

APPENDIX C. OVERVIEW LIST OF CODE CHANGES

C.1 Network Technical Code (NTC) amendments

Table 1 – Amendments to NTC (draft as at 29/8/19)

NTC Clause	Description of proposed amendment
Part A	Legislative requirements Changes reflect amendments from 1 July 2019 to the governing Act and Regulations. The powers to amend NTC now reside in the Electricity Reform (Administration) Regulations. Figure 1 has been updated.
1.4	Provides for commencement of a new version of the NTC
1.7.3(a)(1)	Obligations of Generator Users: Editorial – reference to clause 3.2 deleted.
1.9	Code amendments - Paragraph (c) is made subject to paragraph (f). A new paragraph (d) allows for an extension of the 30 days to allow for required consultation
2.2.2	Update to refer to spinning reserve 'or C-FCAS as applicable in each regulated power system'
2.6.1	Transient rotor angle stability: Transferred to clause 3.3.5.5
3.2 opening paragraph	Section 3 - Technical requirements for equipment connected to the network In 3.2 – new introductory paragraph added to modify this clause to apply to network users other than Generator Users so that the GPS are all contained under clause 3.3.
3.3 (modified)	New requirements for connection of Generators Provisions replaced by those based on NER Schedule 5.2 'Conditions for connections of generators'. Opening paragraphs (a) to (f) replaced by a single summary paragraph.
3.3.1 (modified)	Outline of Requirements: Existing opening paragraphs (a) to (e) and sub-clause 3.3.1.1 on 'Protection requirements' replaced by the material provisions in NER S5.2.1. Paragraph (b) clarifies materiality thresholds where clause 3.3 applies.
3.3.2 (modified)	Application of settings: Existing opening paragraphs (a) to (e) and sub-clauses 3.3.2.1 to 3.3.2.11 on 'Technical characteristics' replaced by the material provisions in NER S5.2.2.
3.3.3 (modified)	Technical matters to be co-ordinated: Existing sub-clauses 3.3.3.1 to 3.3.3.6 on 'Monitoring and control requirements' replaced by the material provisions in NER clause S5.2.3.
3.3.4 (new)	Provision of information: Existing clause 11.3 'Information to be provided by Users with Generators' transferred to this location with suitable editorial adjustments to align with NER clause S5.2.4.
3.3.5 (new)	Technical requirements: Incorporate the provisions of NER clauses S5.2.5 & 5.3.4A (b1) & (b2) as new opening paragraphs. The majority of this clause provides clarity around the principles for proposing negotiating access standards for generators.
3.3.5.1	Reactive Power Capability: Incorporate the provisions of NER clause S5.2.5.1. automatic access standard.

NTC Clause	Description of proposed amendment
3.3.5.2	Quality of Electricity Generated: Incorporate the provisions of NER clause S5.2.5.2 automatic access standard with suitable amendments for the NT.
3.3.5.3	Generating Unit Response to Frequency Disturbance: Incorporate the provisions of NER clause S5.2.5.3 automatic access standard with suitable amendments for the NT.
3.3.5.4	Generating System Response to Voltage Disturbances: Incorporate the provisions of NER clause S5.2.5.4 automatic access standard with suitable amendments for the NT.
3.3.5.5	Generating System Response to Disturbances Following Contingency Events: Incorporate the provisions of NER clause S5.2.5.5 automatic access standard with suitable amendments for the NT.
3.3.5.6	Quality of Electricity Generated and Continuous Uninterrupted Operation: Incorporate the provisions of NER clause S5.2.5.6 automatic access standard with suitable amendments for the NT.
3.3.5.7	Partial Load Rejection: Incorporate the provisions of NER clause S5.2.5.7 automatic access standard with suitable amendments for the NT.
3.3.5.8	Protection of Generating Units from Power System Disturbances: Incorporate the provisions of NER clause S5.2.5.8 automatic access standard with suitable amendments for the NT.
3.3.5.9	Protection Systems that Impact on Power System Security: Incorporate the provisions of NER clause S5.2.5.9 automatic access standard.
3.3.5.10	Protection to Trip Plant for Unstable Operation: Incorporate the provisions of NER clause S5.2.5.10 automatic access standard.
3.3.5.11	Frequency Control: Incorporate the provisions of NER clause S5.2.5.11 automatic access standard with suitable amendments for the NT.
3.3.5.12	Impact on Network Capability: Incorporate the provisions of NER clause S5.2.5.12 automatic access standard.
3.3.5.13	Voltage and Reactive Power Control: Incorporate the provisions from NTC V3.1 clauses 3.3.3.5 & 3.3.3.6.
3.3.5.14	Active Power Control: Incorporate the provisions of NER clause S5.2.5.14 automatic access standard with suitable amendments for the NT.
3.3.5.15 (new)	Inertia and fast contingency FCAS: New clause requiring generator users to demonstrate the capability to provide a minimum level of inertia or contingency FCAS or a combination of both. Note the NTC only defines technical capability a generator needs to meet for connection and does not prescribe how generators are operated to meet power system security requirements.
3.3.5.16 (new)	System Strength: New clause to incorporate the provisions of NER clause 5.3.4B to ensure new generators are able to meet the agreed GPS and not adversely affect other Network Users.

NTC Clause	Description of proposed amendment
3.3.5.17 (new)	Capacity Forecasting: New clause requiring generator users to demonstrate the capability to provide capacity forecasts 30 minutes ahead to enable optimal economic dispatch of generators.
3.3.6 (new)	Monitoring and Control Requirements: Parent clause heading only
3.3.6.1	Remote Monitoring and Control: Incorporate the provisions from NTC V 3.1 clauses 3.3.3.1 & 3.3.3.2.
3.3.6.2	Communications Equipment: Incorporate the provisions from NTC V3.1 clause 3.3.3.3.
3.3.7	Power Station Auxiliary Supplies: Incorporate the provisions of NER clause S5.2.7.
3.3.8	Fault Current: Incorporate the provisions of NER clause S5.2.8 automatic access standard.
4	Power System Operational Support: Change in title from 'Power System Security' to remove clash with this title in the SCTC, to reflect Network Operator obligations in supporting the Power System Controller to manage power system security.
4.1	Introduction: Delete clause.
4.1.1	Purpose and application of clause 4: Delete clause.
4.2	Power system security principles: Delete clause.
4.2.1	Power system operating state: Delete clause.
4.2.2	Technical envelope: Delete clause.
4.2.3	General principles for maintaining power system security: Delete clause.
4.3	Power system security obligations and responsibilities: Deleted parent heading clause to reflect reduced content.
4.3.1	Time for undertaking action: Delete clause – covered in SCTC.
4.3.2	Network Operator: Retain paragraphs (a) to (d). Modify paragraphs (f) & (g) to refer to consultation with the Power System Controller.
4.3.3	Power System Controller: Delete clause – covered in SCTC.
4.3.4	Users: retained, but heading modified
4.4	Power system frequency control: Deleted parent heading clause to reflect reduced content.
4.4.1	Power system frequency control responsibilities: Delete clause – covered in SCTC.
4.4.2	Operational frequency control requirements: Delete clause – covered in SCTC.
4.5	Voltage control: Heading modified to reflect reduced content.

NTC Clause	Description of proposed amendment
4.5.1	Network voltage control: new paragraph (e) added to ensure that the limits in paragraph (c) are recorded in the SSG.
4.5.2	Reactive power reserve requirements: Delete clause – covered in SCTC and SSG.
4.6	Power system operating procedures: Deleted parent heading clause to reflect reduced content.
4.6.1	Network operations: Delete paragraph (a). Retain paragraphs (b) & (c) in NTC.
4.6.2	Switching of reactive power facilities: Delete paragraph (a). Retain paragraph (b) in NTC with suitable editorial amendments.
4.6.3	Generation limits: Deleted – superfluous as equipment ratings advised to the Power System Controller are not exceeded as a fundamental principle.
4.7	Power system security operations – Heading deleted as no longer reflects reduced content, new heading may be added.
4.7.1	Users’ advice: Delete clause – covered in SCTC.
4.7.2	Protection or control system abnormality: Delete clause. Transfer provision to new SCTC clause 6.7.4
4.7.3	Power System Controller advice on power system emergency conditions: Delete clause. Transfer paragraph (a) to new SCTC paragraph 7.5(b) with suitable modifications. Transfer paragraph (b) to System Control Incident Reporting Guideline.
4.7.4	Managing a power system contingency event: Delete clause –covered in SCTC.
4.7.5	Managing electricity supply shortfall events: Delete paragraphs (a)(1), (2) & (3), and (c). Retain paragraphs (a)(3) and (b) with editorial to change ‘notice’ to ‘direction’.
4.7.6	Directions by the Power System Controller affecting power system security: Retain paragraphs (a) & (b) with suitable modifications to focus on un-licensed Users.
4.7.7	Disconnection of Generation Units and/or associated loads: Modified paragraph (a)
4.7.8	Emergency black start-up facilities: Retain provision on NTC.
4.7.9	Black system procedures: Delete clause –covered in SCTC.
4.7.10	Black system start-up: Delete paragraphs (a), (c), (d) & (e). Retain paragraph (b) in NTC.
4.7.11	Review of operating incidents: Delete clause – covered in SCTC.
4.8	Power system security support: Heading deleted as no longer reflects reduced content, new heading may be added
4.8.1	Remote control and monitoring devices: Deleted – covered under proposed NTC 3.3.6 and sub clauses.
4.8.2	Operational control and indication communication facilities: Deleted – covered under proposed NTC 3.3.6 and sub clauses.

NTC Clause	Description of proposed amendment
4.8.3	Power system voice/data operational communication facilities: Delete clause –covered in SCTC.
4.8.4	Records of power system operational communication: Delete clause –covered in SCTC.
4.9	Nomenclature standards: Replace provision with a single paragraph to cross-reference SCTC. Transfer all paragraphs to the SCTC clause 6.14.
9.1.2	Commitment of Generation Units: Delete clause. Provision no longer relevant to the SCTC or the NTC.
9.1.3	De-commitment, or output reduction, by Users requiring standby power: Delete clause. SCTC suitably modified to accommodate this provision.
9.4	Generating limits: Deleted – superfluous as equipment ratings advised to the Power System Controller are not exceeded as a fundamental principle.
10	Metering requirements: Deleted - superseded by Chapter 7A of the NT NER from 1 July 2019.
11.3	Information to be provided by Users with Generators: Transferred to clause 3.3.4
12	Transitional arrangements and derogations from the Code: Heading changed
12.1	Purpose and application: updated paragraph (d) to reflect change in laws. New paragraphs (d) to (g) establish a process for derogations from the Code.
12.2	Pre 1 April 2019 plant and equipment: New provisions to allow for grandfathering.
12.3	Post 1 April 2019 plant and equipment: New provisions for Generator Users who have entered into a connection agreement with the Network Operator prior to Version 4 of this Code coming into effect but has not completed the connection of plant and equipment to the electricity network prior to 1 April 2019. A new Schedule S4 establishes grace periods for specified technical components.
13.2	Amendments to Planning Criteria: Paragraph (c) is made subject to paragraph (f). New (d) allows extension of the 30 day period to allow for required consultation.
13.9	Investment analysis and reporting: In paragraph (d)(4), changed to refer to spinning reserve 'or C-FCAS as applicable in each regulated power system'.
16.3(b) & (e)	Frequency stability criteria: Added RoCoF (rate of change of frequency) regional objectives. New clauses (b) added, (d) changed to refer to spinning reserve 'or C-FCAS as applicable in each regulated power system'.
19.4	Noise: Updated reference to relevant statute.
Attachment 1 Glossary	Various terms used have been standardised across the codes, with definitions aligned with the NT NER where appropriate.

NTC Clause	Description of proposed amendment
Attachment 6	Access Application schedule: Deleted, to reflect repeal of third party access legislation and code.
Schedule S4	A new Schedule S4 establishes grace periods for the purposes of clause 12.3

C.2 System Control Technical Code (SCTC) amendments

Table 1 – Amendments to SCTC (draft as at 3/9/19)

Clause	Description of proposed amendment
1.1 opening paragraph	Authorisation: Editorial. Delete term 'Technical', and in all other similar references throughout the Code.
1.3(f)	Application: Editorial. Rework to clarify intent and improve understanding.
1.4(d)	Interpretation: Editorial. Change 'Ring Fencing Code' to italics font. Define in the Glossary.
1.7.4	Obligations of the Power System Controller: Editorial. Modify the presentation of paragraph (a) to align its intent with clause 38 of the <i>Electricity Reform Act</i> ; new text introduction in (a)(2); updated reference to Acts and Regulations in (b)
3.2.3(b)	Further classification of generating units: Restructured to make the categories (i.e. scheduled, semi-scheduled and non-scheduled) and basis for their classification clearer.
3.3.1(s)	Directions or instructions: Clarifies that the Network Operator is to have contractual arrangements in place to allow directions or instructions from the Power System Controller to be acted on by un-licensed Network Users, and vice-versa, in accordance with the mechanism in clause 3.3.3
3.3.3	Responsibilities of the Network Operator: Clarifies the responsibilities of the Network Operator in maintaining power system security.
3.11	Forecasts: Heading changed to delete word 'load' to clarify requirements for 7 day and 30 day ahead forecasts. Clause 3.11.1(a) amends format for generation capability for active power.
4.3(a)	Dispatch Principles: A new paragraph (7) provides that where possible, in normal operation, scheduling ancillary services from generating systems operated by Generators (other than Territory Generation) that pay for ancillary services under A6.11 should result in an equivalent or increased dispatch level (for the Darwin-Katherine power system).
6.5.1	Types of outages: Clause restructured for clarity, and new 'performance issue outage' added in paragraph (d).
6.6	Forced Outages: Title and opening paragraph changed to reflect changes to clause 6.5.1.

Clause	Description of proposed amendment
6.7.4	Protocols for protection or control system abnormality: NTC revision. New clause added to enable the intent of current NTC clause 4.7.2 'Protection or control system abnormality' to remain unchanged in the SCTC.
6.14	Plant numbering, nomenclature and Drawings: NTC revision. The wording from the definition of 'nomenclature' has been added clause 6.14 as the opening paragraph. The principles, in paragraphs (a) to (j), have been extracted from NTC clause 4.9 'Nomenclature standards'. The NTC clause 4.9 has been removed from the NTC. The definition has been streamlined. A new paragraph (l) has been added for generators granted a relevant derogation under clause 12.1 of the Network Technical Code
6.21.4	Statutory reference in paragraph (d) has been updated
7.3.4	Incident reporting guideline: Changes to make guideline development mandatory, not discretionary.
7.5(b)	Public reporting: New paragraph (b) stipulates content for the Incident Reporting Guideline.
Glossary	Various terms used have been standardised across the codes, with definitions aligned with the NT NER where appropriate