CHAPTER 4

4. Power System Security

4.1 Introduction

4.1.1 Purpose

(a) This Chapter:

(1) provides the framework for achieving and maintaining a secure *power system*;

(2) provides the conditions under which *NEMMCO* can intervene in the processes of the *spot market* and issue *directions* to *Registered Participants* so as to maintain or re-establish a secure and reliable *power system*;

(3) has the following aims:

(i) to detail the principles and guidelines for achieving and maintaining *power system security*;

(ii) to establish the processes for the assessment of the adequacy of *power system* reserves;

(iii) to establish processes to enable *NEMMCO* to plan and conduct operations within the *power system* to achieve and maintain *power system security*; and

(iv) to establish processes for the actual *dispatch* of *scheduled generating units*, *scheduled loads*, *scheduled network services* and *ancillary services* by *NEMMCO*.

(b) By virtue of this Chapter and the *National Electricity Law*, *NEMMCO* has responsibility to maintain and improve *power system security*. This Chapter also requires the *Jurisdictional System Security Coordinator* for each *participating jurisdiction* to advise *NEMMCO* of the requirements of the *participating jurisdiction* regarding *sensitive loads* and priority of *load shedding* and requires *NEMMCO* to provide copies of the relevant *load shedding procedures* to the *Jurisdictional System Security Coordinator*.

4.1.2 [Deleted]

4.2 Definitions and Principles

This clause sets out certain definitions and concepts that are relevant to this Chapter.

4.2.1 [Deleted]

4.2.2 Satisfactory Operating State

The *power system* is defined as being in a *satisfactory operating state* when:

(a) the *frequency* at all energised *busbars* of the *power system* is within the *normal operating frequency band*, except for brief excursions outside the *normal operating frequency band* but within the *normal operating frequency excursion band*;

(b) the *voltage* magnitudes at all energised *busbars* at any *switchyard* or *substation* of the *power system* are within the relevant limits set by the relevant *Network Service Providers* in accordance with clause S5.1.4 of schedule 5.1;

(c) the current flows on all *transmission lines* of the *power system* are within the ratings (accounting for time dependency in the case of emergency ratings) as defined by the relevant *Network Service Providers* in accordance with schedule 5.1;

(d) all other *plant* forming part of or impacting on the *power system* is being operated within the relevant operating ratings (accounting for time dependency in the case of emergency ratings) as defined by the relevant *Network Service Providers* in accordance with schedule 5.1;

(e) the configuration of the *power system* is such that the severity of any potential fault is within the capability of circuit breakers to *disconnect* the faulted circuit or equipment; and

(f) the conditions of the *power system* are stable in accordance with requirements designated in or under clause S5.1.8 of schedule 5.1.

4.2.3 Credible and non-credible contingency events

(a) A "*contingency event*" means an event affecting the *power system* which *NEMMCO* expects would be likely to involve the failure or removal from operational service of a *generating unit* or *transmission element*.

(b) A "*credible contingency event*" means a *contingency event* the occurrence of which *NEMMCO* considers to be reasonably possible in the surrounding circumstances including the *technical envelope*. Without limitation, examples of *credible contingency events* are likely to include:

(1) the unexpected automatic or manual *disconnection* of, or the unplanned reduction in capacity of, one operating *generating unit*; or

(2) the unexpected *disconnection* of one major item of *transmission plant* (e.g. *transmission line*, *transformer* or *reactive plant*) other than as a result of a three phase electrical fault anywhere on the *power system*.

(c) A "*single credible contingency event*" means an individual *credible contingency event* for which a *Registered Participant* adversely affected by the event would reasonably expect, under normal conditions, the design or operation of the relevant part of the *power system* would adequately cater, so as to avoid significant disruption to *power system security*.

(d) The "*critical single credible contingency event*" at any particular time is the *single credible contingency event* considered by *NEMMCO*, in the particular circumstances, to have the potential for the most significant impact on the *power system* at that time. This would generally be the instantaneous loss of the largest *generating unit* on the *power system*. Alternatively, it might be the loss of any *interconnection* under *abnormal conditions*.

(e) A "*non-credible contingency event*" is a *contingency event* other than a *credible contingency event*. Without limitation, examples of *non-credible contingency events* are likely to include:

(1) three phase electrical faults on the *power system*; or

(2) simultaneous disruptive events such as:

(i) multiple *generating unit* failures; or

(ii) double circuit *transmission line* failure (such as may be caused by tower collapse).

(f) *Abnormal conditions* are conditions posing added risks to the *power system* including, without limitation, severe weather conditions, lightning, storms, and bush fires. During such conditions, *NEMMCO* may, in its reasonable opinion, determine a *non-credible contingency event* (in particular, but without limitation, the tripping of some *substation* or *switchyard busbars* or both circuits of a double circuit *transmission line*) to be a *credible contingency event*. *NEMMCO* must notify all *Market Participants* of such a re-classification as soon as practicable.

4.2.4 Secure operating state and power system security

(a) The *power system* is defined to be in a *secure operating state* if, in *NEMMCO*'s reasonable opinion, taking into consideration the appropriate *power system security* principles described in clause 4.2.6:

(1) the *power system* is in a *satisfactory operating state*; and

(2) the *power system* will return to a *satisfactory operating state* following the occurrence of a *single credible contingency event* in accordance with the *power system security and reliability standards*.

(b) Without limitation, in forming the opinions described in clause 4.2.4(a), *NEMMCO* must:

(1) consider the impact of each of the potentially *constrained interconnectors*; and

(2) use the *technical envelope* as the basis of determining events considered to be *credible contingency events* at that time.

4.2.5 Technical envelope

(a) The *technical envelope* means the technical boundary limits of the *power system* for achieving and maintaining the *secure operating state* of the *power system* for a given demand and *power system* scenario.

(b) *NEMMCO* must determine and revise the *technical envelope* (as may be necessary from time to time) by taking into account the prevailing *power system* and *plant* conditions as described in clause 4.2.5(c).

(c) In determining and revising the *technical envelope NEMMCO* must take into account matters such as:

(1) *NEMMCO's* forecast of total *power system load*;

(2) the provision of the applicable *contingency capacity reserves*;

(3) operation within all *plant* capabilities of *plant* on the *power system*;

(4) *contingency capacity reserves* available to handle a *single credible contingency event*;

(5) advised *generation* minimum *load constraints*;

(6) *constraints* on *transmission networks*, including short term limitations;

(7) *ancillary service* requirements;

(8) **[Deleted]**

(9) the existence of proposals for any major equipment or *plant* testing, including the checking of, or possible changes in, *transmission plant* availability; and

(10) applicable *performance standards*.

(d) *NEMMCO* must, when determining the secure operating limits of the *power system*, assume that the applicable *performance standards* are being met, subject to:

(1) a *Registered Participant* notifying *NEMMCO*, in accordance with clause 4.15(f), that a *performance standard* is not being met; or

(2) *NEMMCO* otherwise becoming aware that a *performance standard* is not being met.

4.2.6 General principles for maintaining power system security

The *power system security* principles are as follows:

(a) To the extent practicable, the *power system* should be operated such that it is and will remain in a *secure operating state*.

(b) Following a *contingency event* (whether or not a *credible contingency event*) or a significant change in *power system* conditions, *NEMMCO* should take all reasonable actions:

(1) to adjust, wherever possible, the operating conditions with a view to returning the *power system* to a *secure operating state* as soon as it is practical to do so, and, in any event, within thirty minutes; or

(2) if any principles and guidelines have been *published* under clause 8.8.1(a)(2a), to adjust, wherever possible, the operating conditions, in accordance with such principles and guidelines, with a view to returning the *power system* to a *secure operating state* within at most thirty minutes.

(c) Adequate *load shedding* facilities initiated automatically by *frequency* conditions outside the *normal operating frequency excursion band* should be available and in service to restore the *power system* to a *satisfactory operating state* following significant multiple *contingency events*.

(d) **[Deleted]**

(e) Sufficient *black start-up facilities* should be available so as to allow the restoration of *power system security* and any necessary restarting of *generating units* following a *black system* condition.

4.2.7 Reliable Operating State

The *power system* is assessed to be in a *reliable operating state* when:

(a) *NEMMCO* has not *disconnected*, and does not expect to *disconnect*, any points of *load connection* under clause 4.8.9;

(b) no *load shedding* is occurring or expected to occur anywhere on the *power system* under clause 4.8.9; and

(c) in *NEMMCO's* reasonable opinion the levels of *short term* and *medium term capacity reserves* available to the *power system* are at least equal to the required levels determined in accordance with the *power system security and reliability standards*.

4.2.8 Time for undertaking action

The provisions of clause 1.7.1(l) do not apply to this Chapter and an event which is required under this Chapter to occur on or by a stipulated *day* must occur on or by that *day* whether or not a *business day*.

4.3 Power System Security Responsibilities and Obligations

4.3.1 Responsibility of NEMMCO for power system security

The *NEMMCO power system security responsibilities* are:

(a) to maintain *power system security*;

(b) to monitor the operating status of the *power system*;

(c) to co-ordinate the *System Operators* in undertaking certain of its activities and operations and monitoring activities of the *power system*;

(d) to ensure that *high voltage* switching procedures and arrangements are utilised by *Network Service Providers* to provide adequate protection of the *power system*;

(e) to assess potential infringement of the *technical envelope* or *power system operating procedures* which could affect the security of the *power system*;

(f) to ensure that the *power system* is operated within the limits of the *technical envelope*;

(g) to ensure that all *plant* and equipment under its control or co-ordination is operated within the appropriate operational or emergency limits which are advised to *NEMMCO* by the respective *Network Service Providers* or *Registered Participants*;

(h) to assess the impacts of technical and any operational *plant* on the operation of the *power system*;

(i) to arrange the *dispatch* of *scheduled generating units*, *scheduled loads*, *scheduled network services* and *ancillary services* (including *dispatch* by remote control actions or specific directions) in accordance with the *Rules*, allowing for the dynamic nature of the *technical envelope*;

(j) to determine any potential *constraint* on the *dispatch* of *generating units*, *loads*, *market network services* and *ancillary services* and to assess the effect of this *constraint* on the maintenance of *power system security*;

(k) to assess the availability and adequacy, including the dynamic response, of *contingency capacity reserves* and *reactive power reserves* in accordance with the *power system security and reliability standards* and to ensure that appropriate levels of *contingency capacity reserves* and *reactive power reserves* are available:

(1) to ensure the *power system* is, and is maintained, in a *satisfactory operating state*; and

(2) to arrest the impacts of a range of significant multiple *contingency events* (affecting up to 60% of the total *power system load*) to allow a prompt restoration or recovery of *power system security*, taking into account under-*frequency* initiated *load shedding* capability provided under *connection agreements* or otherwise;

(l) to determine the required levels of *short term capacity reserves* and *medium term capacity reserves* in accordance with the *power system security and reliability standards*, and to assess the availability of the actual *short term capacity reserve* and actual *medium term capacity reserve* in accordance with the *projected assessment of system adequacy* (PASA), described in Chapter 3, which would be available to supplement utilised *contingency capacity reserves* and, if necessary, initiate action in relation to the trading in *reserves* in accordance with Chapter 3;

(m) to make available to *Registered Participants* as appropriate, information about the potential for, or the occurrence of, a situation which could significantly impact, or is significantly impacting, on *power system security*, and advise of any *low reserve* condition for the relevant periods where the *short term capacity reserve* and/or *medium term capacity reserve* is assessed as being less than that determined in accordance with the *short term capacity reserve standard* or *medium term capacity reserve standard* respectively;

(n) to refer to *Registered Participants*, as *NEMMCO* deems appropriate, information of which *NEMMCO* becomes aware in relation to significant risks to the *power system* where actions to achieve a resolution of those risks are outside the responsibility or control of *NEMMCO*;

(o) to utilise resources and services provided or procured as *ancillary services* or otherwise to maintain or restore the *satisfactory operating state* of the *power system*;

(p) to procure adequate *system restart ancillary services* in accordance with clause 3.11 to enable *NEMMCO* to co-ordinate the response to a partial or total *black system* condition;

(q) to interrupt, subject to clause 4.3.2(l), *Registered Participant connections* as necessary during emergency situations to facilitate the re-establishment of the *satisfactory operating state* of the *power system*;

(r) to issue a *direction* or *clause 4.8.9 instruction* (as necessary) to any *Registered Participant*;

(s) to co-ordinate and direct any rotation of widespread interruption of demand in the event of a major *supply* shortfall or disruption;

(t) to liaise with *participating jurisdictions* should there be a need to manage an extensive disruption, including the use of emergency services powers in a *participating jurisdiction*;

(u) to determine the extent to which the levels of *contingency capacity reserves* and *reactive power reserves* are or were appropriate through appropriate testing, auditing and simulation studies;

(v) to investigate and review all major *power system* operational incidents and to initiate action plans to manage any abnormal situations or significant deficiencies which could reasonably threaten *power system security*. Such situations or deficiencies include without limitation:

(1) *power system frequencies* outside those specified in the definition of *satisfactory operating state*;

(2) *power system voltages* outside those specified in the definition of *satisfactory operating state*;

(3) actual or potential *power system* instability; and

(4) unplanned/unexpected operation of major *power system* equipment; and

(w) to ensure that each *System Operator* satisfactorily interacts with *NEMMCO*, other *System Operators* and *Distribution System Operators* for both *transmission* and *distribution network* activities and operations, so that *power system security* is not jeopardised by operations on the *connected transmission networks* and *distribution networks*.

4.3.2 System security

(a) *NEMMCO* must use its reasonable endeavours, as permitted under the *Rules*, including through the provision of appropriate information to *Registered Participants* to the extent permitted by law and under the *Rules*, to achieve the *NEMMCO power system security responsibilities* in accordance with the *power system security* principles described in clause 4.2.6.

(b) Where an obligation is imposed on *NEMMCO* under this Chapter to arrange or control any act, matter or thing or to ensure that any other person undertakes or refrains from any act, that obligation is limited to a requirement for *NEMMCO* to use reasonable endeavours as permitted under the *Rules*, including to give such directions as are within its powers, to comply with that obligation.

(c) If *NEMMCO* fails to arrange or control any act, matter or thing or the acts of any other person notwithstanding the use of *NEMMCO's* reasonable endeavours, *NEMMCO* will not be taken to have breached such obligation.

(d) *NEMMCO* must make accessible to *Registered Participants* such information as:

(1) *NEMMCO* considers appropriate;

(2) *NEMMCO* is permitted to disclose in order to assist *Registered Participants* to make appropriate *market* decisions; and

(3) *NEMMCO* is able to disclose to enable *Registered Participants* to consider initiating procedures to manage the potential risk of any necessary action by *NEMMCO* to restore or maintain *power system security*,

provided that, in doing so, *NEMMCO* must use reasonable endeavours to ensure that such information is available to those *Registered Participants* who request the information on equivalent bases.

(e) The *Jurisdictional System Security Coordinator* for a *participating jurisdiction* may nominate an individual to be the principal point of contact with *NEMMCO* for the *Jurisdictional System Security Coordinator*.

(f) The *Jurisdictional System Security Coordinator* for each *participating jurisdiction* must provide NEMMCO with:

(1) a schedule of *sensitive loads* in that jurisdiction, specifying:

(i) the priority, in terms of security of *supply*, that each *load* specified in the schedule has over the other *loads* specified in the schedule; and

(ii) the *loads* (if any) for which the approval of the *Jurisdictional System Security Coordinator* must be obtained by *NEMMCO* under clause 4.3.2(l) before *NEMMCO* can interrupt *supply* to, or prevent reconnection of, that *load*: and

(2) a schedule setting out the order in which *loads* in the *participating jurisdiction*, other than *sensitive loads*, may be shed by *NEMMCO* for the purposes of undertaking any *load shedding* under clause 4.8.

(g) A *Jurisdictional System Security Coordinator* may from time to time amend the schedules provided to *NEMMCO* under clause 4.3.2(f) and must provide to *NEMMCO* a copy of the amended schedules.

(h) *NEMMCO* must develop, update and maintain a set of procedures for each *participating jurisdiction* under which *loads* will be shed and restored in accordance with the priorities set out in the schedules for that *participating jurisdiction* (which procedures for a *participating jurisdiction* shall be known as the "*load shedding procedures*" for that jurisdiction).

(i) *NEMMCO* must provide the *Jurisdictional System Security Coordinator* for a *participating jurisdiction* with a copy of the *load shedding procedures* for that *participating jurisdiction*, as amended from time to time.

(j) The *load shedding procedures* for a *participating jurisdiction* must be consistent with the schedules of the *participating jurisdiction* provided under clause 4.3.2(f) and must, without limitation, include a requirement that:

(1) automatic *disconnection* of a *sensitive load* under clause 4.3.5(a) is not to occur until the occurrence of a specified *power system frequency* referred to in the *load shedding procedures*;

(2) any such *sensitive load* (or part thereof) which would otherwise have been part of a block of *interruptible load* in an under-*frequency* band specified in clause 4.3.5(b), must be replaced in that band in relation to the *participating jurisdiction* with an equivalent amount of *interruptible load* nominated by other *Market Customers* in the relevant *participating jurisdiction*;

(3) after *supply* is interrupted to a *load*, *supply* to that *load* must be restored as soon as this can be achieved and in accordance with the schedules of *loads* referred to in clause 4.3.2(f); and

(4) in the event of a major *supply* shortfall, the rotation of any *load shedding* requirements within *regions* (or parts of *regions*) in the *participating jurisdiction* must be in accordance with the *load shedding procedures*.

(k) Notwithstanding any other provision of the *Rules*, *NEMMCO* must use its reasonable endeavours to ensure that the *power system* is operated in a manner that maintains security of *supply* to any *sensitive loads* prescribed by the *Jurisdictional System Security Coordinator* for each *participating jurisdiction* under clause 4.3.2(f).

(l) (1) Notwithstanding any other provision of the *Rules*, in the event that *NEMMCO*, in its reasonable opinion for reasons of public safety or for *power system security*, needs to interrupt *supply* to any *sensitive loads*, *NEMMCO* may only give a direction requiring that interruption:

(i) in accordance with the *load shedding procedures*; and

(ii) if it is a *sensitive load* of a type described in clause 4.3.2(f)(1)(ii), once the *Jurisdictional System Security Coordinator* for the relevant *participating jurisdiction* has given *NEMMCO* its approval (which approval must not be unreasonably withheld).

(2) Other than to ensure the maintenance of *power system security* or public safety, after *disconnection*, notwithstanding any other provision of the *Rules*, *NEMMCO* must not take any steps to prevent the reconnection of a *sensitive load* of the type described in clause 4.3.2(f)(1)(ii) without the approval of the *Jurisdictional System Security Coordinator* for the relevant *participating jurisdiction* (which approval must not be unreasonably withheld).

(m) **[Deleted]**

(n) **[Deleted]**

4.3.3 The role of System Operators

(a) For the purpose of complying with its obligations under clause 4.3.2, *NEMMCO* may, from time to time, in addition to any other power or right under the *Rules*:

(1) engage such agents or appoint such delegates as it considers appropriate to carry out on its behalf some or all of its rights, functions and obligations under this Chapter (such persons being known as "*System Operators*" upon registration with *NEMMCO*); and

(2) organise, enter into and manage any contractual arrangements with appropriately competent service providers.

(b) *NEMMCO* must make accessible to *Registered Participants* information as to:

(1) the engagement or appointment of any agent, delegate or service provider under clause 4.3.3;

(2) the identity of that agent, delegate or service provider; and

(3) the scope of the engagement or appointment, including without limitation, the activities in relation to which the engagement or appointment applies.

(c) A *Registered Participant* must ensure that, where *NEMMCO* has engaged or appointed an agent, delegate or service provider under clause 4.3.3 in relation to certain of its rights, functions or obligations, any communications from the *Registered Participant* to *NEMMCO* under this Chapter concerning the rights, functions or obligations within the scope of the agent's, delegate's or service provider's engagement or appointment are made through that agent, delegate or service provider to the extent notified to the *Registered Participant* by *NEMMCO*.

(d) A *System Operator* must carry out the rights, functions and obligations in respect of which it has been engaged or appointed by *NEMMCO* in accordance with the provisions of the *Rules*.

(e) A *System Operator* must, to the extent that the *System Operator* is aware or ought reasonably to have been aware, keep *NEMMCO* fully and timely informed as to:

(1) the state of the security of the *power system*;

(2) any present or anticipated risks to *power system security*; and

(3) any action contemplated or initiated to address a risk to *power system security* or to restore or maintain the *power system* in a *satisfactory operating state*.

(f) *NEMMCO* must ensure that any agent engaged, or delegate appointed, under clause 4.3.3(a)(1) is registered by it as a *System Operator*.

(g) Notwithstanding that *NEMMCO* may have engaged or appointed an agent, delegate or service provider under clause 4.3.3 to carry out a right, function or obligation of *NEMMCO*, *NEMMCO* remains liable under the *Rules* for performance of that right, function or obligation.

4.3.4 Network Service Providers

(a) Each *Network Service Provider* must use reasonable endeavours to exercise its rights and obligations in relation to its *networks* so as to co-operate with and assist *NEMMCO* in the proper discharge of the *NEMMCO power system security responsibilities*.

(b) Each *Network Service Provider* must use reasonable endeavours to ensure that *interruptible loads* are provided as specified in clause 4.3.5 and clause S5.1.10 of schedule 5.1 (including without limitation, through the inclusion of appropriate provisions in *connection agreements*).

(c) Each *Network Service Provider* must arrange and maintain, in accordance with the standards described in clause 4.3.4(e), controls, monitoring and secure communication systems to facilitate a manually initiated, rotational *load shedding* and restoration process which may be necessary if there is, in *NEMMCO's* opinion, a prolonged major *supply* shortage or extreme *power system* disruption.

(d) Each *Network Service Provider* must advise *NEMMCO* of any *ancillary services* or similar services provided under any *connection agreement* to which it is a party.

(e) *NEMMCO* must develop, and may amend, standards in consultation with *Network Service Providers* in accordance with the *Rules consultation procedures* which must be met by *Network Service Providers* in arranging and maintaining the controls, monitoring and secure communication systems referred to in clause 4.3.4(c).

(f) Until the standards contemplated by clause 4.3.4(e) are issued by *NEMMCO*, each *Network Service Provider* must maintain the control, monitoring and secure communication systems referred to in clause 4.3.4(c) that were in place at 13 December 1998 so as to achieve substantially the same performance and functionality as they did over the 12 months prior to 13 December 1998.

(g) Each *Network Service Provider* must plan or operate its *transmission system* or *distribution system* in accordance with the *power system* stability guidelines described in clause 4.3.4(h).

(h) *NEMMCO* must develop, and may amend, guidelines for *power system* stability but only in consultation with *Registered Participants* in accordance with the *Rules consultation procedures*, and must *publish* the guidelines for *power system* stability.

(i) The *power system* stability guidelines developed in accordance with clause 4.3.4(h) must detail the policies governing *power system* stability so as to facilitate the operation of the *power system* within stable limits.

4.3.5 Market Customer obligations

(a) All *Market Customers* having expected peak demands at *connection points* in excess of 10 MW, must provide automatic *interruptible load* of the type described in clause S5.1.10 of schedule 5.1. The level of this automatic *interruptible load* must be a minimum of 60% of their expected demand, or such other minimum *interruptible load* level as may be periodically determined by the *Reliability Panel*, to be progressively automatically *disconnected* following the occurrence of a *power system* under-*frequency* condition described in the *power system security and reliability standards*.

(b) *Market Customers* must provide their *interruptible load* in manageable blocks spread over a number of steps within under-*frequency* bands from 49.0 Hz down to 47.0 Hz as nominated by *NEMMCO*.

(c) Any *load shedding* capability the subject of an *ancillary services agreement* or *enabled* as a *market ancillary service* can be counted as automatic *interruptible load* provided for the purposes of clause 4.3.5.

4.4 Power System Frequency Control

4.4.1 Power system frequency control responsibilities

NEMMCO must use its reasonable endeavours to:

(a) control the *power system frequency*; and

(b) ensure that the *frequency operating standards* set out in the *power system security and reliability standards* are achieved.

4.4.2 Operational frequency control requirements

To assist in the effective control of *power system frequency* by *NEMMCO* the following provisions apply:

(a) *NEMMCO* may give *dispatch instructions* in respect of *scheduled generating units, scheduled loads, scheduled network services* and *market ancillary services* pursuant to clause 4.9.

(b) Each *Generator* must ensure that all of its *generating units* have responsive speed *governor systems* in accordance with the requirements of schedule 5.2, so as to automatically share in changes in *power system demand* or loss of *generation* as it occurs through response to the resulting excursion in *power system frequency*.

(c) *NEMMCO* must use its reasonable endeavours to arrange to be available and specifically allocated to *regulating duty* such *generating plant* as

NEMMCO considers appropriate which can be automatically controlled or directed by *NEMMCO* to ensure that all normal *load* variations do not result in *frequency* deviations outside the limitations specified in clause 4.2.2(a).

(d) **[Deleted]**

(e) *NEMMCO* must use its reasonable endeavours to ensure that adequate *facilities* are available and are under the direction of *NEMMCO* to allow the managed recovery of the *satisfactory operating state* of the *power system*.

4.4.3 Generator protection requirements

Generators must, in accordance with schedule 5.2 and Chapter 5, provide any necessary automatically initiated protective device or systems to protect their *plant* and associated *facilities* against abnormal *voltage* and extreme *frequency* excursions of the *power system*.

4.5 Control of Power System Voltage

4.5.1 Power system voltage control

(a) *NEMMCO* must determine the adequacy of the capacity of the *power system* to produce or absorb *reactive power* in the control of the *power system voltages*.

(b) *NEMMCO*, in consultation with *Network Service Providers*, must assess and determine the limits of the operation of the *power system* associated with the avoidance of *voltage* failure or collapse under *single credible contingency event* scenarios.

(c) The limits of operation of the *power system* must be translated by *NEMMCO*, in consultation with *Network Service Providers*, into key location operational *voltage* settings or limits, *transmission line* capacity limits, *reactive power* production (or absorption) capacity or other appropriate limits to enable their use by *NEMMCO* in the maintenance of *power system security*.

(d) The determination referred to in clause 4.5.1(b) must include a review of the dynamic stability of the *voltage* of the *power system*.

(e) *NEMMCO* must use its reasonable endeavours to maintain *voltage* conditions throughout the *power system* so that the *power system* remains in a *satisfactory operating state*.

(f) *NEMMCO* must use its reasonable endeavours to arrange the provision of *reactive power facilities* and *power system voltage* stabilising *facilities* through:

(1) contractual arrangements for *ancillary services* with appropriate *Registered Participants* in accordance with clause 3.11;

(2) negotiation and agreement with appropriate *Network Service Providers*; or

(3) obligations on the part of *Registered Participants* under their *connection agreements* in accordance with clause 3.11.4(b)(1).

(g) Without limitation, such *reactive power facilities* may include:

(1) *synchronous generator voltage controls* (rotor current adjustment) usually associated with *tap-changing transformers*;

(2) *synchronous condensors* (compensators);

(3) *static VAR compensators* (SVC);

(4) *shunt capacitors*;

(5) *shunt reactors*.

4.5.2 Reactive power reserve requirements

(a) *NEMMCO* must use its reasonable endeavours to ensure that sufficient *reactive power reserve* is available at all times to maintain or restore the *power system* to a *satisfactory operating state* after the most critical *contingency event* as determined by previous analysis or by periodic contingency analysis by *NEMMCO*.

(b) If *voltages* are outside acceptable limits, and the means of *voltage* control set out in this clause 4.5 are exhausted, *NEMMCO* must take all reasonable actions, including to direct changes to demand (through selective *load shedding* from the *power system*), additional *generation* operation or reduction in the *transmission line* flows but only to the extent necessary to restore the *voltages* to within the relevant limits. A *Registered Participant* must comply with any such direction.

4.5.3 Audit and testing

NEMMCO must arrange, co-ordinate and supervise the conduct of appropriate tests to assess the availability and adequacy of the provision of *reactive power* to control and maintain *power system voltages* under both *satisfactory operating state* and *contingency event* conditions.

4.6 Protection of Power System Equipment

4.6.1 Power system fault levels

(a) *NEMMCO*, in consultation with *Network Service Providers*, must determine the fault levels at all *busbars* of the *power system* as described in clause 4.6.1(b).

(b) *NEMMCO* must ensure that there are processes in place, which will allow the determination of fault levels for normal operation of the *power system* and in anticipation of all *credible contingency events* that *NEMMCO* considers may affect the configuration of the *power system*, so that *NEMMCO* can identify any *busbar* which could potentially be exposed to a fault level which exceeds the fault *current ratings* of the circuit breakers associated with that *busbar*.

4.6.2 Power system protection co-ordination

NEMMCO must use its reasonable endeavours to co-ordinate, in consultation with the *Network Service Providers*, the protection of *transmission system plant* and equipment that *NEMMCO* reasonably considers could affect *power system security*.

4.6.3 Audit and testing

NEMMCO must use its reasonable endeavours to co-ordinate such inspections and tests as *NEMMCO* thinks appropriate to ensure that the protection of the *power system* is adequate to protect against damage to *power system plant* and equipment.

4.6.4 Short-term thermal ratings of power system

(a) *NEMMCO* may act so as to use, or require or recommend actions which use, the full extent of the thermal ratings of *transmission elements* to maintain *power system security*, including the short-term ratings (being time dependent ratings), as defined by the *Network Service Providers* from time to time.

(b) *NEMMCO* must use its reasonable endeavours not to exceed the ratings defined by the *Network Service Providers* and not to require or recommend action which causes those ratings to be exceeded, to the extent that *NEMMCO* is or ought reasonably to be aware of such ratings.

4.6.5 Partial outage of power protection systems

(a) Where there is an *outage* of one *protection system* of a *transmission line*, *NEMMCO* must determine, in consultation with the relevant *Network*

Service Provider, the most appropriate action. Depending on the circumstances the determination may be:

(1) to leave the *transmission element* in service for a limited duration;

(2) to take the *transmission element* out of service immediately;

(3) to install a temporary *protection system*;

(4) to accept a degraded performance from the *protection system*, with or without additional operational measures or temporary protection measures to minimise *power system* impact; or

(5) to operate the *transmission element* at a lower capacity.

(b) If there is an *outage* of both *protection systems* on a *transmission line* and *NEMMCO* determines this to be an unacceptable risk to *power system security*, *NEMMCO* must take the *transmission element* out of service as soon as possible and advise the appropriate *Network Service Provider* immediately this action is undertaken.

(c) The *Network Service Provider* must comply with a determination made by *NEMMCO* under this clause 4.6.5 unless, in the reasonable opinion of the *Network Service Provider*, it would threaten the safety of any person or cause material damage.

4.7 Power System Stability Co-Ordination

4.7.1 Stability analysis co-ordination

(a) *NEMMCO* must, in cooperation with the relevant *Network Service Providers*, apply the *power system* stability guidelines described in clause 4.3.4(h) to the conduct of all necessary calculations associated with the stable operation of the *power system* and use its reasonable endeavours to coordinate the determination of the settings of equipment used to maintain *power system* stability. The *Network Service Providers* must submit to *NEMMCO* for approval the settings of any *transmission* equipment used to maintain the stable operation of the *power system*.

(b) *NEMMCO* must arrange and endorse the installation of *power system* devices which are approved by *NEMMCO* to be necessary to assist the stable operation of the *power system*.

4.7.2 Audit and testing

NEMMCO must arrange, co-ordinate and supervise the conduct of such inspections and tests as it deems appropriate to assess the availability and adequacy of the devices installed to maintain *power system* stability.

4.8 Power System Security Operations

4.8.1 Registered Participants' advice

A *Registered Participant* must promptly advise *NEMMCO* or a relevant *System Operator* at the time that the *Registered Participant* becomes aware, of any circumstance which could be expected to adversely affect the secure operation of the *power system* or any equipment owned or under the control of the *Registered Participant* or a *Network Service Provider*.

4.8.2 Protection or control system abnormality

(a) If a *Registered Participant* becomes aware that any relevant *protection system* or *control system* is defective or unavailable for service, that *Registered Participant* must advise *NEMMCO*. If *NEMMCO* considers it to be a threat to *power system security*, *NEMMCO* may direct that the equipment protected or operated by the relevant *protection system* or *control system* be taken out of operation or operated as *NEMMCO* directs.

(b) A *Registered Participant* must comply with a direction given by *NEMMCO* under clause 4.8.2(a).

4.8.3 NEMMCO's advice on power system emergency conditions

(a) *NEMMCO* must *publish* all relevant details promptly after *NEMMCO* becomes aware of any circumstance with respect to the *power system* which, in the reasonable opinion of *NEMMCO*, could be expected to materially adversely affect *supply* to or from *Registered Participants*.

(b) Without limitation, such circumstances may include:

(1) electricity *supply* capacity shortfall, being a condition where there are insufficient *generation* or *supply* options available to securely *supply* the total load in a *region*;

(2) unexpected disruption of *power system security*, which may occur when:

(i) an unanticipated major *power system* or *generation plant contingency event* occurs; or

(ii) significant environmental or similar conditions, including weather, storms or fires, are likely to, or are affecting, the *power system*; or

(3) a *black system* condition.

4.8.4 Declaration of conditions

NEMMCO may declare the following conditions in relation to a period of time, either present or future:

(a) *Low reserve* condition - when *NEMMCO* considers that the *short term capacity reserves* or *medium term capacity reserves* for the period being assessed have fallen below those determined by *NEMMCO* as being in accordance with the relevant *short term capacity reserve standards* or *medium term capacity reserve standards*;

(b) *Lack of reserve* level 1 (LOR1) - when *NEMMCO* considers that there is insufficient *short term capacity reserves* available to provide complete replacement of the *contingency capacity reserve* on the occurrence of a *critical single credible contingency event* for the period nominated;

(c) *Lack of reserve* level 2 (LOR2) - when *NEMMCO* considers that the occurrence of a *critical single credible contingency event* is likely to require *involuntary load shedding*;

(d) *Lack of reserve* level 3 (LOR3) - when *NEMMCO* considers that *Customer load* (other than *ancillary services* or contracted *interruptible loads*) would be, or is actually being, interrupted automatically or manually in order to maintain or restore the security of the *power system*.

4.8.5 Managing declarations of conditions

(a) *NEMMCO* must as soon as reasonably practicable *publish* any declaration under clause 4.8.4.

(a1) The *publication* of any such declaration must, to the extent reasonably practicable, include the following:

(1) the nature and extent of the *low reserve* or *lack of reserve* condition; and

(2) the time period over which the *low reserve* or *lack of reserve* condition applies.

(b) If *NEMMCO* makes a declaration under clause 4.8.4, *NEMMCO* must use its reasonable endeavours to follow the processes set out in clauses 4.8.5A and 4.8.5B.

(c) Following a declaration under clause 4.8.4, *NEMMCO* must as soon as reasonably practicable *publish* notice of:

(1) any cancellation of that declaration; or

(2) any significant change in the *low reserve* or *lack of reserve* condition due to changed positions of *Scheduled Network Service Providers, Market Customers* and *Scheduled Generators* or due to other reasons.

4.8.5A Determination of the latest time for intervention by direction or dispatch of reserve contract

(a) *NEMMCO* must immediately *publish* a notice of any foreseeable circumstances that may require *NEMMCO* to issue a *direction* or *dispatch reserves* it has available under *reserve contracts* under clause 4.8.6.

(a1) Any such notice must include the forecast circumstances creating the need to issue a *direction* or *dispatch reserves*.

(b) *NEMMCO* must, as soon as reasonably practicable after the *publication* of a notice pursuant to clause 4.8.5A(a), estimate and *publish* the latest time at which it would need to intervene to issue a *direction* under clause 4.8.9, or *dispatch reserves* it has available under *reserve contracts* under clause 4.8.6, should the response from the *market* not be such as to obviate the need to issue a *direction* or *dispatch reserves*.

(c) In order to estimate the time referred to in clause 4.8.5A(b), *NEMMCO* may request information from a *Scheduled Network Service Provider*, *Scheduled Generator* or *Market Customer* and may specify the time within which that information is to be provided. Such information may include, but is not limited to:

(1) *plant* status;

(2) any expected or planned *plant outages* and the MW capacity affected by the *outage*, proposed start date and time and expected end date and time associated with the *outage* and an indication of the possibility of deferring the *outage*;

(3) estimates of the relevant costs to be incurred by the *Scheduled Network Service Provider, Scheduled Generator* or *Market Customer* should it be the subject of a *direction*, but only if *NEMMCO* considers it reasonably likely that such *Scheduled Network Service Provider, Scheduled Generator* or *Market Customer* will be subject to a *direction*.

(d) A *Scheduled Network Service Provider*, *Scheduled Generator* or *Market Customer* must use reasonable endeavours:

(1) to comply with a request for information pursuant to clause 4.8.5A(c); and

(2) to provide *NEMMCO* with the information required in the time specified by *NEMMCO*.

(e) *NEMMCO* must regularly review its estimate of the latest time at which it would need to intervene to issue a *direction* under clause 4.8.9 or to *dispatch reserves* it has available under *reserve contracts* under clause 4.8.6 and must *publish* any revisions to the estimate.

(f) *NEMMCO* must treat any information provided in response to a request under clause 4.8.5A(c) as *confidential information* and use it for the sole purpose of assessing to which *Scheduled Network Service Provider, Market Customer* or *Scheduled Generator* it should issue *directions*.

4.8.5B Notifications of last time of intervention

If the latest practicable time for the *dispatch* of *reserves*, as estimated by *NEMMCO* under clause 4.8.5A, is reached and, taking into account any *reserve contracts*, the circumstances described under clause 4.8.5A(a) have not been alleviated, *NEMMCO* must to the extent reasonably practicable immediately:

(1) *publish* a notice that *NEMMCO*:

(i) considers the time for the negotiation of further *reserve contracts* in accordance with clause 3.12.1 has elapsed; and

(ii) intends to issue *directions* under clause 4.8.9 or *dispatch reserve* available under *reserve contracts* under clause 4.8.6; and

(2) amend the *pre-dispatch schedule* to ensure that it is a physically realisable schedule for all periods in which *NEMMCO* intends to issue *directions* or *dispatch reserves* available under *reserve contracts*.

4.8.6 NEMMCO utilisation of reserves under contract

(a) Notwithstanding clauses 4.8.4, 4.8.5, 4.8.5A and 4.8.5B, if in *NEMMCO's* opinion the latest time for intervention by *dispatch* of *reserves* it has available under *reserve contracts* has arrived, then *NEMMCO* may *dispatch* such *reserves.*

(b) *NEMMCO* must follow the relevant procedures in clause 4.8 prior to *dispatching plant* the subject of a *reserve contract* unless it is not reasonably practicable to do so.

(b1) Subject to clause 4.8.6(b), *NEMMCO* must only *dispatch plant* the subject of a *reserve contract* in accordance with the procedures developed pursuant to clause 4.8.6(c).

(b2) In order to effect the *dispatch* of *plant* the subject of a *reserve contract NEMMCO* may:

(1) submit, update or vary *dispatch bids* or *dispatch offers* in relation to all or part of a *scheduled generating unit*, *scheduled network service* or *scheduled load* which is the subject of a *reserve contract*; or

(2) change other inputs to the *dispatch* process to give effect to the *dispatch* of *reserves*.

(c) *NEMMCO* must develop, and may amend from time to time, in accordance with the *Rules consultation procedures*, procedures for the *dispatch* of *reserves* it has available under *reserve contracts* pursuant to clause 4.8.6(a). Such procedures must reflect the following principles:

(1) *NEMMCO* must use its reasonable endeavours to minimise the cost of *dispatching reserves* and compensation to *Affected Participants* and *Market Customers* pursuant to clause 3.12.11 and compensation to *Directed Participants* pursuant to clauses 3.15.7 and 3.15.7A;

(2) the instruction to *dispatch reserves* is to be revoked as soon as *NEMMCO* determines the *dispatch* of such *reserves* is no longer required; and

(3) *NEMMCO* must take into account the procedures developed pursuant to clause 4.8.9(b).

(d) **[Deleted]**

(e) *NEMMCO* must take into account any guidelines and policies for the provision of *reserves* issued by the *Reliability Panel* pursuant to clause 8.8.1(a)(4).

4.8.7 Managing a power system contingency event

(a) During the period when the *power system* is affected by a *contingency event NEMMCO* must carry out actions, in accordance with the guidelines set out in the *power system security and reliability standards* and its obligations concerning *sensitive loads*, to:

(1) identify the impact of the *contingency event* on *power system security* in terms of the capability of *generating units* or *transmission* or *distribution networks*; and

(2) identify and implement the actions required in each affected *region* to restore the *power system* to its *satisfactory operating state*.

(b) When *contingency events* lead to potential or actual electricity *supply* shortfall events, *NEMMCO* must follow the procedures outlined in clause 4.8.9.

4.8.8 [Deleted]

4.8.9 Power to issue directions and clause 4.8.9 instructions

(a) Notwithstanding any other provision of clause 4.8:

(1) *NEMMCO* may require a *Registered Participant* to do any act or thing if *NEMMCO* is satisfied that it is necessary to do so to maintain or re-establish the *power system* to a *secure operating state*, a *satisfactory operating state*, or a *reliable operating state*; and

(2) *NEMMCO* may authorise a person to do any of the things contemplated by section 116 of the *National Electricity Law* if *NEMMCO* is satisfied that it is necessary to do so for reasons of public safety or the security of the electricity system.

(a1) If *NEMMCO*, or a person authorised by *NEMMCO*, requires a *Registered Participant* to:

(1) take action as contemplated by clause 4.8.9(a) or section 116 of the *National Electricity Law* in relation to *scheduled plant* or a *market generating unit*, *NEMMCO* is taken to have issued a *direction*; or

(2) take some other action contemplated by clause 4.8.9(a) or section 116 of the *National Electricity Law*, *NEMMCO* is taken to have issued a *clause 4.8.9 instruction*.

(a2) *NEMMCO* must use reasonable endeavours to ensure that persons authorised by *NEMMCO* under clause 4.8.9(a)(2) follow all relevant processes in clause 4.8 prior to issuing a *direction*, unless it is not reasonably practical to do so.

(b) *NEMMCO* must develop, and may amend from time to time, in accordance with the *Rules consultation procedures*, procedures for the issuance of *directions*. Such procedures must reflect the following principles:

(1) *NEMMCO* must use its reasonable endeavours to minimise any cost related to *directions* and compensation to *Affected Participants* and *Market Customers* pursuant to clause 3.12.11 and compensation to *Directed Participants* pursuant to clauses 3.15.7 and 3.15.7A;

(2) a *direction* should be revoked as soon as *NEMMCO* determines that the *direction* is no longer required;

(3) *NEMMCO* must take into account any applicable guidelines issued by the *Reliability Panel*;

(4) *NEMMCO* must observe its obligations under clause 4.3.2 concerning *sensitive loads*;

(5) *NEMMCO* must expressly notify a *Directed Participant* that *NEMMCO's* requirement or that of another person authorised by *NEMMCO* pursuant to clause 4.8.9(a) is a *direction*.

(b1) **[Deleted]**

(c) A *Registered Participant* must use its reasonable endeavours to comply with a *direction* or *clause 4.8.9 instruction* unless to do so would, in the *Registered Participant's* reasonable opinion, be a hazard to public safety, or materially risk damaging equipment, or contravene any other law.

(c1) Subject to clause 4.8.9(c) a *Registered Participant* must use its best endeavours to comply with a *direction* or *clause 4.8.9 instruction* in accordance with the timeframe specified by *NEMMCO* in the *direction* or *clause 4.8.9 instruction.*

(c2) A *Market Participant* must not by any act or omission, whether intentionally or recklessly, cause or significantly contribute to the circumstances causing a *direction* to be issued, without reasonable cause.

(d) A *Registered Participant* must immediately notify *NEMMCO* of its inability to comply or its intention not to comply with a *direction* or *clause 4.8.9 instruction*.

(e) If a *Registered Participant* does not comply with a *direction* or *clause 4.8.9 instruction*, it must within 2 *business days* of the *direction* or *clause 4.8.9 instruction* deliver to *NEMMCO* and the *AER* a report detailing the reasons for the non compliance together with all relevant facts.

(f) *NEMMCO* must *publish* a report in accordance with clause 3.13.6A.

(g) **[Deleted]**

(h) *NEMMCO's* obligations and powers under clause 4.8.9(a) to issue a *direction* or *clause 4.8.9 instruction* to maintain or re-establish the *power system* in a *reliable operating state* cease when *NEMMCO's* right to enter into contracts for the provision of *reserves* in accordance with clause 3.12 ceases.

(i) Any *Registered Participant* who is aware of a failure to comply with a *direction* or *clause 4.8.9 instruction* or who believes any such failure has taken place must notify *NEMMCO* and the *AER* in writing and as soon as practicable of that fact.

(j) If *NEMMCO* issues a *direction* or *clause 4.8.9 instruction*, *NEMMCO* may, to give effect to the *direction* or *clause 4.8.9 instruction*:

(1) submit, update or vary *dispatch bids*, *dispatch offers* or *rebids* in relation to the *plant* of *Directed Participants* and *Affected Participants*;

(2) change other inputs to the *dispatch process*; or

(3) select a *Market Participant* or *Market Participants* to become *Affected Participants* to implement clause 3.8.1(b)(11).

(k) When issuing *clause 4.8.9 instructions* to implement *load shedding* across *interconnected regions*, *NEMMCO* must use reasonable endeavours to implement *load shedding* in an equitable manner as specified in the *power system security and reliability standards*, taking into account the *power transfer capability* of the relevant *networks.*

(l) When issuing *clause 4.8.9 instructions* to implement *load shedding*, *NEMMCO* must comply with its obligations under clauses 4.3.2(e) to (l) and Part 8 of the *National Electricity Law*.

(m) **[Deleted]**

4.8.9A System security directions

(a) Notwithstanding any other provision of the *Rules*, a *Registered Participant* must follow any *direction* issued by or on behalf of *NEMMCO* and with which that *Registered Participant* is required to comply under Chapter 4 or section 116 of the *National Electricity Law*.

(b) Any event or action required to be performed pursuant to a *direction* issued under Chapter 4 or section 116 of the *National Electricity Law* on or by a stipulated *day* is required by the *Rules* to occur on or by that *day*, whether or not a *business day*.

(c) Any failure to observe such a *direction* will be deemed to be a breach of the *Rules*.

(d) *NEMMCO* or any *Registered Participant* who is aware of any such failure must notify the *AER* in writing of the failure.

4.8.10 Disconnection of generating units and market network services

(a) Where, under the *Rules*, *NEMMCO* has the authority or responsibility to *disconnect* a *generating unit* or a *market network service*, then it may do so (either directly or through any agent) as described in clause 5.9.

(b) The relevant *Generator* or *Market Network Service Provider* must provide all reasonable assistance to *NEMMCO* for the purpose of such *disconnection*.

4.8.11 [Deleted]

4.8.12 Local black system procedures

(a) Each *Generator* and *Market Network Service Provider* must develop draft *local black system procedures* for each of its *power stations* and each of its *network elements* which contribute to the provision of *market network services* and must submit those procedures for approval by *NEMMCO*.

(b) *NEMMCO* may request amendments to draft *local black system procedures* or any proposed changes as *NEMMCO* reasonably considers necessary by notice in writing to a *Generator* or *Market Network Service Provider*.

(c) If *NEMMCO* and a *Generator* or *Market Network Service Provider* are unable to agree on the amendments, the matter may be dealt with under the dispute resolution procedures in clause 8.2.

4.8.13 Testing of black start-up facilities and local black system procedures

(a) Each *Generator* providing *black start-up facilities* must arrange for the testing of:

(1) its *black start-up facilities* which are the subject of an *ancillary services agreement*; and

(2) the approved *local black system procedures*,

to be carried out in accordance with *NEMMCO's* reasonable requirements at intervals nominated by *NEMMCO*, not exceeding 12 months, to demonstrate that:

(3) each of the *black start-up facilities* is capable of start-up from a condition where it is *disconnected* from external power supplies; and

(4) the arranged *black start-up facilities* can actually start up the nominated *generating units* without assistance from the *power system*.

(b) Each *Generator* providing *black start-up facilities* must ensure that the auxiliary *plant* associated with those *black start-up facilities* is fully tested at intervals not exceeding three months.

4.8.14 Black system start-up

(a) *NEMMCO* must advise a *Registered Participant* if, in *NEMMCO's* reasonable opinion, there is a *black system* condition which is affecting, or which may affect, that *Registered Participant*.

(b) If a *Generator* or *Market Network Service Provider* is bound to provide *system restart* to *NEMMCO* under an *ancillary services agreement*, then the *local black system procedures* for that *Generator* or *Market Network Service Provider* must be consistent with that *ancillary services agreement*.

(c) *NEMMCO* may by notice in writing to the relevant *Generator* or *Market Network Service Provider* require such amendments to the *local black system procedures* for that *Generator* or *Market Network Service Provider* which, in its reasonable opinion, are needed for consistency with:

(1) actual *power system* requirements; or

(2) if the *Generator* or *Market Network Service Provider* is bound to provide *system restart* to *NEMMCO* under an *ancillary services agreement*, the relevant *ancillary services agreement*.

(d) If *NEMMCO* advises a *Generator* or *Market Network Service Provider* of a *black system* condition, and/or if the terms of the relevant *local black system procedures* require the *Generator* or *Market Network Service Provider* to take action, then the *Generator* or *Market Network Service Provider* must comply with the requirements of the *local black system procedures*.

(e) If there is a *black system* condition, then a *Market Customer* must comply with *NEMMCO's* instructions with respect to the timing and magnitude of *load* restoration.

4.8.15 Review of operating incidents

(a) Except where *NEMMCO* is required to carry out a review under clause 3.14.3(c) in respect of an event or circumstance, *NEMMCO* must conduct reviews of significant operating incidents or deviations from normal operating conditions in order to assess the adequacy of the provision and response of *facilities* or services, and the appropriateness of actions taken to restore or maintain *power system security*.

(b) For all cases where *NEMMCO* has been responsible for the *disconnection* of a *Registered Participant's facilities* under the circumstances described in clause 5.9.5, a report of the review carried out in accordance with this clause 4.8.15 must be provided by *NEMMCO* to the *Registered Participant*, the *AEMC* and the *AER* advising of the circumstances requiring that action. Where the report relates to operating incidents which were of significance to the operation of the *power system*, the report of the review carried out in accordance with this clause 4.8.15 must be made available to *Registered Participants* and the public.

(c) A *Registered Participant* must co-operate in any such review conducted by *NEMMCO* (including making available relevant records and information).

(d) A *Registered Participant* must provide to *NEMMCO* such information relating to the performance of its equipment during and after particular *power system* incidents or operating condition deviations as *NEMMCO* reasonably requires for the purposes of analysing or reporting on those *power system* incidents or operating condition deviations.

(e) *NEMMCO* must provide to a *Registered Participant* such information or reports relating to the performance of that *Registered Participant's* equipment during *power system* incidents or operating condition deviations as that *Registered Participant* reasonably requests and in relation to which *NEMMCO* is required to conduct a review under this clause 4.8.15.

4.9 Power System Security Related Market Operations

4.9.1 Load forecasting

(a) *NEMMCO* must produce (at the intervals indicated and in accordance with the timetable) an indicative *load* forecast for each *region* for the periods indicated below:

(1) each *day*, a forecast for the *day* ahead, such forecast divided into half-hourly *load* forecasts for each *trading interval*;

(2) each *day*, a forecast for 2 to 7 *days* (inclusive) ahead, the forecasts for each *day* divided into half-hourly *load* forecasts for each *trading interval*;

(3) every week, a forecast for the 24 *months* ahead of the *day* on which the forecast is produced, with a daily profile based on an estimated weekly peak load condition with allowances for weekends and holidays.

(b) These forecasts must provide an indicative estimate of the total *generation* capacity required to meet the forecast *load* (called “forecast load (as

generated)"), and an equivalent estimation of the *supply* required to be delivered to the relevant *transmission network* (called "forecast load (sent out)").

(c) The following factors must be taken into account in the development of the *load* forecasts, to the extent that such are relevant to the particular forecast:

(1) the annual *load* forecasts and *load* profiles collected by the *Network Service Providers* from all *Registered Participants* as required by schedule 5.7, including *load* management expectations and expected *sent out generation* from *embedded generating units*;

(2) historic *load* data, including *transmission* losses and *power station* in-house use of the *generated* output;

(3) weather forecasts and the current and historic weather conditions and pattern;

(4) the incidence of major events or activities which are known to *NEMMCO*;

(5) anticipated pumped storage *loads*;

(6) official economic activity forecasts from *participating jurisdictions*; and

(7) other information provided by *Registered Participants*.

(d) *NEMMCO* must develop a methodology to create the indicative *load* forecasts.

(e) A 10% probability of exceedence of *load* forecast must be adopted for the purposes of determination of *short term capacity reserve* and *medium term capacity reserve* requirements under the *power system security and reliability standards*.

(f) *NEMMCO* must aggregate the regional forecasts to produce a total *interconnected transmission network* indicative *load* schedule for use in *NEMMCO* processes such as the determination of the required levels of *short term capacity reserves*, *medium term capacity reserves*, the *PASA* assessments and *pre-dispatch schedules*.

(g) The *load* forecasts produced by *NEMMCO* are indicative only as *NEMMCO* has no direct influence over *Market Participants* in their decisions about their level of demand and, accordingly, no person may claim any loss or damage from *NEMMCO* as a result of any difference between *load* forecasts and actual *load*.

4.9.2 Dispatch instructions to Scheduled Generators

(a) To implement *central dispatch* or, where *NEMMCO* has the power to direct or to instruct a *Scheduled Generator* either under Chapter 3 or this Chapter, then for the purpose of giving effect to that direction or instruction, *NEMMCO* may at any time give an instruction to a *Scheduled Generator* in relation to any of its *scheduled generating units* (a "*dispatch instruction*"), in accordance with clause 4.9.5(b), nominating:

(1) whether the facilities for *generation* remote control by *NEMMCO*, if available, are required to be in service; and

(2) the level or schedule of power to be supplied by the *generating unit* over the specified period.

(3) **[Deleted]**

(4) **[Deleted]**

(5) **[Deleted]**

(b) Subject to paragraph (b1), *NEMMCO* may at any time give an instruction to a *Scheduled Generator* in relation to any of its *scheduled generating units* nominating that:

(1) the *generating unit* transformer be set to a nominated tap position (if it has on-load tap changing capability);

(2) the *generating unit's excitation control system voltage* set-point be set to give a nominated *voltage* at its terminals; or

(3) the *generating unit* will be operated to supply or absorb a nominated level of *reactive power* at its terminals.

(b1) Unless otherwise provided under an *ancillary services agreement* or a *connection agreement*, *NEMMCO* may not give an instruction under paragraph (b) that requires a *generating unit* to supply or absorb *reactive power* at its terminals at a level which is outside the mandatory capability for that *generating unit* determined in accordance with clause S5.2.5.1 of schedule 5.2.

(c) A *Scheduled Generator* must, with respect to *scheduled generating units* which have an availability offer of greater than 0 MW (whether *synchronised* or not), ensure that appropriate personnel are available at all times to receive and immediately act upon *dispatch instructions* issued to the *Scheduled Generator* by *NEMMCO*.

4.9.2A Dispatch Instructions to Scheduled Network Service Providers

(a) Where *NEMMCO* has the power to direct or to instruct a *Scheduled Network Service Provider* either under Chapter 3 or this Chapter then, for the purpose of giving effect to that direction or instruction, *NEMMCO* may at any time give an instruction to a *Scheduled Network Service Provider* in relation to any of its *scheduled network services (*a *"dispatch instruction"),* in accordance with clause 4.9.5(b), nominating:

(1) whether the facilities for remote control by *NEMMCO,* if available, are required to be in service; and

(2) the level or schedule of power to be transferred by the *network service* over the specified service.

(b) **[Deleted]**

(c) A *Scheduled Network Service Provider* must, with respect to *scheduled network services* which have an availability offer of greater than 0 MW, ensure that appropriate personnel are available at all times to receive and immediately act upon *dispatch instructions* issued to the *Scheduled Network Service Provider* by *NEMMCO*.

4.9.3 Instructions to Registered Participants

(a) *NEMMCO* may, at any time, give instructions to *Registered Participants* to reduce their *load* for electricity consistent with *dispatch bids* made in accordance with Chapter 3 ("*dispatch instructions*").

(b) **[Deleted]**

(c) **[Deleted]**

(d) A *Market Customer* must, with respect to *scheduled loads* in relation to which a *dispatch offer* has been submitted for a particular *trading interval*, ensure that appropriate personnel and/or electronic facilities are available at all times to receive and immediately act upon *dispatch instructions* issued to the *Market Customer* by *NEMMCO*.

(e) **[Deleted]**

4.9.3A Ancillary services instructions

(a) *NEMMCO* may at any time give an instruction (a "*dispatch instruction*") to a *Market Participant* which has classified one or more of its *generating units* or *market loads* as an *ancillary service generating unit* or an *ancillary service load*:

(1) stating that the relevant *generating unit* or *load* has been selected for the provision of a *market ancillary service;*

(2) stating the *market ancillary service* concerned; and

(3) nominating the range to be *enabled*.

(b) *NEMMCO* may at any time give an instruction (a "*dispatch instruction*") to a *Registered Participant* with which *NEMMCO* has an *ancillary services agreement* in relation to the provision of *non-market ancillary services* under that *ancillary services agreement* or which *NEMMCO* is otherwise entitled to give under that *ancillary services agreement*.

(c) A *Market Participant* which has:

(1) classified one or more of its *generating units* or *market loads* as an *ancillary service generating unit* or an *ancillary service load*; and

(2) submitted a *market ancillary service offer* in respect of that *generating unit* or *load*,

must ensure that appropriate personnel or electronic facilities are available at all times to receive and immediately act upon *dispatch instructions* issued to the *Market Participant* by *NEMMCO*.

(d) A *Registered Participant* with which *NEMMCO* has an *ancillary services agreement* must ensure that appropriate personnel or electronic facilities are available in accordance with that agreement at all times to receive and immediately act upon *dispatch instructions* issued to the *Registered Participant* by *NEMMCO*.

4.9.3B Compliance with dispatch instructions

(a) A *dispatch instruction* applies from the time it is given (or any later time specified in the *dispatch instruction*) until the earlier of:

(1) the cessation time specified in the *dispatch instruction* (if any); or

(2) the time when the next *dispatch instruction* applies.

(b) **[Deleted]**

4.9.4 Dispatch related limitations on Scheduled Generators

A *Scheduled Generator* must not, unless in the *Scheduled Generator's* reasonable opinion public safety would otherwise be threatened or there would be a material risk of damaging equipment or the environment:

(a) send out any *energy* from a *scheduled generating unit*, except:

(1) in accordance with the *self-commitment* procedures specified in clause 4.9.6 up to the *self-dispatch level*;

(2) in accordance with a *dispatch instruction*;

(3) as a consequence of operation of the *generating unit's* automatic *frequency response mode* to *power system* conditions;

(4) in response to remote control signals given by *NEMMCO* or its agent; or

(5) in connection with a test conducted in accordance with the requirements of this Chapter or Chapter 5;

(b) adjust the *transformer tap position* or *excitation control system voltage* set-point of a *scheduled generating unit* except:

(1) in accordance with a *dispatch instruction*;

(2) in response to remote control signals given by *NEMMCO* or its agent;

(3) if, in the *Scheduled Generator's* reasonable opinion, the adjustment is urgently required to prevent material damage to the *Scheduled Generator's plant* or associated equipment, or in the interests of safety; or

(4) in connection with a test conducted in accordance with the requirements of clause 5.7;

(c) *energise* a *connection point* in relation to a *scheduled generating unit* without prior approval from *NEMMCO*. This approval must be obtained immediately prior to *energisation*;

(d) *synchronise* a *scheduled generating unit* to, or *de-synchronise* a *scheduled generating unit* from, the *power system* without prior approval from *NEMMCO* or other than in response to a *dispatch instruction* except *de-synchronisation* as a consequence of the operation of automatic

protection equipment or where such action is urgently required to prevent material damage to *plant* or equipment or in the interests of safety;

(e) change the *frequency response mode* of a *scheduled generating unit* without the prior approval of *NEMMCO*; or

(f) remove from service or interfere with the operation of any *power system* stabilising equipment installed on that *generating unit*.

4.9.4A Dispatch related limitations on Scheduled Network Service Providers

A *Scheduled Network Service Provider* must not, unless in the *Scheduled Network Service Provider's* reasonable opinion public safety would otherwise be threatened or there would be a material risk of damaging equipment or the environment:

(a) *energise* a *connection point* in relation to a *scheduled network service* without prior approval from *NEMMCO.* This approval must be obtained immediately prior to *energisation;* or

(b) *synchronise* a *scheduled network service* to, or *de-synchronise* a *scheduled network service* from, the *power system* without prior approval from *NEMMCO* except *de-synchronisation* as a consequence of the operation of automatic protection equipment or where such action is urgently required to prevent material damage to *plant* or equipment or in the interests of safety.

4.9.5 Form of dispatch instructions

(a) A *dispatch instruction* for a *scheduled generating unit*, a *dispatch instruction* for a *scheduled network service* and a *dispatch instruction* for a *scheduled load* (including aggregated *generating units, scheduled network services* or *scheduled loads* as described in clause 3.8.3) must include the following:

(1) specific reference to the *scheduled generating unit* (including any aggregated *generating unit*), *scheduled network service* or *scheduled load* or other *facility* to which the *dispatch instruction* applies;

(2) the desired outcome of the *dispatch instruction* such as *active power*, *reactive power*, *transformer* tap or other outcome;

(3) in the case of a *dispatch instruction* under clause 4.9.2, the *ramp rate* (if applicable) which is to be followed by the *generating unit* or a specific target time to reach the outcome specified in the *dispatch instruction*;

(4) the time the *dispatch instruction* is issued; and

(5) if the time at which the *dispatch instruction* is to take effect is different from the time the *dispatch instruction* is issued, the start time.

(a1) A *dispatch instruction* for an *ancillary service* must include:

(1) specific reference to the *generating unit* or *load* to which the *dispatch instruction* applies;

(2) the desired outcome of the *dispatch instruction*;

(3) the time the *dispatch instruction* is issued; and

(4) if the time at which the *dispatch instruction* is to take effect is different from the time the *dispatch instruction* is issued, the start time.

(b) The *dispatch instruction* must be provided as provided in clause 3.8.21.

4.9.6 Commitment of scheduled generating units

(a) Self-commitment

(1) In relation to any *scheduled generating unit*, the *Scheduled Generator* must confirm with *NEMMCO* the expected *synchronising* time at least one hour before the expected actual *synchronising* time, and update this advice 5 minutes before *synchronising* unless otherwise agreed with *NEMMCO*. *NEMMCO* may require further notification immediately before *synchronisation*.

(2) The *Scheduled Generator* must advise *NEMMCO* when a *generating unit* reaches the *self-dispatch level* (being a *self-dispatch level* that is greater than zero MW) and must not increase output above that level unless instructed otherwise by *NEMMCO* to increase output or unless the increase in output results from the *generating unit* being placed under remote control to be loaded in accordance with Chapter 3.

(b) Instructions by *NEMMCO* to commit a *generating unit* for service

(1) A *dispatch instruction* for a *scheduled generating unit* to commit given by *NEMMCO* in response to a *dispatch offer* must be consistent with the start-up time specified in the latest *dispatch offer* in relation to the *generating unit*.

(2) When *NEMMCO* issues a *dispatch instruction* to a *generating unit* for *commitment*, *NEMMCO* must nominate the time at which the *generating unit* is to be *synchronised*.

(3) After a *dispatch instruction* for *commitment* of a *generating unit* has been issued, the relevant *Scheduled Generator* must promptly advise *NEMMCO* of any inability to meet the nominated time to *synchronise*.

(4) Unless instructed otherwise by *NEMMCO*, at the time a *dispatch instruction* to *commit* takes effect, the relevant *generating unit* must remain on *self-dispatch level* until *NEMMCO* issues a further *dispatch instruction*.

4.9.7 De-commitment, or output reduction, by Scheduled Generators

(a) In relation to any *scheduled generating unit*, the *Scheduled Generator* must confirm with *NEMMCO* the expected *de-synchronising* time at least one hour before the expected actual *de-synchronising* time, and update this advice 5 minutes before *de-synchronising* unless otherwise agreed with *NEMMCO*. *NEMMCO* may require further notification immediately before *de-synchronisation*.

(b) The *Scheduled Generator* must not de-commit a *generating unit* unless it has confirmed with *NEMMCO*:

(1) the time to commence decreasing the output of the *generating unit*;

(2) the *ramp rate* to decrease the output of the *generating unit*;

(3) the time to *de-synchronise* the *generating unit*; and

(4) the output from which the *generating unit* is to be *de-synchronised*.

4.9.8 General responsibilities of Registered Participants

(a) A *Registered Participant* must comply with a *dispatch instruction* given to it by *NEMMCO* unless to do so would, in the *Registered Participant's* reasonable opinion, be a hazard to public safety or materially risk damaging equipment.

(b) A *Scheduled Generator* must ensure that each of its *scheduled generating units* is at all times able to comply with the latest *generation dispatch offer* under Chapter 3 in respect of that *generating unit*.

(b1) A *Scheduled Network Service Provider* must ensure that each of its *scheduled network services* is at all times able to comply with the latest *network dispatch offer* under Chapter 3 in respect of that *market network service.*

(c) A *Registered Participant* must ensure that each of its *facilities* is at all times able to comply with any relevant *dispatch bid* under Chapter 3 in respect of the *facility* (as adjusted by any subsequent restatement of that bid under Chapter 3).

(d) A *Market Participant* which has classified a *generating unit* or *load* as an *ancillary service generating unit* or an *ancillary service load*, as the case may be, must ensure that the *ancillary service generating unit* or *ancillary service load* is at all times able to comply with the latest *market ancillary service offer* for the relevant *trading interval*.

4.9.9 Scheduled Generator plant changes

A *Scheduled Generator* must, without delay, notify *NEMMCO* of any event which has changed or is likely to change the operational availability of any of its *scheduled generating units*, whether the relevant *generating unit* is *synchronised* or not, as soon as the *Scheduled Generator* becomes aware of the event.

4.9.9A Scheduled Network Service Provider plant changes

A Scheduled Network Service Provider must, without delay, notify *NEMMCO* of any event which has changed or is likely to change the operational availability of any of its *scheduled network services* as soon as the *Scheduled Network Service Provider* becomes aware of the event.

4.9.9B Ancillary service plant changes

A Market Participant which has classified a *generating unit* or *load* as an *ancillary service generating unit* or an *ancillary service load* must, without delay, notify *NEMMCO* of any event which has changed or is likely to change the availability of a *market ancillary service*, or the capability of the *generating unit* or *load* to respond in the manner contemplated by the *market ancillary service specification*, as soon as the *Market Participant* becomes aware of the event.

4.10 Power System Operating Procedures

4.10.1 Power system operating procedures

(a) The *power system operating procedures* are:

(1) any instructions which may be issued by *NEMMCO* from time to time covering *market* operations and relating to the operation of the *power system*;

(2) any guidelines issued from time to time by *NEMMCO* in relation to *power system security*;

(3) regional specific *power system operating procedures* covering the operational activities and associated responsibilities of the relevant *Network Service Provider* and any *Registered Participants* connected to the relevant *transmission network* and operational activities for operational elements of the *transmission network* which interface with *Scheduled Generators* and other *Registered Participants* including, but not limited to, those relating to *sensitive loads*;

(4) the *load shedding procedures*; and

(5) any other procedures, instructions or guidelines which *NEMMCO* nominates to be and advises to *Registered Participants* as being *power system operating procedures* from time to time.

(b) *NEMMCO* must compile the *regional specific power system operating procedures* in conjunction with the relevant *Network Service Providers* and the relevant *Jurisdictional System Security Coordinators* to the extent required under clause 4.10.1(a)(3).

(c) *NEMMCO* must ensure that the various elements of the *power system operating procedures* are consistent with the *load shedding procedures*.

4.10.2 Transmission network operations

(a) *NEMMCO* must exercise any power granted to it by the *Rules* or the *power system operating procedures* to:

(1) approve the manner in which operations are carried out on a *transmission network* by the relevant *Network Service Provider*; or

(2) instruct the relevant *Network Service Provider* to take any action on the *transmission network*,

in accordance with the appropriate *power system operating procedures*.

(b) A *Registered Participant* must observe the requirements of the relevant *power system operating procedures*.

(c) *Registered Participants* must operate their equipment interfacing with a *transmission network* in accordance with the requirements of Chapter 5, any applicable *connection agreement*, *ancillary services agreement*, and the associated *power system operating procedures*.

(d) *Registered Participants* must ensure that *transmission network* operations performed on their behalf are undertaken by authorised persons advised in writing to *NEMMCO*.

(e) *NEMMCO* must ensure the regular review and update of the *regional specific power system operating procedures*.

4.10.3 Operating interaction with distribution networks

(a) *NEMMCO* and each *Distribution System Operator* must maintain effective communications concerning the conditions of its *distribution network* and the *transmission network* or other *distribution network* to which that *distribution network* is *connected* and to co-ordinate activities where operations are anticipated to affect other *transmission* or *distribution networks*.

(b) *NEMMCO* must use its reasonable endeavours to give at least 3 *days*' notice to all affected *Distribution System Operators* prior to a *Transmission Network Service Provider* carrying out switching related to a *transmission network* which could reasonably be expected to affect security of *supply* to any *distribution network.*

4.10.4 Switching of a Distributor's high voltage networks

(a) A *Distribution System Operator* must use reasonable endeavours to give *NEMMCO* at least 3 *days*' prior notice of plans to carry out switching related to the *high voltage* network which could reasonably be expected to materially affect power flows at points of *connection* to a *transmission network*. The *Distribution System Operator* must also notify *NEMMCO* immediately prior to carrying out any such switching.

(b) A *Distribution System Operator* must provide confirmation to *NEMMCO* of any such switching immediately after it has occurred.

4.10.5 Switching of reactive power facilities

(a) *NEMMCO* may instruct a *Distribution System Operator* to place *reactive power facilities* belonging to or controlled by that *Distribution System Operator* into or out of service for the purposes of maintaining *power system security* where prior arrangements concerning these matters have been made between *NEMMCO* and the *Distribution System Operator*.

(b) Without limitation to its obligations under such prior arrangements, a *Distribution System Operator* must use reasonable endeavours to comply with such an instruction given by *NEMMCO* or its authorised agent.

4.10.6 Automatic reclose

(a) A *Network Service Provider* or a *Distribution System Operator* may request *NEMMCO* to disable or enable *automatic reclose equipment* in relation to a particular *transmission* or *distribution network* circuit or a feeder connecting its *distribution network* to a *transmission network* which has *automatic reclose equipment* installed on it.

(b) If a *Distribution System Operator* makes such a request, then *NEMMCO* must use reasonable endeavours to comply with the request as soon as reasonably practical.

(c) *NEMMCO* is not responsible for the consequences of automatic reclosure in relation to a circuit or a feeder and the *Distribution System Operator* must indemnify *NEMMCO* against any loss or damage arising out of *NEMMCO* complying with such a request unless the loss or damage is due to the failure by *NEMMCO* to comply with the request within a reasonable period of time.

4.10.7 Inspection of facilities by NEMMCO

NEMMCO may inspect a *facility* of a *Registered Participant* as specified in clause 5.7.1.

4.11 Power System Security Support

4.11.1 Remote control and monitoring devices

(a) All remote control, operational *metering* and monitoring devices and local circuits as described in schedules 5.2, 5.3 and 5.3a, must be installed and maintained in accordance with the standards and protocols determined and advised by *NEMMCO* (for use in the *control centres*) for each:

(1) *scheduled generating unit connected* to the *transmission* or *distribution network*; and

(2) *substation* connected to the *network.*

(b) The provider of any *ancillary services* must arrange the installation and maintenance of all *remote control equipment* and *remote monitoring equipment* in accordance with the standards and protocols determined and advised by *NEMMCO* for use in the relevant *control centre*.

(c) The control and monitoring devices must include provision for indication of *active power* and *reactive power* output, provision for signalling the status and any associated alarm condition relevant to achieving adequate control of the *transmission network*, and provision for indication of *generating plant* active and reactive output.

(d) Where reasonably necessary to allow *NEMMCO* to discharge its *market* and *power system security* functions *NEMMCO* may, by notice in writing, require a *Network Service Provider*, a *Generator* or a *Market Network Service Provider* to:

(1) install *remote monitoring equipment* which, in *NEMMCO's* reasonable opinion, is adequate to enable *NEMMCO* to remotely monitor the performance of a *transmission system* or *distribution system*, *generating unit* (including its *dynamic performance*) or a *market network service facility* as appropriate; and

(2) upgrade, modify or replace any *remote monitoring equipment* already installed in a *facility* provided that the existing *remote monitoring equipment* is, in the reasonable opinion of *NEMMCO*, no longer fit for the intended purpose.

(e) A *Network Service Provider*, *Generator* or *Market Network Service Provider* who receives a notice in accordance with clause 4.11.1(d), must comply with the notice within 120 *business days* or such further period that *NEMMCO* requires.

(f) **[Deleted]**

(g) A *Generator* or *Market Network Service Provider* wishing to receive *dispatch instructions* electronically from *NEMMCO's automatic generation control system* under clause 3.8.21(d) must comply with *NEMMCO's* reasonable requirements in respect of how the remote control signals are issued by the *automatic generation control system* and transmitted to the *facility*.

4.11.2 Operational control and indication communication facilities

(a) Each *Network Service Provider* must provide and maintain, in accordance with the standards referred to in clause 4.11.2(c), the necessary primary and, where nominated by *NEMMCO*, back-up communications facilities for control, operational *metering* and indication from the relevant local sites to the appropriate interfacing termination as nominated by *NEMMCO*.

(b) *NEMMCO* must provide and maintain the communication facilities between control centres of each *Transmission Network Service Provider*, on the one hand, and the *NEMMCO co-ordinating centre*, on the other hand.

(c) *NEMMCO* must develop, and may amend, standards in consultation with *Network Service Providers* in accordance with the *Rules consultation procedures* which must be met by *Network Service Providers* in providing and maintaining the facilities referred to in clause 4.11.2(a).

(d) Until the standards contemplated by clause 4.11.2(c) are issued by *NEMMCO*, each *Network Service Provider* must maintain the primary and back-up communications facilities referred to in clause 4.11.2(a) that were in place at 13 December 1998 so as to achieve substantially the same

performance and functionality as they did over the 12 months prior to 13 December 1998.

4.11.3 Power system voice/data operational communication facilities

(a) *Network Service Providers*, *System Operators*, *Distribution System Operators*, *Generators* and *Market Participants* must advise *NEMMCO* of each nominated person for the purposes of giving or receiving *operational communications* in relation to each of its *facilities*. The persons so nominated must be those responsible for undertaking the operation of the relevant equipment of the relevant *Registered Participant*.

(b) Contact personnel details which must be forwarded to *NEMMCO* include:

(1) title of contact personnel;

(2) the telephone numbers of those personnel;

(3) the telephone numbers of other available communication systems in relation to the relevant *facility*;

(4) a facsimile number for the relevant *facility*; and

(5) an electronic mail address for the relevant *facility*.

(c) Each *Registered Participant* must provide, for each nominated person, two independent telephone communication systems fully compatible with the equipment installed at the appropriate *control centre* nominated by *NEMMCO*.

(d) Each *Registered Participant* must maintain both telephone communication systems in good repair and must investigate faults within 4 hours, or as otherwise agreed with *NEMMCO*, of a fault being identified and must repair or procure the repair of faults promptly.

(e) Each *Registered Participant* must establish and maintain a form of electronic mail facility as approved by *NEMMCO* for communication purposes (such approval may not be unreasonably withheld).

(f) *NEMMCO* must advise all *Registered Participants* of nominated persons for the purposes of giving or receiving *operational communications*.

(g) Contact personnel details to be provided by *NEMMCO* include title, telephone numbers, a facsimile number and an electronic mail address for the contact person.

4.11.4 Records of power system operational communication

(a) *NEMMCO* and the *System Operators* must record each telephone *operational communication* in the form of log book entries or by another auditable method which provides a permanent record as soon as practicable after making or receiving the *operational communication*.

(b) Records of *operational communications* must include the time and content of each communication and must identify the parties to each communication.

(c) Voice recordings of telephone *operational communications* may be undertaken by *NEMMCO* and the *System Operators*. *NEMMCO* and the *System Operators* must ensure that, when a telephone conversation is being recorded under this clause, the persons having the conversation receive an audible indication that the conversation is being recorded. Voice recordings may be used as an alternative to written logs.

(d) *NEMMCO* and the *System Operators* must retain all *operational communications* records including voice recordings for a minimum of 7 years.

(e) In the event of a dispute involving an *operational communication*, the records of that *operational communication* maintained by, or on behalf of, *NEMMCO* will constitute prima facie evidence of the contents of the *operational communication*.

(f) Any recordings made in accordance with this clause 4.11.4 must be made in accordance with the provisions of all applicable privacy laws.

4.11.5 Agent communications

(a) A *Registered Participant* may appoint an agent (called a "*Registered Participant Agent*") to co-ordinate operations of one or more of its *facilities* on its behalf, but only with the prior written consent of *NEMMCO*.

(b) A *Registered Participant* which has appointed a *Registered Participant Agent* may replace that *Registered Participant Agent* but only with the prior written consent of *NEMMCO*.

(c) *NEMMCO* may only withhold its consent to the appointment of a *Registered Participant Agent* under clause 4.11.5(a) or (b) if it reasonably believes that the relevant person is not suitably qualified or experienced to operate the relevant *facility*.

(d) For the purposes of the *Rules*, acts or omissions of a *Registered Participant Agent* are deemed to be acts or omissions of the relevant *Registered Participant*.

(e) *NEMMCO* and its representatives (including authorised agents) may:

(1) rely upon any communications given by a *Registered Participant Agent* as being given by the relevant *Registered Participant*; and

(2) rely upon any communications given to a *Registered Participant Agent* as having been given to the relevant *Registered Participant*.

(f) *NEMMCO* and the *System Operators* are not required to consider whether any instruction has been given to a *Registered Participant Agent* by the relevant *Registered Participant* or the terms of those instructions.

4.12 Nomenclature Standards

(a) A *Network Service Provider* must use the *nomenclature standards* for *transmission* equipment and apparatus as agreed with *NEMMCO* or, failing agreement, as determined by *NEMMCO*.

(b) A *Registered Participant* must use reasonable endeavours to ensure that its *representatives* comply with the *nomenclature standards* in any *operational communications* with *NEMMCO*.

(c) A *Registered Participant* must ensure that nameplates on its equipment relevant to operations at any point within the *power system* conform to the requirements set out in the *nomenclature standards*.

(d) A *Registered Participant* must use reasonable endeavours to ensure that nameplates on its equipment relevant to operations at any point within the *power system* are maintained to ensure easy and accurate identification of equipment.

(e) A *Registered Participant* must ensure that technical drawings and documentation provided to *NEMMCO* comply with the *nomenclature standards*.

(f) *NEMMCO* may, by notice in writing, request a *Registered Participant* to change the existing numbering or nomenclature of *transmission* equipment and apparatus of the *Registered Participant* for purposes of uniformity, and the *Registered Participant* must comply with such a request provided that if the existing numbering or nomenclature conforms with the *nomenclature standards*, *NEMMCO* must pay all reasonable costs incurred in complying with the request.

4.13 Submission of Performance Standards

(a) A *Generator*, *Customer* or *Market Network Service Provider* who, at the date that Tasmania becomes a *participating jurisdiction*, engages in the

activity of owning, operating or controlling a *facility* located in Tasmania must, within 30 *days* of the date that Tasmania becomes a *participating jurisdiction*, submit to *NEMMCO* proposed *performance standards* for that *plant*, such *performance standards* to be:

(1) in the case of a person who is registered as a *Generator* in relation to that *plant* – in accordance with schedule 5.2;

(2) in the case of a person who is registered as a *Customer* in relation to that *plant* – in accordance with schedule 5.3; or

(3) in the case of a person who is registered as a *Market Network Service Provide*r in relation to that *plant* – in accordance with schedule 5.3a.

(b) A *Network Service Provider* who plans, owns, operates or controls a *facility* that is connected to a *facility* planned, owned, controlled or operated by a *Generator*, *Customer* or *Market Network Service Provider* must provide that *Generator*, *Customer* or *Market Network Service Provider* with all performance data and other information, other than *confidential information*, reasonably required by the *Generator*, *Customer* or *Market Network Service Provider* to enable the *Generator*, *Customer* or *Market Network Service Provider* to satisfy its obligations under clause 4.13(a).

4.14 Acceptance of Performance Standards

(a) *NEMMCO* must, following receipt of a proposed set of *performance standards* in accordance with clauses 4.13(a) or 4.14(g), assess whether, in its reasonable opinion, each proposed *performance standard* satisfies the criteria set out in clause 4.14(b).

(b) Subject to clause 4.14(c), for the purposes of clause 4.14(a), the *performance standards* must comply with:

(1) the performance criteria set out in schedules 5.1, 5.2, 5.3 and 5.3a;

(2) any *derogation* applicable to the *plant* to which the *performance standards* apply;

(3) the *connection agreement* applicable to the *plant* to which the *performance standards* apply; and

(4) the design performance of the *plant* at the *performance standards commencement date*.

(c) To the extent of any inconsistency between:

(1) a *performance standard* determined in accordance with a *derogation* and a *performance standard* determined in accordance with:

(i) the performance criteria set out in schedules 5.1, 5.2, 5.3 and 5.3a;

(ii) the *connection agreement* applicable to the *plant* to which the *performance standard* applies; or

(iii) the design performance of the *plant* at the *performance standards commencement date*,

the *performance standard* determined in accordance with the *derogation* will prevail;

(2) a *performance standard* determined in accordance with an existing *connection agreement* and a *performance standard* determined in accordance with:

(i) the performance criteria set out in schedules 5.1, 5.2, 5.3 and 5.3a; or

(ii) the design performance of the *plant* at the *performance standards commencement date*,

the *performance standard* determined in accordance with the *connection agreement* will prevail; and

(3) a *performance standard* determined in accordance with the design performance of the *plant* at the *performance standards commencement date* and a *performance standard* determined in accordance with the performance criteria set out in schedules 5.1, 5.2, 5.3 and 5.3a, the *performance standard* determined in accordance with the design performance of the *plant* will prevail.

(d) *NEMMCO* must:

(1) if it assesses that a proposed *performance standard* meets the criteria set out in clause 4.14(b), accept the proposed *performance standard*; or

(2) if it assesses that a proposed *performance standard* does not meet the criteria set out clause 4.14(b), reject the proposed *performance standard*.

(e) *NEMMCO* must advise the person who submitted a proposed *performance standard*, in accordance with clause 4.13(a) or 4.14(g), of its decision to accept or reject the proposed *performance standard*, in accordance with clause 4.14(d), within 60 *business days* of submission of the proposed *performance standard* to *NEMMCO* in accordance with clause 4.13(a) or 4.14(g).

(f) If *NEMMCO* rejects a proposed *performance standard*, in accordance with clause 4.14(d)(2), *NEMMCO* must, when advising the person in accordance clause 4.14(e), also provide the person with detailed reasons for its decision to reject the proposed *performance standard*.

(g) If *NEMMCO* rejects a proposed *performance standard* in accordance with clause 4.14(d)(2), the person who submitted the proposed *performance standard* to *NEMMCO* must, within 20 *business days* of the date upon which *NEMMCO* made its decision to reject the proposed *performance standard*, resubmit an amended proposed *performance standard* in accordance with clause 4.13(a), taking *NEMMCO's* comments into consideration.

(h) If, 11 months from the date that a person is required, in accordance with clause 4.13(a), to submit a proposed *performance standard*, a *performance standard* has not been approved in accordance with clause 4.14(d)(1), the *performance standard* for the *plant* to which the proposed *performance standard* related is deemed to be (in order of priority):

(1) the technical characteristics set out in the relevant *connection agreement*;

(2) if a *derogation* is in place, the *connection agreement* subject to the technical characteristics set out in the relevant *derogation*; or

(3) the *connection* requirements of the *connection point* determined in accordance with clause 5.3.3.

(i) For the purposes of this clause 4.14, *NEMMCO* must accept a *performance standard* proposed by a *Registered Participant* materially based upon and consistent with a *derogation* applicable to the plant to which the *performance standard* applies.

(j) *NEMMCO* may request that a *Registered Participant*, who has submitted a proposed *performance standard* in accordance with clauses 4.13(a) or 4.14(g), provide additional supporting information reasonably required by *NEMMCO* to facilitate its assessment of the *performance standard* submitted.

(k) A *Registered Participant* who receives a request from *NEMMCO*, in accordance with clause 4.14(j), must comply with the request within 5 *business days*.

(l) A *Registered Participant* whose proposed *performance standard* is rejected in accordance with clause 4.14(d)(2) may dispute the decision by *NEMMCO* to reject the proposed *performance standard*.

(m) If a dispute arising under clause 4.14(l) is not resolved in accordance with clause 8.2.4 within 60 *business days* then, notwithstanding any other provision in clause 8.2, the *Adviser* must refer the dispute to a *DRP* for determination in accordance with clauses 8.2.6A to 8.2.6D.

(n) *NEMMCO* must establish and maintain a register of the *performance standards* applicable to *plant* as advised by *Registered Participants* in accordance with clause 5.3.7(e)(1) or established in accordance with clause 4.14.

(o) *NEMMCO* or, in respect of a matter concerning the quality of *supply* to *Network Users*, *NEMMCO* in consultation with the relevant *Network Service Provider*, must, when determining the applicable *performance standard* for a particular requirement based on any provision of schedules 5.1, 5.2, 5.3 and 5.3a, require a *Registered Participant* to meet or exceed the *minimum access standard* but must not require the *Registered Participant* to exceed the relevant *automatic access standard* for that requirement.

4.15 Performance Standard Compliance

(a) A *Registered Participant* must:

(1) ensure that its *plant* meets or exceeds the *performance standard* applicable to its *plant*;

(2) ensure that its *plant* is not likely to cause a material adverse effect on *power system security*; and

(3) immediately ensure that its *plant* ceases to be likely to cause a material adverse effect on *power system security*, if:

(i) the *Registered Participant* reasonably believes that its *plant* is likely to cause a material adverse effect on *power system security*; or

(ii) *NEMMCO* advises the *Registered Participant* that the *Registered Participant's plant* is likely to cause a material adverse effect on *power system security*.

(b) A *Registered Participant* who engages in the activity of planning, owning, controlling or operating *plant* to which a *performance standard* applies must, within 6 months of the later of the date of the establishment of the *performance standard* in accordance with clause 4.14 or clause 5.3.4A(g) (as the case may be) or the commencement of operation of the *plant*, institute and maintain a compliance program, in accordance with clause 4.15(c).

(c) A compliance program instituted and maintained in accordance with clause 4.15(b) must:

(1) monitor the performance of the *plant* in accordance with the provisions of the compliance program;

(2) ensure that the *plant* complies with the relevant *performance standards*;

(3) be in accordance with *good electricity industry practice*; and

(4) provide reasonable assurance of ongoing compliance with each applicable *performance standard*.

(d) The *AER* may request that a *Registered Participant*, who is required to institute and maintain a compliance program in accordance with clause 4.15(b) or clause 5.7.4(a1), deliver to the *AER*:

(1) the compliance program records setting out the written results of the performance monitoring conducted in accordance with clause 4.15(f) or clause 5.7.4(a2)(1); and

(2) any other records maintained in accordance with clause 5.7.3 or clause 5.7.4, if applicable.

(e) Each *Registered Participant* must maintain the compliance program records and any other records developed or maintained under clause 5.7.3 or clause 5.7.4 for 7 years and deliver such records to the *AER*, in accordance with clause 4.15(d), within 2 *business days* of the date of the request or such further period as the *AER* requires.

(f) A *Registered Participant* who engages in the activity of planning, owning, controlling or operating *plant* to which a *performance standard* applies must immediately notify *NEMMCO* if:

(1) the *Registered Participant* becomes aware that the *plant* is breaching a *performance standard* applicable to the *plant*; or

(2) the *Registered Participant* reasonably believes that the *plant* is likely to breach a *performance standard* applicable to the *plant.*

(g) A notice in accordance with clause 4.15(f) must detail:

(1) the reason for the actual or likely non-conformance of the *plant* with the *performance standard*;

(2) the actual or likely time of commencement of non-conformance of the *plant* with the *performance standard*;

(3) the expected duration of non-conformance of the *plant* with the *performance standard*; and

(4) the expected performance of the *plant* in comparison with the *performance standard*.

(h) A *Registered Participant* who has notified *NEMMCO*, in accordance with clause 4.15(f), must notify *NEMMCO* that its *plant* has returned to compliance with the *performance standard* immediately following the return of the *plant* to compliance.

(i) If:

(1) a *Registered Participant* notifies *NEMMCO* in accordance with clause 4.15(f); or

(2) *NEMMCO* otherwise reasonably believes that the *plant* of a *Registered Participant*, in respect of which a *performance standard* applies, is in breach of that *performance standard*,

NEMMCO must, in accordance with clause 4.15(j), advise the *Registered Participant* of the period within which the *Registered Participant* must rectify the breach.

(j) *NEMMCO* must, when determining the period within which a *Registered Participant* may rectify a *performance standard* breach in accordance with clause 4.15(i), take into consideration:

(1) the time necessary, in *NEMMCO's* reasonable opinion, to provide the *Registered Participant* with the opportunity to remedy the breach; and

(2) the need to act to remedy the breach given the nature of the breach.

(k) If the *plant* of a *Registered Participant* remains in breach of a *performance standard* for a period greater than that determined in accordance with clause 4.15(i), *NEMMCO* must notify the *AER* of the breach.

(l) The effectiveness of a compliance regime established in accordance with clause 4.15(b) must be taken into consideration in any proceeding against a *Registered Participant* for a breach of clause 4.15(a).

(m) Any obligation imposed on a *Generator* in accordance with clause 5.7.3(c) ceases to operate upon the commencement of a compliance program by the *Generator* in accordance with clause 4.15(b).