancillary service</i> for the purposes of the SCTC. It also follows that if the Power System Controller wished to expand the services that are to be treated as <i>ancillary services</i> for the purposes of the SCTC, it would need to amend the SCTC.</p>	<p>System Control provides two responses to this issue:</p> <p>1) SCTC Section 5.1 provides a non-restrictive list of ancillary services which does not exclude other ancillary services. Although contrary to the definition in SCTC Attachment 1, other ancillary services can exist as per the rules of interpretation set out in SCTC Section 1.4:</p> <p><b>1.4 INTERPRETATION</b>          (a) In this Technical Code, words and phrases are defined in Attachment 1 and have the meanings given to them in Attachment 1, unless the contrary intention appears.</p> <p><b>5.1 ARRANGEMENTS FOR THE PROCUREMENT OF ANCILLARY SERVICES</b>          The Power System Controller shall develop a regulatory mechanism for the procurement and responsibility for ancillary services, including:</p> <p>(a) voltage control services;</p> <p>(b) frequency control services; and</p> <p>(c) black start services.</p> <p>In developing the regulatory mechanism for the procurement of ancillary services, the Power System Controller shall consult with relevant System Participants and the Utilities Commission.</p> <p><b>ATTACHMENT 1 GLOSSARY OF TERMS OF THE CODE</b></p> <table border="1" data-bbox="1108 938 2101 1062"> <tr> <td data-bbox="1108 938 1361 1062"><b>Ancillary services</b></td> <td data-bbox="1361 938 2101 1062">Refers to the following services provided by <i>Generators</i> or other <i>System Participants</i>: <i>voltage control</i>, <i>reactive power control</i>, <i>frequency control</i>, and <i>black start capability</i>.</td> </tr> </table> <p>2) The Inertia Ancillary Service is fundamentally a subset of the Frequency Control Ancillary Service and thus is not contrary to the definition in attachment 1 of the SCTC.</p> <p>This however raises an issue of clarity within the Secure System Guidelines. Fundamentally the contingency services (nominally called FCAS), regulating service and inertia service are all subsets of frequency control ancillary service (FCAS). System Control intends to review and clarify the usage of FCAS, IAS and Regulating Reserve used throughout the Secure System Guidelines prior to final publication.</p>	<b>Ancillary services</b>	Refers to the following services provided by <i>Generators</i> or other <i>System Participants</i> : <i>voltage control</i> , <i>reactive power control</i> , <i>frequency control</i> , and <i>black start capability</i> .
<b>Ancillary services</b>	Refers to the following services provided by <i>Generators</i> or other <i>System Participants</i> : <i>voltage control</i> , <i>reactive power control</i> , <i>frequency control</i> , and <i>black start capability</i> .			

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TGEN	<p><b>Issue #24</b></p> <p>The current Secure System Guidelines expressly recognise that if there is an inconsistency between the SCTC and the Secure System Guidelines, then the SCTC will prevail.</p> <p>For example, if the SCTC states that only certain services are <i>ancillary services</i> and the Secure System Guidelines states that other services (outside of the definition of <i>ancillary services</i>) are also to be treated as <i>ancillary services</i>, then the SCTC will override the Secure System Guidelines to deal with this inconsistency. It follows that the SCTC need to line up with the Secure System Guidelines in order for the documents to work together.</p>	<p>Refer to response to <b>Issue #23</b>; the SCTC definition is inconsistent with its usage within section 5.1 of the SCTC. Regardless, the Secure System Guidelines usage of Inertia Ancillary Service does not contradict either definition. System Control will adjust wording as required for clarity.</p>
TGEN	<p><b>Issue #25</b></p> <p>It is clear that the proposed 'inertia ancillary service' does not constitute <i>voltage control</i>, <i>reactive power control</i> or <i>black start capability</i>. The only category that could potentially apply to the inertia ancillary service is <i>frequency control</i>.</p> <p>This term is not defined in the SCTC. However, at a National Electricity Market level, it is clear that inertia does not currently form part of any of the frequency control ancillary services. As you are aware, the AEMC is currently considering whether inertia should be classified as a new market ancillary service under the NER.</p> <p>Given the intention to move toward the NEM arrangements it would be premature to include this service prior to this being finalised in the NEM.</p>	<p>The Power System Controller fulfils a role in the NT regulated power systems that has some similarities to AEMO in the NEM, however is governed by the Electricity Reform Act and the System Control Technical Code.</p> <p>As outlined in System Control's response to <b>Issue #3</b> of the first stage of submissions: In December 2014, the Power System Controller introduced a requirement for a minimum number of (relatively) high inertia generators to be online at all times in the Darwin-Katherine power system. This change, in conjunction with related changes, has resulted in a dramatic reduction in under frequency load shed events since. Subsequent analysis has validated the changes showing that the Darwin-Katherine power system is very much inertia constrained. The explicit instruction of Inertia Frequency Control Ancillary Service is seen by the PSC as a means of quantifying the inertia requirements without being generator unit or technology specific and to allow for future changes. The PSC believes that introduction of formal inertia requirements in the NT regulated power systems is overdue.</p>

TGEN	<p><b>Issue #26</b></p> <p>The initial price for <i>ancillary services</i> in Attachment 6 of the SCTC was a 'placeholder rate'. That price, along with the scope of the ancillary services required in the Northern Territory, was to be reviewed by the Power System Controller within six months of commencement of the amended SCTC (i.e. by November 2015) and a determination subsequently made to ensure that <u>the price properly reflected the actual cost to TGen in providing those services.</u></p> <p>This requirement was included as a condition by the Utilities Commission on approving the amended SCTC in May 2015. We understand that this review has not been progressed because up until now there has only been one <i>Generator</i> supplying electricity to retailers in the Darwin-Katherine Region (i.e. TGen). However from 1 June 2017 this is no longer the case. The entry of a new Generator into the Darwin-Katherine market together with the Power System Controller's proposal to require TGen to supply additional services as '<i>ancillary services</i>' without any increase in the ASPrice means that this review needs to be completed as a matter of urgency.</p> <p>From the perspective of good regulatory practice, these review should be completed prior to any increase in the scope of ancillary services under the SCTC.</p> <p>The current proposal raises the likelihood that TGen will be effectively subsidising other <i>Generators</i> because:</p> <ul style="list-style-type: none"> <li>• TGen will be required to provide more than its fair share of services to support power system security; and</li> <li>• TGen will be paid far less than its cost of providing these services.</li> </ul> <p>Without an ancillary service price that reflects the costs incurred by TGen in providing the service, TGen will be subsidising the costs of any other Generator operating and selling electricity in the Darwin-Katherine region. Also, the price in Attachment 6 of the SCTC was only intended to cover the defined <i>ancillary services</i>. The Power System Controller is now seeking to expand the scope of these services.</p> <p>Good regulatory practice and the requirements of clause 3.5.4 of the SCTC would require an ASPrice that at least recovers the costs incurred in providing these additional services. It is clearly inappropriate for a price to be fixed simply by notice without any proper consultation at a level of \$0.</p>	<p>The Utilities Commission website has the SCTC published with the following note<sup>3</sup>:</p> <p>In accordance with clause 27A(3) of the Electricity Networks (Third Party Access) Code (“the Code”), the Commission hereby approves the amended System Control Technical Code, version 5.0, effective 27 May 2015.</p> <p>In accordance with clause 19 of the System Control licence issued to Power and Water Corporation (PWC), the Commission requests that PWC commence a review of ancillary services within six (6) months, including the adequacy of such services to ensure the system operates reliably, safely and securely. On completion of the review, the Commission will make a determination relating to the prices for providing ancillary services in accordance with section 3 of the Utilities Commission Regulations and section 22 of the Utilities Commission Act.</p> <p>The note requires commencement of the review within 6 months, by November 2015. TGEN and other participants have been consulted and briefed as part of this review. The changes to Section 5, 6 &amp; 7 of the secure system guidelines are a direct result of this review. System Control is working with Department of Treasury and Finance to unbundle ancillary services as part of the market reform. The requirement to provide inertia to cover a single credible contingency as outlined in this consultation is intended to reform the Frame 6 requirement in the current spinning reserve policy in a technology agnostic manner; it is not a new ancillary service. As noted in response to <b>Issue #23</b>, the inertia ancillary service has been clarified as being within the definition of frequency control ancillary service.</p> <p>System Control is unaware of the subsequent determination by either the Utilities Commission or any other party to ensure that “the price properly reflected the actual cost to TGEN in providing these services”. System Control has been actively working with Department of Treasury and Finance to “unbundle” the cost of ancillary services in line with market reform agenda.</p> <p>The rate a new generator pays TGEN for ancillary services set out in SCTC A6.11(b) was determined on the presumption that all ancillary services are provided by TGEN not by the new generator. Ancillary services are currently bundled in the wholesale energy tariff paid to TGEN. The stated value was included in the May 2015 changes made to the SCTC and thus subject to consultation with the industry. The Market Operator stated the intention during this secure system guidelines consultation (response to <b>Issue #2</b> of the first stage of submissions) to set the ASPrice to zero when there is a separation event and Pine Creek Power Station is controlling the frequency for the islanded system that it is operating in. This is on the basis that TGEN are not providing the frequency control of the islanded system, rather Pine Creek Power Station is. Thus, the market operator has deemed it appropriate that Pine Creek Power Station does not pay TGEN for ancillary services provided by TGEN when Pine Creek Power Station is providing ancillary services. (i.e. during separation events).</p>
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Stakeholder	Issue (Numbered)	System Control Response
Jacana	<p><b>Issue #27</b></p> <p>We note that participants in their submissions to the consultation expressed some concerns with PSC's proposal to implement an Inertia Ancillary Service (IAS) requirement; in particular, that the benefits and costs of the proposal had not been adequately articulated. We agree with these views and consider that in the absence of a cost benefit analysis it is unclear whether an IAS requirement will best achieve the Government's broader policy objectives.</p> <p>While Jacana Energy does not have an 'in principle' objection to IAS as a mechanism for managing system security it is unclear whether other alternatives have been explored that could lower the overall costs of managing a secure and reliable network or electricity consumers.</p>	<p>Please refer to System Control's response to <b>Issue #3</b> from the first stage of submissions regarding cost/benefits of Inertia and Contingency Frequency Control Ancillary Services.</p> <p>Please refer to System Control's response to <b>Issue#25</b> in this document regarding the need for Inertia Frequency Control Ancillary Service. The Power System Controller sees inertia as a fundamental requirement to frequency control.</p>
Jacana	<p><b>Issue #28</b></p> <p>We also note that questions of how much the cost of ancillary services will change under the proposed new arrangements and 'who pays' are not addressed in this consultation. These are important questions that will need to be consulted on with stakeholders.</p>	<p>Please refer to System Control's general response to submissions on the Page 2 of the first stage of submissions:</p> <p style="padding-left: 40px;">For Darwin – Katherine the current analysis of FCAS and IAS in the secure system guidelines results in approximately the same requirement as the existing Spinning Reserve, with the difference that it is more accurate and will be appropriately allocating the amount of frequency control required.</p> <p>As there is little quantitative change in requirements, the cost change is not expected to be significant.</p> <p>System Control is proposing a technical change to the way frequency control ancillary services are defined, quantified and dispatched. The issues surrounding 'who pays' is seen by system control as part of the market reform agenda driven by Department of Treasury and Finance.</p>

<sup>3</sup> Source URL: <http://www.utilicom.nt.gov.au/Newsroom/Lists/Posts/Post.aspx?ID=194>

Stakeholder	Issue (Numbered)	System Control Response
Jacana	<p><b>Issue #29</b></p> <p>Jacana Energy acknowledges the problem of rapid RoCoF arising from system disturbances in the DKIS system needs to be addressed. Jacana Energy supports the investigation of all solutions, in addition to than increasing the level of inertia, are worth exploring with the objective of achieving optimal system security and minimising overall costs to electricity consumers.</p> <p>The scope for new technologies, such as batteries and smart inverter technologies, to address rapid frequency deviations through Fast Frequency Response (FFR) services, is being investigated in the COAG Energy Council's independent review into the future security of the National Electricity Market (Finkel Review), the final recommendations of which are expected to be released on 9 June 2017. Its preliminary report notes, for example, that a lithium -ion battery for example can provide a response within milliseconds of a significant frequency deviation - effectively emulating the effects of conventional inertia.</p> <p>It is not clear if FFR or some combination of FFR and inertia can already provide a lower cost means of addressing rapid declines in RoCoF compared to an IAS requirement on its own. Battery technologies in particular may be particularly cost effective, given the economies of scope associated with the services they can provide, which include regulation and contingency FCAS, storage in support of renewable intermittency and the equivalent of a peaking generation service.</p> <p>Without the opportunity to review the modelling and analysis that has underpinned PSC decision to implement the IAS it is difficult for Jacana Energy to appraise the validity of this approach with respect to these alternatives. We are concerned that if lower cost solutions are not explored, the overall costs of ancillary services borne by consumers will be higher than necessary.</p> <p>For these reasons we consider it is important that PSC perform a comprehensive cost benefit analysis of the IAS requirement that takes into account relevant recommendations of the Finkel Review.</p>	<p>The proposed alternatives for Inertia and Contingency FCAS provided by Jacana are a combination of inertia and “Fast Frequency Response” services. The FFR service identified in the Finkel Review are fundamentally the same as the Fast Raise/Lower Contingency FCAS specification in the Secure System Guidelines. With this understanding it is clear that the proposed alternative by Jacana (based on Finkel Review) is not substantially different to the proposed services in the Secure System Guidelines.</p> <p>As per the Finkel Review and AEMO’s International review of frequency control adaptation (by DGA consulting) both specify that a level of inertia is required for system security regardless of the FFR or Fast Raise/Lower Contingency FCAS. Thus, the approach taken by System Control regardless of cost/benefit analysis is the approach that must be taken to ensure system security. However, the levels of inertia to contingency FCAS are subject to periodic review/analysis and currently the amount of required inertia is not specified. The review will consider the capability of existing and proposed technology to provide the services and economic impacts of adjusting requirements.</p>

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<p>Jacana</p>	<p><b>Issue #30</b></p> <p>Jacana Energy notes that the IAS requirement can only be met by conventional fossil fuel generators. However, if as suggested above, batteries and/or solar PV inverter technologies can achieve the same system security objectives (albeit through different means), then an IAS requirement arguably creates a barrier to investment in emissions free technologies by excluding them from possible revenue opportunities.</p> <p>In this regard we note that under the part 3.5.3 of System Technical Code any changes PSC makes to the SSG must be consistent with government policy. Jacana Energy recommends that the Renewable Energy Expert Panel is consulted to ensure alignment of policy considerations.</p>	<p>Inertia Frequency Control Ancillary Service can be met by other technologies, not just “conventional fossil fuel generators”. As per the Secure System Guidelines:</p> <p>It is noted that Synchronous and Non-Synchronous (emulated) inertia sources have different operational performance. Synchronous Inertia is to be independently tested and the determined inertia provided to the Power System Controller for assessment. Emulated Inertia will be assessed on additional factors of operational performance including, but not limited to the following:</p> <ul style="list-style-type: none"> <li>• Measurement time</li> <li>• Signalling time</li> <li>• Activation time</li> <li>• Ramping time</li> </ul> <p>Based on the assessment of an emulated inertia or engineering technology, the technology may be accredited with an inertia contribution, an FCAS raise/lower contribution or another determination as deemed appropriate by the Power System Controller.</p> <p>The PSC believes that there is no discernible barrier to entry for a non-synchronous technology to provide equivalent inertia. The Secure System Guidelines has been written to outline the technical requirements in a manner that is technology neutral that will facilitate the introduction of new technologies for both generation and ancillary services.</p> <p>System Control is on the Renewable Energy Interagency Working Group and has consulted with the Renewable Energy Expert Panel.</p>



Stakeholder	Issue (Numbered)	System Control Response
Epuron	<p><b>Issue #31</b></p> <p>The Epuron Solar portfolio includes nearly 7 MW of operating solar photovoltaic assets distributed across the NT, including the 4.1 MW Uterne Power Plant at Alice Springs. We therefore appreciate the opportunity to submit feedback on the draft Secure System Guidelines (SSG).</p> <p>Epuron has a keen interest in NT electricity market developments, particularly those related to the transition from existing spinning reserve policies to new ancillary services (unbundling and FCAS) and which impact the implementation and operation of renewable energy projects.</p> <p>We make the general observation that the draft SSG do not specifically mention variable renewable energy generation and there is an important policy relationship between the themes raised in the SSG and the NT Government’s “Roadmap to Renewables” process (a 50% target). That is, the need to balance security concerns with the general policy goal of increasing the penetration of renewable energy.</p>	<p>System Control notes there is no specific mention of variable renewable energy generation. The Secure System Guidelines are drafted to be technology agnostic and set the technical requirements such that these may be met by any source.</p> <p>The PSC believes that the proposed Secure System Guidelines sets a framework that will not hinder increasing penetration of non-synchronous variable energy sources. Further work is currently being undertaken by the PSC that addresses the management of power system security and requirements of new non-synchronous generation and other technologies that may eventuate. However, these potential future requirements are not part of this secure system guidelines consultation.</p>
Epuron	<p><b>Issue #32</b></p> <p>A particular example of this relates to Alice Springs where our Uterne Power Plant operates, having been commissioned in 2011 and expanded in 2015. We note the reference in Section 7 to “Alice Springs System Security Dispatch Constraints”. We understand that this document sets out System Control’s current approach to maintenance of spinning reserve within the Alice Springs network. We also understand that this is short term advice which is periodically reviewed and will evolve over time. Epuron has an interest in maximising the output of the Uterne Power Plant (i.e., minimising PWC-directed curtailment events) and would appreciate the opportunity to be consulted as these reviews occur.</p>	<p>System Control notes this and will include the “Alice Springs System Security Dispatch Constraints” in the Secure System Guidelines. This may result in appropriate portions of the advice separated throughout relevant sections.</p> <p>Where possible, updates to this policy will be undertaken via industry consultation within the Secure System Guidelines. It may be updated as a short term advice with minimal initial consultation if there is an imminent power system security concern to be addressed. In this case, System Control will still provide any initial advice possible and consult with participants to achieve the best outcome.</p>