

## **System Control Secure System Guidelines Consultation:**

### **Summary of Changes and Discussion Points**

This document highlight chapter by chapter:

- Summary of changes from Version 2.6 (2008) and current draft under consultation
- Discussion points or highlighted observations

#### 1. SCOPE

Changes:

- Minor modifications for clarity.

Discussion Points:

- N/A

#### 2. DEFINITIONS

Changes:

- Significant additions

Discussion Points:

- Some definitions expand upon from those in the SCTC (e.g. Spinning Reserve)

#### 3. DETERMINING BASE CAPACITY

Changes:

- Consideration for staged output (I.e. SPRINT)

Discussion Points:

- N/A

**Note: Previous Section 5 "Determining Peak Capacity has been removed. Peak Capacity is not used by System Control in system security analysis.**

#### 4. DETERMINING STANDBY RESERVE

Changes:

- Redefined LOS conditions in line with SCTC to match current practice.

Discussion Points:

- LOS conditions are used as criteria for maintenance planning in Section 17

#### 5. INERTIA ANCILLARY SERVICE

Changes:

- New section.

Discussion Points:

- New ancillary service. Requires a minimum amount of inertia to remain on-line following a single contingency and a minimum amount of inertia to remain online following a protected event.
- The IAS required for the Darwin/Katherine Power System is yet to be confirmed with a study (as with Alice/Tennant).
- Needed to ensure FCAS – regulation and contingency services work as designed and to assist with UFLS design for multiple or protected contingencies.
- Synchronous vs Non-synchronous inertia accreditation
- Implementation is tied with FCAS implementation
- System Inertia provision is tied with connection point and protected/credible contingency events.
- In December 2014 System Control initiated a significant change to the Darwin-Katherine Spinning Reserve policy
  - This included a requirement for a minimum number of specific machines with relatively high inertia to be online at all times.
  - During 2014, prior to the change, Darwin Katherine had experienced 18 single contingency under frequency load sheds, an average of 21 days between events
  - In over two years since the change, Darwin-Katherine has experienced one single contingency under frequency load shed
- The cost of providing ancillary services is currently 'bundled' into the wholesale energy price. The electricity reform process being undertaken by DTF includes the unbundling of the cost of providing ancillary services.

## 6. DETERMINING ADEQUATE REGULATING RESERVE

Changes:

- Dynamic Regulating Reserve is new.
- Classification is distinguished from Spinning Reserve
- Region specific requirements impacted by start time of generation.

Discussion Points:

- Higher regulating reserve in morning/evening ramp off
- Regulating reserve to cater for weather events (significant rainfall & corresponding load drop off)
- The proposed changes to regulating reserves are an increase in requirements. However, the existing requirements are seen to be inadequate.
- For Darwin Katherine the current Spinning Reserve policy (for contingency events) results in the proposed Regulating Reserve requirements to be met for the vast majority of time.
- One of the benefits of specifying appropriate levels of regulating reserve is to assist with the unbundling of ancillary services as part of the DTF industry reforms.

## 7. CONTINGENCY FREQUENCY CONTROL ANCILLARY SERVICE (FCAS)/SPINNING RESERVE

Changes:

- New section.

Discussion Points:

- FCAS implementation date to be confirmed for the Darwin/Katherine Power System. Work still required assessing FCAS provisions and inertia requirements. Once the date and detail have been finalised a short consultation for the secure system guidelines will be undertaken.
- Implementation for Alice/Tennant is yet to be confirmed with a study.
- Spinning Reserve changed to reflect the interim changes made since 2008 SSG document.
- The current modelling of the proposed contingency FCAS arrangements for Darwin Katherine are indicating that there will not be significant changes to the dispatch of generators currently providing the services. Rather there will be subtle re assignment of where the reserves are dynamically allocated. The benefit is expected to mean that there will be less under frequency load shed events than at present.

8. DETERMINING ADEQUATE VOLTAGE LEVELS FOR THE SYSTEM

Changes:

- 33kV removed from table of typical voltage set points as 33kV is not currently used.

Discussion Points:

- Power Networks have implemented a change to the 11kV nominal set point, moving it from 11.1 to 10.7 kV in the Darwin-Katherine system.

9. DETERMINING ADEQUATE REACTIVE POWER RESERVE FOR THE SYSTEM

Changes:

- Measures of adequate reactive power outlined

Discussion Points:

- N/A

10. DETERMINING ADEQUATE FREQUENCY LEVELS

Changes:

- Terms and definitions are clarified and co-ordinated with NTC and SCTC requirements

Discussion Points:

- N/A

11. DETERMINING ADEQUATE ENERGY FOR THE SYSTEM

Changes:

- Inclusion of Preliminary Alert Level: 18 hours.
- Both quality and quantity of fuel to trigger alerts

Discussion Points:

- N/A

12. DETERMINING CAPACITY OF TRANSMISSION FACILITIES

Changes:

- Standardised terms used to define ratings
- Outlined responsibilities of Network Operator to provide Ratings

Discussion Points:

- N/A

13. DETERMINING FAULT LEVEL REQUIREMENTS

Changes:

- Network Operators Responsibilities in assessing fault level risks
- System Control to work with Network Operator to manage risks associated with fault levels
- Consideration for both high and low fault levels.

Discussion Points:

- Network Operator/Power System Controller action plans for high/low fault level risks.

14. SYSTEM STABILITY

Changes:

- Removed NTC requirements – Referred to NTC for these
- Used applicable AEMO stability definitions
- Actions taken by PSC in response to instabilities

Discussion Points:

- N/A

15. ADOPTION OF RELIABILITY CRITERIA FOR NETWORKS

Changes:

- Included classification of “protected events” – Too expensive or impractical to manage such that there is no impact to customers.
- Generalised the classification of contingency types – Less specific

Discussion Points:

- Reliability criteria cover operational reliability standards – This does not dictate planning and design requirements.

16. POWER SYSTEM OUTAGE PLANNING

Changes:

- Reflects current practice
- Operate to credible N-1
- Ensure LORR or LOS levels are acceptable

Discussion Points:

- N/A

17. DETERMINING ADEQUATE PROTECTION INTEGRITY

Changes:

- Planning for protection outages

Discussion Points:

- N/A

18. GENERATOR AND LOAD REGISTRATION THRESHOLDS

Changes:

- New section load and generator sizes that can impact on system security and that System Control need to be notified of intention to connect.

Discussion Points:

- Possible requirements on new connections
- Actions the PSC may take
- SC to work with PN to establish SC registration process
- "The Power System Controller must be aware of any material step change in load or change in output of embedded generation to ensure supply to all customers is within the technical envelope and appropriate generation dispatched."

19. SPECIAL CONTROL AND PROTECTION SCHEMES

Changes:

- New section that identifies control and protection schemes that System Control has oversight of.

Discussion Points:

- N/A

20. BLACK START AND SYSTEM BLACK RESTART PROCEDURES

Changes:

- New section that outlines principles in black system restart

Discussion Points:

- N/A

21. REFERENCES

Changes:

- Supporting documentation for various sections included

Discussion Points:

- N/A

22. DOCUMENT HISTORY

Changes:

- Cleared version history starting at Version 3 – Convention will be to use whole numbers

Discussion Points:

- N/A