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Market Operator  
Power and Water Corporation  
By email: [market.operator@powerwater.com.au](mailto:market.operator@powerwater.com.au)

Dear Market Operator

**Re: Secure System Guidelines Consultation**

The attached Short Term Advice was issued to System Participants on Friday 28 April 2017. It makes changes to details that are included in the proposed Secure System Guidelines that is currently being consulted on. It is intended that this is considered by system participants in regards to the Sections 5 and 7 (Regional Application) of the proposed Secure System Guidelines. Relevant extracts of these sections follows:

From Section 5 Inertia Ancillary Service:

For a protected contingency event, there is a large demand/supply mismatch and the post-contingent inertia online is a determining factor for the Rate of Change of Frequency (RoCoF). Frequency control ancillary services are not intended to prevent loss of supply in such situations; the under frequency load shedding (UFLS) scheme is designed to operate to prevent a cascading failure leading to system black.

For protected contingency events a minimum amount of post contingent inertia is required to limit the initial RoCoF. This is required to ensure RoCoF is sufficiently low such that:

- Orderly UFLS or OFGS occurs and;
- RoCoF remains within the capabilities of the dispatched generation to prevent pole slipping (leading to cascading failure).

The current assessed allowable initial RoCoF is 4Hz/sec. This figure is preliminary only and further assessment is required, however in the interim it will be used to manage protected events until the RoCoF limits are accurately determined for each system.

The Power System controller may take actions to constrain additional inertia online where required or other constraints to minimise the contingency size to prevent system black from a protected contingency event.

From Section 7 Contingency Frequency Control Ancillary Service (FCAS) / Spinning Reserve:

**Regional Application**

**Darwin/Katherine**

Minimum Spinning Reserve:

25 MW of Spinning Reserve at all times.

15 MW of the Spinning Reserve requirement is to come from Frame 6 machines at all times.

This is to be dispatched on at least two Frame 6 machines.

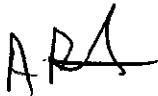
A node (i.e. [C4/5 Node], [C2/3 Node], [C1/7 Node]) can contribute a maximum of 7.5 MW of Frame 6 Spinning Reserve

Frame 6 Spinning Reserve must be provided by 2 or more nodes.

These changes are the result of recent system security risk analysis of a high consequence low probability event. The changes are expected to significantly mitigate the consequence of that risk. System Control proposes that this specification is included in the Darwin/Katherine Regional Application Sections for Inertia Ancillary Service (Section 5) and Spinning Reserve (Section 7) of the Secure System Guidelines.

If you have any questions please do not hesitate to contact Andrew Roberts, Operational Systems Manager, System Control (08) 892 46500.

Yours sincerely



Andrew Roberts  
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Power and Water Corporation

On behalf of

Malcolm Conway  
**General Manager System Control**  
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5 May 2017

## System Control Operational Document – Short Term Advice

### DK - Spinning Reserve & Dispatch of Frame Machines

Version 3

<b>From:</b>	Operations Planning
<b>To:</b>	Controllers
<b>Topic:</b>	Spinning Reserve & Dispatch of Frame Machines
<b>Start Date:</b>	02/05/2017 12:00:00 PM
<b>End Date:</b>	Until Further Notice
<b>Background:</b>	<ul style="list-style-type: none"> <li>- A single electrical/Node trip can lead to the loss of multiple machines leading to a higher rate of frequency change. A level of online inertia will slow this response.</li> <li>- SCTC requires 75% of load to be allocated to UFLS. UFLS should be sufficient to prevent system black for possible multiple generator contingencies.</li> </ul>

#### Spinning Reserve:

- A minimum of 25 MW of Spinning Reserve is to be dispatched at all times.
- A contribution to contingency response must be provided by a minimum of two Frame 6 machines:
  - The two Frame 6 machines must be on different nodes (i.e. [C4/C5 Node], [C2/C3 Node], [C1/C7 Node]).
  - The two Frame 6 machines must be loaded at 26 MW or below.\*
  - The two Frame 6 machines must not be otherwise restricted in their capacity or response.

#### Contingency Size Restrictions:

- To limit node contingency size, C4 and C5 when operating on combined cycle with C6 shall be dispatched at 26 MW or below. †
- For dispatch of C4/C5/C6 combined cycle, a minimum amount of post contingent inertia of 450MVAs‡ is required:

\* in the case of C4 and C5 current minimum stable load is 26, so the requirement is to be dispatched at 26 MW

† in the case of C4 and C5 current minimum stable load is 26, so the requirement is to be dispatched at 26 MW

‡ (MVA seconds) MVAs is a unit of inertia, it is not to be confused with MVA.

<b>Document Control</b>		
<b>TRIM No:</b> D2016/171200	<b>Document Type:</b> Short Term Advice	<b>View Access:</b> System Participants
<b>Document Owner:</b> Operations Planning		
This advice automatically expires at the end date unless it is extended by a System Control Manager. This Short Term Advice has been published in accordance with System Control Operational Documentation.		

## **System Control Procedures**

- To ensure sufficient UFLS provisions load on C4/C5/C6 is not to exceed 70% of System Load. Nominally, System Load shall be no less than 115 MW with C4/C5/C6 in combined cycle. ( $78\text{MW}/0.7 \approx 111\text{ MW}$ )
- If the above requirements cannot be met, one of C4 or C5 must be changed to open cycle and reduced to minimum stable load. It must then be the next unit offline. The other unit may remain on combined cycle with C6.

The requirements above are only in place while C4/C5/C6 operates in combined cycle.

## **General Information:**

- The contingency size restriction on C4/C5/C6 is to minimise the size of contingency and constrain inertia online such that orderly UFLS occurs and pole slipping does not occur.