
REVIEW OF ELECTRICITY SYSTEM PLANNING, MONITORING AND REPORTING

ISSUES PAPER

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To facilitate publication on the Commission's website, submissions should be made electronically by disk or email. However, if this is not possible, submissions can be made in writing.

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CHAPTER 1

Overview

Introduction

- 1.1 The Utilities Commission has terms of reference from the Treasurer to review and report on the adequacy of current electricity industry performance monitoring and reporting arrangements under the *Electricity Reform Act*.
- 1.2 The objective of the review is to identify options to ensure that electricity industry planning, monitoring and reporting arrangements promote acceptable performance outcomes.

Planning, monitoring and reporting

- 1.3 Planning, monitoring and reporting involve a range of functions and activities undertaken by electricity suppliers, industry regulators and governments to ensure that power system (comprising electricity generation and transmission networks) and distribution network security and reliability outcomes are in the long term interests of customers.

Purpose of planning, monitoring and reporting

- 1.4 A safe, reliable, secure and cost effective electricity supply requires the management and coordination of power system and distribution network assets. Good asset management requires that electricity suppliers have the capability to invest in the right assets at the right time, exploit them appropriately, maintain them and ultimately replace or dispose of them.
- 1.5 In the electricity industry, asset management involves a series of decisions about the selection, design/acquisition, operation, maintenance and renewal/disposal of assets along the electricity supply chain, such as generators, transmission lines, substations, switching equipment and distribution feeders.
- 1.6 The activities of planning, monitoring and reporting play a crucial role in ensuring good asset management and investment decisions that result in a reliable electricity supply at the lowest cost, over the long term:
 - planning involves an independent, forward looking comparison of the capacity of the power system and distribution network in the medium (the next two to three years) and long term (up to 20 years) with the forecast future demand. This identifies potential infrastructure investment opportunities that may be acted on by existing or prospective service providers. An independent and expert assessment of future infrastructure should support the coordination of the management of existing assets with new investment;
 - monitoring involves obtaining performance data, and assessing the performance of the power system and distribution network against reliability and security standards, and regulatory obligations, to confirm that electricity assets can and will

perform as expected. This assists in holding a service provider accountable for achieving the expected performance outcomes; and

- reporting involves the regular release of comprehensive, consistent and reliable information on current and forecast infrastructure capability, and on the conduct and outcomes of planning processes and investment in the power system and distribution network. Reporting informs the decisions making processes of current and prospective service providers.

Northern Territory experience

- 1.7 The allocation of responsibility for planning, monitoring and reporting activities in the Territory is based on arrangements in place in the national electricity market (NEM) jurisdictions in the late 1990s. However, regulatory arrangements in the NEM are dynamic, and have changed substantially in response to experience, but the Territory's framework is little changed.
- 1.8 In September and October 2008 there were lengthy power outages in Darwin's northern suburbs as a result of equipment failure at the Casuarina zone substation. About 15 000 customers were affected, many more than once, with the most significant outage causing more than 11 000 customers to lose power for up to 14 hours. In response, the Territory Government commissioned the Independent Enquiry into Casuarina Substation Events and Substation Maintenance Across Darwin (the Davies Enquiry), which exposed deficiencies in maintenance practices and asset management by PWC Networks.
- 1.9 The Davies Enquiry found that PWC Networks had a generally poor understanding of asset condition and performance. Further problems for future reliability of supply outcomes were reported in the PWC 2010-11 Statement of Corporate Intent, including that the Territory's electricity systems are under significant and increasing pressure, and that urgent refurbishment or replacement of key assets is needed to mitigate the risk of major equipment failure and major power outages.
- 1.10 The Davies Enquiry findings and the identification in early 2010 of concerns about the capability of generation assets highlighted PWC's poor asset management capability. The nature and scale of the Casuarina zone substation failures and generation related problems are such that good asset management would probably have identified the potential risks to security and reliability of supply.
- 1.11 The Commission and System Control have been working since 2009-10 to establish more effective arrangements for understanding of the condition and future adequacy of electricity infrastructure.
- 1.12 Notwithstanding these efforts, the Commission is of the view that the Territory does not yet have a comprehensive, transparent and coordinated set of system planning, monitoring and reporting arrangements. The implication is that investment and operational outcomes are not optimal, potentially causing the cost of electricity services to be higher and reliability to be worse.

Planning – functions and activities

- 1.13 Planning activities guide the decisions of individual companies (generators, transmission network service providers – TNSPs, and distribution network service providers – DNSPs) about managing and developing infrastructure so as to deliver a

safe supply of electricity that meets customer expectations for reliability, security and quality, at the lowest long term cost.

- 1.14 Individual companies will respond differently to the outcomes of the planning process, based on their commercial priorities, internal management processes and regulatory obligations, which differ for each part of the electricity supply chain, between jurisdictions and between companies.
- 1.15 The key external factors influencing the decision making processes and the resulting investment decisions of individual companies are:
- reliability and security criteria, and equipment technical requirements that establish the performance standards for the power system and distribution network;
 - regulation of the planning process or the planning options that might be considered by a generator or network service provider company;
 - involvement of the regulator in assessing the efficiency of proposed investment, or of the system operator as a supplier of last resort, to ensure adequate generation or network capacity at the lowest long term cost; and
 - government policy that mandates a specific investment outcome.
- 1.16 The Commission is seeking comment about whether:
- the reliability and security standards established by the Territory's regulatory framework can be made more explicit so as to effectively support appropriate investment and performance outcomes;
 - the reliance on PWC Generation, as the only market participant, to invest in new generation capacity warrants development of a last resort provider mechanism to provide certainty that investment in generation capacity will be adequate to maintain reliability of supply; and
 - further or alternative arrangements are required to assist in achieving efficient and effective distribution network investment outcomes that ensure capacity will be adequate to maintain reliability of supply, on a cost effective basis.

Monitoring – functions and activities

- 1.17 Monitoring by service providers, system operator and regulators of the adequacy of the power system and distribution network to perform as expected in the medium to long term should highlight deficiencies in operating practices and ageing or deteriorating assets that might have an adverse effect on reliability or security of supply.
- 1.18 Monitoring involves obtaining performance data and assessing the performance of electricity assets through:
- assessing if a service provider is operating their assets according to the requirements of the regulatory framework, including relevant technical and design parameters;
 - investigation of power system incidents where equipment failure, natural events or operator error causes the significant deviation from normal operating conditions; and
 - measuring the overall performance of the power system and distribution network infrastructure against reliability and quality of supply standards.

1.19 The Commission is seeking comment about whether:

- the Commission's view that the practices of the Australian Energy Regulator for monitoring compliance with behavioural and technical obligations should guide the development of compliance monitoring arrangements and practice in the Territory;
- the existing regulatory arrangements and approach to monitoring equipment capability and performance promote confidence that the capability of electricity infrastructure is well understood and that assets will perform as expected;
- more comprehensive incident reporting arrangements that provide clear guidance about when and how an incident should be investigated are important for effective monitoring of electricity industry performance; and
- routine and comprehensive monitoring of system and distribution network performance is important to provide critical information about system security and reliability trends.

Reporting – functions and activities

1.20 The purpose of reporting is to inform industry participants, prospective participants, customers, regulators and policy makers about power system and distribution network management and development, to inform operating and investment decisions, facilitate coordination of investment and to provide confidence that generation and network capacity is sufficient to maintain security and reliability of supply over time. Reporting plays an important role in holding service providers accountable for performance outcomes.

1.21 Reporting is targeted at addressing particular areas of concern in the electricity supply chain by informing the energy industry and potential investors (and also policy makers and the community) about:

- the adequacy of capacity relative to forecast demand to provide confidence that generation and network capacity is sufficient to maintain security and reliability of supply over time;
- the performance and health of the power system and components to provide information about system performance trends, regulatory and technical compliance (including equipment capability relative to security standards), and the findings of investigations into power system incidents; and
- system development, to inform operating and investment decisions and facilitate coordination of investment.

1.22 The focus and detail of reporting can vary for each electricity industry sector, individual electricity networks and jurisdictions. These differences primarily reflect a regulatory response to local supply conditions, such as weather, influences on demand growth and the design of the system or network.

1.23 The Commission is seeking comment about whether:

- routine and comprehensive reporting of historical and forward looking information about the power system and distribution network is necessary to support effective planning and operation decisions, and timely and cost effective investment outcomes;
- routine and comprehensive reporting on system adequacy, consistent with the approach adopted in the NEM by the Australian Energy Market Operator, should be adopted in the Territory;

- adopting more comprehensive and specific network reporting requirements would be beneficial by establishing an effective and flexible reporting framework that provides investors, customers and the Commission with a comprehensive understanding of network adequacy;
- that assessing the adequacy of the source and supply of fuel for electricity generation in the Territory is warranted, given the importance of fuel availability to a reliable and secure electricity supply;
- reporting on performance and health, including the outcomes of investigations of compliance with technical performance standards would encourage and support the efforts of PWC Networks, generators and System Control to operate electricity infrastructure according to the standards required by relevant reliability and security criteria; and
- reporting should facilitate the development and the coordination of planning activities throughout the electricity supply chain. This would involve reporting the key information necessary for investors to make informed and timely investment decisions.

Conduct of review and request for submissions

1.24 The Commission is seeking submissions from interested parties providing detailed comments about the issues raised in this Issues Paper, and any other matters they consider relevant to the terms of reference.

1.25 A draft Report will be released in March 2011. The final Report will be provided to the Treasurer in June 2011.

1.26 The timetable for the review is:

Date	Action
3 December 2010	Release of Issues Paper
14 January 2011	Submissions on Issues Paper
March 2011	Release of Draft Report
April 2011	Submissions on Draft Report
June 2011	Final Report submitted to the Treasurer

CHAPTER 2

Introduction

Background

- 2.1 The electricity supply industry in the Northern Territory is regulated through the *Electricity Reform Act*, *Electricity Networks (Third Party Access) Act*, *Utilities Commission Act* and associated legislation. This regulatory framework was introduced on 1 April 2000.
- 2.2 The regulatory framework is primarily focused on regulating the activities of electricity industry participants and customers in the Darwin-Katherine, Alice Springs and Tennant Creek power systems – referred to as the market systems. Key elements of the framework are:
- third party access to the Darwin-Katherine, Alice Springs and Tennant Creek electricity networks;
 - staged introduction of retail contestability. All customers became contestable from 1 April 2010; and
 - an independent economic regulator, the Utilities Commission, to regulate monopoly electricity services, licence market participants and enforce regulatory standards for market conduct and service performance.
- 2.3 The Power and Water Corporation (PWC) is the main electricity service provider in the market systems, generating the majority of electricity used, operating the electricity networks and supplying retail services. PWC is also the main electricity service provider in regional and remote parts of the Territory, and is the water and sewerage service provider throughout the Territory.
- 2.4 PWC is a vertically integrated, Territory Government owned corporation, with generation, network and retail business units operating as separate businesses.¹ The commercial relationship and transactions between each unit is subject to oversight and regulation by the Commission.² PWC is also subject to oversight by a shareholding Minister (currently the Treasurer) through the *Government Owned Corporations Act*.
- 2.5 In the three market systems, PWC is currently the sole electricity retailer, supplying electricity to about 74 000 customers at 30 June 2010.³ PWC is also the main electricity generator, with almost 91 per cent of generation capacity. There are four other companies generating electricity for the Darwin-Katherine and Alice Springs systems.

¹ This paper refers to the separate business units as PWC Retail, PWC Networks and PWC Generation.

² Regulatory instruments include the licensing framework and the Northern Territory Electricity Ring-Fencing Code.

³ Power and Water Corporation, 2009-10 Electricity Retail Licence Return.

However, these businesses generate electricity under contract for PWC rather than selling directly to an electricity retailer or to customers, and PWC provides the fuel used for electricity generation.⁴

- 2.6 PWC Networks operates the Darwin-Katherine, Alice Springs and Tennant Creek electricity networks, which comprise 666 kilometres (km) of transmission lines and 5156 km of distribution lines.⁵
- 2.7 The System Control function is a part of PWC Networks. The System Controller has statutory responsibilities for monitoring and controlling the operation of the power system to ensure the system operates reliably, safely and securely in accordance with the System Control Technical Code.
- 2.8 Electricity supply in regional and remote centres of the Territory is managed through a contract for service model, supply arrangements agreed between the service purchaser (most often the Territory Government) and a service provider (in most cases, PWC or a PWC subsidiary). These systems include the 72 communities and 82 outstations where essential services are provided through the Territory Government Indigenous Essential Services program; three mining townships, where electricity is supplied by the associated mining company; and eight remote townships.⁶

Planning, monitoring and reporting

- 2.9 Planning, monitoring and reporting involve a range of functions and activities undertaken by electricity suppliers, industry regulators and governments to ensure that security and reliability of supply outcomes are in the long term interests of customers.
- 2.10 It is important to note that the approach to planning, monitoring and reporting can differ for generation and transmission networks, and for distribution networks. In the Territory, the power system is the generation, transmission and distribution networks elements of the electricity supply chain. However, in the national electricity market (NEM), the power system is the generation and transmission network elements of the electricity supply chain, with distribution networks dealt with separately.⁷
- 2.11 This paper distinguishes between the power system (generation and transmission networks) and distribution networks when discussing planning, monitoring and reporting arrangements.

Purpose of planning, monitoring and reporting

- 2.12 A safe, reliable, secure and cost effective electricity supply requires the management and coordination of power system and distribution network assets. Good asset management requires that the service provider have the capability to invest in the right

⁴ These generators are located at Pine Creek (between Darwin and Katherine), Shoal Bay (at the Darwin City Council dump) and Brewer Estate (in Alice Springs).

⁵ Power and Water Corporation, 2009-10 Retail Licence Return.

⁶ The three mining townships are Nhulunbuy, Alyangula and Jabiru. The eight remote townships are Timber Creek, Borroloola, Daly Waters, Elliot, Newcastle Waters, Kings Canyon, Yulara and Ti-Tree.

⁷ *Electricity Reform Act*, s4 and National Electricity Rules, Chapter 10, definition of power system.

assets at the right time, exploit them appropriately, maintain them and ultimately replace or dispose of them.

- 2.13 In the electricity industry, asset management involves a series of decisions about the selection, design/acquisition, operation, maintenance and renewal/disposal of assets along the electricity supply chain, such as generators, transmission lines, substations, switching equipment and distribution feeders.
- 2.14 The activities of planning, monitoring and reporting play a crucial role in ensuring good asset management and investment decisions that result in a reliable and secure electricity supply at the lowest cost.
- 2.15 Security of supply is when the power system and distribution network are able to maintain the electricity supply to customers despite an equipment failure or similar fault along the supply chain. Achieving security of supply involves the coordination of a range of actions along the electricity supply chain:
- system operation. This requires that system dispatch, operating procedures and staff training reflect good industry practice;
 - generators conforming to defined technical standards. This requires that maintenance and testing practices and staff training reflect good industry practice;
 - security of fuel supply. This requires generators obtaining a secure fuel supply. In a small isolated system like those in the Territory, this assumes greater importance than in larger and more diverse systems elsewhere in Australia; and
 - network design and maintenance conforming to defined technical standards. This requires appropriate testing, protection and network control schemes.
- 2.16 A reliable power system means that the power system is able to routinely deliver sufficient electricity to meet customer demand, so that customers do not go without power, except for power outages resulting from planned maintenance or events that are beyond the reasonable control of the service provider. Achieving a reliable power system involves the coordination of a range of actions along the electricity supply chain:
- overall planning and design including demand forecasting. This requires an overarching view of system development to effectively coordinate augmentation, expansion and maintenance;
 - system control manages capacity reserves. This requires the system controller to identify and manage capacity shortfalls when they exist;
 - adequacy of generation capacity and reliability of generators. This requires that generators have adequate capacity available to meet peak demand conditions, through providing new capacity and ensuring availability of existing capacity (e.g. coordination of maintenance and holding strategic spares);
 - reliability of fuel supply. This requires that generators obtain adequate fuel capacity and volumes to meet peak demand conditions; and
 - network capacity, redundancy and performance of the network being adequate to meet peak demand conditions. This requires the network service provider to provide new capacity and ensure the availability of existing capacity (including by adopting appropriate testing and maintenance practices).

Planning

- 2.17 System and distribution network planning involves looking forward to the medium (the next two or three years) and long term (up to 20 years) to compare the capacity of the

power system and distribution network with the forecast future demand, and to assist identification of potential infrastructure investment opportunities. This requires a good understanding of customer demand and, in particular, the location, time profile and growth rate of future demand. Planning should integrate with the management of existing assets.

- 2.18 Planning activities guide the decisions of individual companies (generators, transmission network service providers – TNSPs and distribution network service providers – DNSPs) about managing and developing infrastructure so as to deliver a safe supply of electricity that meets customer expectations of reliability, security and quality at the lowest long term cost. Planning activities should support the identification of the most economic future options for augmentation and expansion of infrastructure to meet expected customer demand, and the management and coordination of the preferred investment actions to ensure new generation, transmission and distribution capacity is available to maintain reliability and security standards, on a cost effective basis.
- 2.19 Individual companies will respond differently to system and distribution network planning, based on commercial priorities, internal management processes and regulatory obligations, which differ for each part of the electricity supply chain, between jurisdictions and between companies. A requirement of effective decision making is that companies develop a comprehensive understanding of the current power system performance and asset condition and its projected future performance using modelling practices and tools for analysing power systems to identify investment options.
- 2.20 The key external factors influencing the decision making processes and the resulting investment decisions of individual companies are:
- reliability and security criteria, and equipment technical requirements defined by governments, regulators or system operators to establish the performance standards for the power system and distribution network;
 - regulation of the planning process or the planning options considered by a company to ensure that each investment decision is the most economic way of managing and developing the system in the long term interests of customers. The planning decisions and processes of TNSPs and DNSPs in Australia are subject to oversight by an economic regulator through the five yearly network price regulation process;
 - involvement of the economic regulator or system operator as a supplier of last resort to ensure adequate (generation or network) capacity. For example, the Australian Energy Market Operator (AEMO) may contract for reserves if a generation capacity shortfall is forecast and there is no response evident by the market.⁸ Also, the Australian Energy Market Commission (AEMC) is responsible for a last resort planning power to ensure timely and efficient inter-regional transmission investment;⁹ and

⁸ National Electricity Rule 3.20.3(b). AEMO may determine to enter into *reserve contracts* to ensure that the reliability of *supply* in a *region* or *regions* meets the relevant *power system security and reliability standards* established by the *Reliability Panel* for the *region* and, where practicable, to maintain *power system security*.

⁹ National Electricity Rule 5.6.4 gives the AEMC a last resort planning power for inter-regional transmission investment.

- government policy that mandates a specific investment, such as the Council of Australian Governments' decision to mandate a national roll out of smart meters, where the benefits outweigh the costs.¹⁰

Monitoring

- 2.21 Planning and developing the power system and distribution network with the appropriate capacity is a necessary precursor to delivering reliable supply. The power system and distribution network must also be maintained and operated within appropriate performance standards to achieve the outcomes required.
- 2.22 Monitoring involves obtaining performance data and assessing the performance of the power system and distribution network against reliability and security standards to confirm that electricity assets can and will perform as expected. This assists in holding the service provider accountable for achieving the expected performance outcomes.
- 2.23 As noted by System Control in an October 2009 review of the System Control Technical Code:¹¹

Compliance with Technical Standards and Codes is crucial to ensuring power system security, and ensures safe and reliable operation of a power system within the technical envelope of all the components. When this is not the case, the risk of major power system incidents will substantially increase.

Absence of reliable detail about operating capability of power system equipment has a similar effect, resulting in increased risk of power system incidents and increased conservatism by the Power System Controller in order to achieve safe and secure operation of the power system. This in turn reflects directly upon the efficiency of the power system.

- 2.24 Monitoring the adequacy of the power system and distribution network to perform as expected in the medium to long term should highlight deficiencies in operating practices or ageing or deteriorating assets that might have an adverse affect on reliability or security of supply. Good industry practice for assessing system health includes:
- assessing operating practices and testing equipment to ensure they comply with relevant technical and design parameters. For example, PWC System Control can require generators to test and demonstrate the performance capabilities of their equipment.¹² The Queensland regulator reviews the annual network management

¹⁰ Council of Australian Governments, Communiqué, April 2007. COAG mandated a staged approach for the national roll out of electricity smart meters to areas where benefits outweigh costs. The Ministerial Council on Energy, Smart Meter Decision Paper, 13 June 2008, set out the approach for implementing the roll out of electricity smart meters.

¹¹ PWC System Control, System Control Technical Code Review, 14 October 2009, page 4. System Control is required to develop a system control technical code by the Electricity Networks (Third Party Access) Code cl.27A. The System Control Technical Code is developed by System Control and approved by the Commission. The current version (3) has been in place since May 2010. A copy is available from, http://www.nt.gov.au/ntt/utilicom/electricity/technical_regulation.shtml.

¹² System Control Technical Code, version 3, May 2010, s6.24.

plans produced by DNSPs, including compliance with planning and asset management policies;¹³

- establishing clear processes for responding to power system incidents where equipment failure, natural events or operator error cause a significant deviation from normal operating conditions. AEMO is required to review and report on operating incidents 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;¹⁴ and
- measuring the overall performance of the power system and distribution network infrastructure against reliability and quality of supply standards – e.g. measuring the duration and frequency of power outages.

Reporting

2.25 Reporting involves regularly providing comprehensive, consistent and reliable information to industry participants, prospective participants, customers, regulators and policy makers on current and forecast infrastructure capability, and on the conduct and outcomes of planning processes and investment in the power system and distribution network.

2.26 The purpose of reporting is to inform stakeholders about power system and distribution network management and development, to inform operating and investment decisions, facilitate coordination of investment (e.g. a generation investment may require coordination with transmission investment) and to provide confidence that generation and network capacity is sufficient to maintain security and reliability of supply over time.

2.27 As importantly, reporting on performance against the relevant security and reliability criteria assists in holding the service provider accountable for their investment and operating decisions, and the resulting performance outcomes.

2.28 Reporting can be:

- forward looking, involving planning data providing forecasts and views of future needs; and
- reviewing past performance or incidents to guide ongoing improvements.

2.29 In the Territory, the Commission reports on past performance and forward looking system adequacy through the annual Power System Review. The Power System Review is an evolving project, with the Commission noting in the 2008-09 Review that:¹⁵

Regular and comprehensive public reporting on power system performance is a feature of the electricity supply industry elsewhere in Australia... The Commission considers that collating and analysing all data relevant to system capacity and performance in a single document will assist participants in the electricity supply industry, and the community, make an informed view about the performance and prospective trends for

¹³ Queensland Electricity Industry Code, s2.3.

¹⁴ National Electricity Rules 4.8.15.

¹⁵ Utilities Commission, 2008-09 Power System Review, March 2010, page 9.

the Territory's power systems. The expanded scope of the Review should make system reporting in the Territory more consistent with practice elsewhere in Australia.

- 2.30 Additionally, System Control has an obligation to review and report on power system performance and investigations of incidents. The Commission uses this information in its annual Power System Review.
- 2.31 In the NEM, reporting of forward looking information for the power system primarily occurs through AEMO publishing the Power System Adequacy report (giving a two year outlook) and the Electricity Statement of Opportunities report (giving a 20 year outlook). Past performance of the power system is examined by AEMO and the AER (Australian Energy Regulator) including by AEMO reporting on power system incidents and the AER reporting on technical compliance with the National Electricity Rules. The AEMC Reliability Panel produces a key annual report on power system performance in the previous year.
- 2.32 Reporting on distribution network performance is generally required at a jurisdiction level, with DNSPs generally required by state based legislation to prepare annual planning reports. An obligation for DNSPs to prepare annual planning reports is shortly to be introduced in the National Electricity Rules.¹⁶

Northern Territory experience

- 2.33 Responsibility for planning, monitoring and reporting in the Territory is allocated as follows:
- as system operator, System Control is responsible for oversight and management of power system reliability, safety and security. The operating protocols and technical parameters for the power system are set out in the System Control Technical Code and the Network Connection Technical Code;
 - generators are meant to invest in generation capacity on a commercial basis, subject to satisfying planning and environmental approvals (separate to the Territory's electricity industry regulatory framework), and being able to meet the technical design and operating requirements specified in the System Control Technical Code;
 - as DNSP and TNSP, PWC Networks is responsible for managing the development of the electricity network. The technical parameters for the network are set out in the Network Connection Technical Code and Network Planning Criteria;¹⁷
 - the Commission is responsible for monitoring compliance by electricity industry participants with regulatory instruments, including if they meet the technical requirements of the regulatory framework; and
 - the Commission is responsible for reporting on the performance of the electricity system and distribution network, trends in generation and network capacity and reliability and whether supply can reliably meet forecast demand. The Commission

¹⁶ MCE, October 2010, Standing Committee of Officials Bulletin No. 184 MCE Response: AEMC Review of a National Framework for Electricity Distribution Network Planning and Expansion.

¹⁷ PWC Networks is required by the Electricity Networks (Third Party Access) Code, cl.9 to prepare and publish a network technical code and network planning criteria, which are approved by the Commission. The current versions (2) have been in place since April 2003, and are available on the Commission website at http://www.nt.gov.au/ntt/utilicom/electricity/technical_regulation.shtml.

fulfils this function primarily through an annual Power System Review, as required by the *Electricity Reform Act* [s.45].¹⁸

- 2.34 The allocation of responsibility for planning, monitoring and reporting activities in the Territory is based on arrangements in place in the NEM jurisdictions in the late 1990s. However, regulatory arrangements in the NEM are dynamic, and have changed substantially in response to experience, but the Territory's framework is little changed.
- 2.35 In September and October 2008 there were lengthy power outages in Darwin's northern suburbs as a result of equipment failure at the Casuarina zone substation. About 15 000 customers were affected, many more than once, with the most significant outage causing more than 11 000 customers to lose power for up to 14 hours. In response, the Territory Government commissioned the Independent Enquiry into Casuarina Substation Events and Substation Maintenance Across Darwin (the Davies Enquiry), which exposed deficiencies in maintenance practices and asset management by PWC Networks.¹⁹
- 2.36 The Davies Enquiry found that PWC Networks had a generally poor understanding of asset condition and performance. Further problems for future reliability of supply outcomes were recognised in the PWC 2010-11 Statement of Corporate Intent:²⁰
- The electricity...systems are under significant and increasing pressure. Essential work will require greater funding than had been previously planned and approved... to mitigate the risk of major equipment failure through an increase in spending on asset refurbishment and renewal.*
- This increased infrastructure investment is a consequence of past under-investment. Additionally, ongoing investigations have found that the previous estimates of the residual life of many assets may have been optimistic and that additional urgent refurbishment or replacement of key assets is needed.*
- The development of generation capacity is planned to meet projected demand with timing for new plant primarily based on the n-2 criterion, and focuses in particular on power system reliability, fuel supply reliability, plant efficiency and incremental capacity increases. Because of increasing reliability issues with generation assets, a revised Generation capital investment strategy was developed and approved in February 2010.*
- 2.37 The Davies Enquiry findings and identification in early 2010 of concerns about the capability of generation assets highlighted PWC's poor asset management capability. The nature and scale of the Casuarina zone substation failures and generation related problems are such that good asset management (i.e. maintenance, inspection and renewal) would probably have identified the potential risks to security and reliability of supply.

¹⁸ See to the Commission website, http://www.nt.gov.au/ntt/utilicom/electricity/technical_regulation.shtml.

¹⁹ Mervyn Davies, Independent Enquiry into Casuarina Zone Substation Events and Substation Maintenance Across Darwin. Go to the Power and Water Corporation website for the Preliminary and Final reports, http://www.powerwater.com.au/about_us/major_projects/power_supply_update.

²⁰ Power and Water Corporation, 2010-11 Statement of Corporate Intent, page 24.

2.38 The Commission and System Control have been working during 2009-10 to establish more effective arrangements for understanding of the condition and future adequacy of electricity infrastructure. In particular, the Commission:

- expanded the scope of the 2008-09 Power System Review to facilitate an effective assessment of the health of the Territory's power systems and distribution networks. However, the Commission did not have sufficient information to confirm the condition of generation and network assets, the operating capacity of generation plant and the short and longer term capital and maintenance plans. The Power System Review is an evolving project;
- started consultation with System Control on the development of comprehensive incident reporting arrangements to establish a clear process for investigating power system incidents; and
- placed a greater focus on technical compliance, including by requesting that System Control report on procedural compliance with the System Control Technical Code for 2009-10.

2.39 System Control initiated an amendment to the System Control Technical Code in October 2009 to introduce a more comprehensive testing regime to verify the operating capacity of generation equipment against the recorded performance capability information.²¹ A revised System Control Technical Code was approved by the Commission in May 2010.

2.40 Notwithstanding these efforts, the Territory does not yet have a comprehensive, transparent and coordinated set of system planning, monitoring and reporting arrangements. The implication is that investment and operational outcomes are not optimal, potentially causing the cost of electricity services to be higher and reliability to be worse.

Purpose of this review

2.41 The Commission has terms of reference from the Treasurer to review and report on the adequacy of current performance monitoring and reporting arrangements under the *Electricity Reform Act*, and appropriate network and generation reliability standards for performance monitoring.

2.42 The objective of this review is to recommend a course of action that ensures that planning, monitoring and reporting promote acceptable performance outcomes.

Summary of terms of reference and scope of review

2.43 The Commission is to assess the effectiveness of existing planning, monitoring and reporting arrangements for the Territory electricity systems, and identify options for ensuring that planning, monitoring and reporting facilitate system performance that is consistent with applicable service standards. The Commission is to consider:

- the relationship between performance, planning decisions, capital and maintenance programs and applicable standards of service;

²¹ Performance Capability Information is recorded in the Participant specific components of the Secure System Guidelines. The System Control Technical Code [s.6.24] details the requirements for provision/amendment of performance capability information.

- the ability of electricity service providers to make informed investment and operating decisions;
- the ability of parties responsible for oversight of performance to identify potential poor performance and to ensure compliance with good industry practice;
- policy and practice in other jurisdictions, in particular the merits of producing a Territory equivalent to the AER State of the Market report and the AEMO Statement of Opportunities report;
- the level of regulatory oversight of system planning and monitoring arrangements that are appropriate for the Territory;
- the adequacy of incentives for efficient and timely investment in network and generation assets;
- any practical constraints on the design and implementation of planning, monitoring and reporting arrangements and enforcement of good industry practice in operation and maintenance in the Territory; and
- all relevant economic and policy developments, including current and forecast economic conditions, the proposed national emissions trading scheme and the expanded renewable energy target.

2.44 The Commission is to recommend an efficient and effective course of action and provide detailed plans for the implementation of that recommendation.

2.45 The Commission's timetable for the review is set out in table 2.1 below.

Table 2.1: Timetable for Review of System Planning, Monitoring and Reporting

Date	Action
3 December 2010	Release of Issues Paper
14 January 2011	Submissions on Issues Paper
March 2011	Release of Draft Report
April 2011	Submissions on Draft Report
June 2011	Final Report submitted to the Treasurer

2.46 The Commission will consult with key interest groups and affected parties as part of this review.

Review of Electricity System Planning and Market Operation Roles and Structures

2.47 The Commission has separate terms of reference from the Treasurer to review and report on the efficiency of system planning and market operation arrangements, including the role and structure of the system control unit of PWC to identify a course of action that ensures the allocation of functions to do with system planning and market operation promote efficient and reliable electricity system performance.

2.48 The Commission intends initiating the Review of Electricity System Planning and Market Operation Roles and Structures by releasing a Draft Report in March 2011, together with the Draft Report for this Review of System Planning, Monitoring and Reporting. This approach allows an effective and informed discussion of the functions and responsibilities associated with system planning and market operation.

CHAPTER 3

Power system and distribution network planning

Planning – functions and activities

- 3.1 System and distribution network planning involves looking forward to the medium (the next two or three years) and long term (up to 20 years) to assess the adequacy of the power system and distribution network relative to the forecast future demand.
- 3.2 The expectation is that individual companies will use the planning outcomes to make investment decisions based on commercial imperatives that ensure that new capacity is available to maintain reliability and security standards, on a cost effective basis.
- 3.3 Planning should support the identification of the most economic future options for augmentation and expansion of infrastructure to meet expected customer demand, and the management and coordination of the preferred investment actions to ensure new generation, transmission and distribution capacity is available to maintain reliability and security standards, on a cost effective basis.
- 3.4 The Commission noted in the 2004-05 Power System Review that:²²
- ...the power system must respond to changes in the level and location of demand. Decisions are required on what and where new generating, transmission and distribution capacity is needed to meet customer demands and maintain quality standards.... Managing and coordinating the development and expansion of the system so that it continues to meet customer demands in the future is known as power system planning.*
- 3.5 Infrastructure investment decisions and reliability and security of supply outcomes are influenced by the internal decision making processes of individual companies, and the following external factors:
- regulation of reliability and security standards and technical operating parameters;
 - generation last resort provider arrangements;
 - regulation of the distribution network planning process; and
 - government policy.

Internal decision making processes

- 3.6 Every generator, TNSP and DNSP will have their own decision making processes that determine their approach to investment and operations. However, based on good

²² Utilities Commission, 2004-05 Power System Review, December 2005, page 8.

industry practice, common features of the decision making process followed by an electricity company include:²³

- load forecasting, including forecasts of maximum demand for specific locations and the system, and forecasts of customer and annual energy consumption. Basic load forecasts can be developed by conducting a trend analysis of historical loads to produce the future forecast. More sophisticated load forecasting practices and tools are now commonly used, with companies applying standard weather corrections, econometric modelling, probabilistic techniques and scenario analysis;
- assessment of system and distribution network adequacy, to understand the current and future capability of assets needed to meet security and reliability criteria and outcomes, and to assess the optimum timing and priority of augmentation, expansion or replacement projects. Companies have discretion about the nature and timing of an investment required to meet those criteria;
- economic analysis of options to improve the security or reliability of supply, and to replace or refurbish ageing and potentially unreliable assets. The methodology and assumptions of an economic analysis are typically at the discretion of the company; and
- internal approvals, works programming and capital governance, starting with the process for approval of individual capital projects and capital programs, through to the final installation and commissioning, and ending with a post implementation report on the project cost, timing and effectiveness. The approach to program and project management is at the discretion of the company.

3.7 The internal planning processes adopted by a generator or network service provider should facilitate each business delivering electricity services that meet relevant reliability and security standards, on a cost effective basis.

Reliability and security standards

3.8 Reliability and security of supply standards and equipment performance requirements are defined to establish the performance and operational outcomes expected of infrastructure. These standards guide decisions about investment in infrastructure, including generators, transmission lines, substations, switching equipment and distribution feeders.

3.9 Standards are commonly set at a level appropriate to the circumstances, with a range of conflicting factors requiring a trade-off between the benefits to customers of higher standards of reliability and security with the higher capital and operating costs. Decisions about the standards adopted for a power system or distribution network should be explicit so that the service provider can be held accountable for both performance outcomes and costs.

3.10 Maintaining security and reliability standards relies on the components of the electricity supply chain operating within defined technical parameters, which collectively

²³ This list of activities was developed with reference to good industry practice in the NEM, including as documented by SKM for the AEMC, May 2009, Advice on Development of a National Framework for Electricity Distribution Network Planning and Expansion Final Report.

determine the expected performance outcomes for the power system and distribution network:²⁴

- reliability refers to the ability of the power system and distribution network to deliver sufficient electricity to meet customer demand at all times, taking into account scheduled and reasonably expected unscheduled outages. Reliability of supply standards represent the targets for frequency and duration of outages that should be experienced by customers on average;
- security refers to the ability of the power system and distribution network to avoid customers being adversely affected by the failure of a component, such as the loss of a network circuit, tripping of a generator, or failure of a transformer. In the NEM, a range of such single failures are referred to as a credible contingency. A secure system (or distribution network) is one operating within the defined parameters and expected to remain within these parameters if there is a credible contingency event,²⁵ and
- equipment performance requirements refer to the conditions for connection of any plant and equipment to the power system or distribution network. Generators and network users must ensure that their equipment does not adversely affect reliability or security of supply.

Power system

3.11 The reliability and security criteria and technical performance requirements for generation and transmission in the Territory are outlined in the System Control Technical Code.

3.12 The System Control Technical Code states that System Control will adopt the following generation reliability criteria when operating the power system:²⁶

- N-1, that is, there is sufficient stand-by plant in the power system to cater for the loss of a single 'on-line' generator, though in many cases short periods of involuntary load shed may occur; and
- System Control will use available spinning reserve in the system and/or quick start stand-by plant to reconnect customers and restore the power system to normal.

3.13 This is an operational requirement which does not provide either:

- a specific standard against which individual incidents can be tested; or
- a longer term target for the reliability of the system against which the generation investment program can be tested.

²⁴ Utilities Commission, 2004-05 Power System Review, December 2005, page 8, and also drawing on concepts discussed in Chapter 3 of that paper. The technical envelope is 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.

²⁵ The National Electricity Rules, 4.2.3, defines a credible contingency event as an event affecting the power system that the system operator expects would be likely to involve the failure or removal from operational service of one or more generating units and/or transmission elements, and that is considered to be reasonably possible in the surrounding circumstances. What is considered credible is not fixed, with the system operator required to identify abnormal conditions (e.g. bushfire, lightning) that pose added risks to the power system, and determine if a previously non-credible event (e.g. a double circuit transmission line failure) should be treated as a credible contingency event.

²⁶ System Control Technical Code (v3), May 2010, s.3.2.2.

- 3.14 The Commission notes that the generation reliability criteria adopted by PWC for system planning and generation investment purposes is N-2 (i.e. reserve capacity should be sufficient to meet demand if the largest two units of capacity are not available), and that this criteria is set by agreement between PWC and the shareholding Minister.
- 3.15 However, there is no explicit link between the generation reliability criteria and the duration and frequency of generation related power outages, and the Commission is not aware of any explicit or public assessment or community consultation on the appropriate generation reliability and security standards.
- 3.16 In contrast, the NEM establishes a Reliability Standard for generation which specifies a required reliability outcome by defining the minimum acceptable level of electricity supply to be delivered to customers in a region measured against the total demand of consumers in that region. The standard is expressed as the maximum permissible unserved energy (USE) and measures the expected amount of energy at risk of not being delivered to customers due to a lack of available capacity. The level was set at 0.002 per cent unserved energy in 1998, and has remained at this level.²⁷
- 3.17 Generators and AEMO use the NEM Reliability Standard to identify the timing and type of new generation investment. Effectively, the NEM Reliability Standard specifies the reliability outcome that needs to be achieved, without specifying a particular investment outcome. The existing Territory arrangements specify a particular investment outcome without reference to a reliability outcome.
- 3.18 The Commission understands that PWC Generation is currently adding new capacity in the Darwin-Katherine system to increase the available installed plant to N-4. This investment strategy is in response to the deteriorating condition of existing generation plant, and the increased risk of declining reliability outcomes. The Commission understands that the N-4 criterion was determined following an assessment of capacity required to complete the planned maintenance program. However, the Commission has not been advised of the expected reliability outcomes of meeting the N-4 criteria.
- 3.19 The Commission has proposed in a separate Review of Electricity Standards of Service²⁸ that the Territory's regulatory framework define a USE target for the Territory's power systems. This would establish a reliability target that would inform generation investment decisions (i.e. whether the system operates under an N-1 or N-2 criteria or some other measure of available capacity).

Electricity networks

- 3.20 The reliability and security criteria and equipment performance requirements for the Territory's electricity networks are specified in the Network Connection Technical Code. Unlike the NEM, the Territory's regulatory framework does not deal separately with electricity transmission and distribution.

²⁷ Australian Energy Market Commission Reliability Panel, April 2010, Reliability Standard and Reliability Settings Review Final Report, pages 5 and 9.

²⁸ The Final Report for the Review of Electricity Standards of Service is available on the Commission website at http://www.nt.gov.au/ntt/utilicom/publications/reports_publications.shtml.

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- 3.21 PWC Networks is required to adopt an N or N-1 network reliability criteria:²⁹
- the transmission network connecting major power stations to zone substations should be designed to meet the N-1 criterion, so that there is no loss of load with the loss of a network component; and
 - the remainder of the network may be designed to the N criterion, so that the loss of a network component may cause the loss of all loads in the area.
- 3.22 The Network Connection Technical Code states that PWC Networks will conduct a risk/benefit analysis, and consider capital investment priorities, social needs, the environment and land use when assessing the reliability criteria to be adopted for specific network assets or network sections.
- 3.23 There is currently no direct relationship between the reliability criteria and the duration and frequency of network related power outages. Reliability outcomes are determined through the investment priorities of the PWC Networks capital and maintenance programs. However, the Commission has foreshadowed the option of specifying target network reliability outcomes as part of the network price determination process for the 2014-19 network price regulatory period. In particular, the Commission has proposed establishing average and minimum performance standards for each of the feeder types in the distribution network.³⁰ PWC Networks would be responsible for translating these reliability targets into reliability criteria that are achieved through the capital and maintenance program.
- 3.24 This is consistent with the approach taken for DNSPs elsewhere in Australia, where the economic regulator or the relevant jurisdiction define service performance measures. For example, the AER has a service target performance incentive scheme that establishes financial incentives for DNSPs to maintain or improve reliability outcomes.
- 3.25 The Commission has proposed similar arrangements be adopted in the Territory in a Review of Options for Implementation of a Customer Service Incentive Scheme for Northern Territory Electricity Customers for the Territory Government.³¹ The Commission proposed that the Territory Government establish a guaranteed service level scheme, by which individual customers receive payments if PWC Networks does not meet minimum acceptable standards of service to those individual customers.
- 3.26 The Commission also foreshadowed introducing a financial incentive scheme as part of the network price determination process for the 2014-19 regulatory period, by which PWC Networks is rewarded or penalised through higher or lower electricity prices for service performance.
- 3.27 The Territory's operating criteria are generally similar to the criteria outlined in the National Electricity Rules, outlining requirements for operating frequency, voltage magnitudes, quality of supply and stability (with reference to Australian Standards).³²

²⁹ Network Connection Technical Code (v2), April 2003, s.2.7.

³⁰ Refer the Final Report for the Review of Electricity Standards of Service.

³¹ Utilities Commission, Final Report: Review of Options for Implementation of a Customer Service Incentive Scheme for Northern Territory Electricity Customers, August 2010.

³² Network Connection Technical Code (v2), April 2003. In particular, refer chapter 2. For a comparison with the National Electricity Rules refer the National Electricity Rules (v39), 4.2.5 and chapter 5.

System Control is responsible for maintaining power system security within the design and operating limits determined by PWC Networks (and approved by the Commission).³³

3.28 PWC Networks investment decisions are guided by the Network Planning Criteria:³⁴

The purpose of planning criteria is to help strike a balance between the user's need for a safe, secure, reliable, high quality electricity supply and the desire for this service to be provided at minimal cost.

3.29 The Network Planning Criteria are a set of standards applied to maintain network security and reliability, and are used as a planning and design tool to protect the interests of all networks users by managing reliability and quality of supply and avoid network instability.³⁵ The Network Planning Criteria explain how PWC Networks will treat the reliability and security criteria specified in the Network Connection Technical Code.

3.30 The Commission understands that PWC Networks is currently reviewing the Network Planning Criteria. Before amending the Network Planning Criteria in a material way, PWC Networks is required to undertake public consultation on the proposed amendments. The Commission understands that this is likely to occur in early 2011. Amendments must be approved by the Commission.³⁶

Preliminary views

3.31 The Commission considers that the regulatory framework does not currently set clear reliability and security standards for the power systems or electricity networks. The implication is that service providers make investment decisions without reference to a specific standard, which makes it difficult to hold service providers accountable for the cost and reliability of supply.

3.32 The Commission considers that there should be clear reliability and security standards for generation, transmission and distribution to guide operational and investment decisions, and to make service providers accountable for their performance.

3.33 The Commission developed proposals as part of a Review of Electricity Standards of Service to define reliability performance outcomes for generation, transmission and distribution networks in the Territory. The options considered include:

- determining the maximum permissible unserved energy for the Territory's power systems. The USE level would inform consideration of minimum generation reserve levels, and identify requirements for investment in new generation capacity; and
- determining targets for the average duration and average frequency of network related outages. These targets would inform the PWC Networks investment decisions.

³³ Network Connection Technical Code (v2), April 2003, s.5.3.2.

³⁴ Network Planning Criteria (v2), April 2003, page 3.

³⁵ Network Planning Criteria (v2), April 2003, page 7.

³⁶ Electricity Networks (Third Party Access) Code, cl.9.

- 3.34 The Commission's view is that System Control and PWC Networks should ensure that the generation and network reliability performance outcomes should align with reliability and security standards.

Question 1.

What additional matters do you believe need to be addressed to ensure that the Territory's regulatory framework establishes reliability and security standards for electricity generation, transmission and distribution that support effective investment outcomes?

Generation last resort provider arrangements

- 3.35 The Commission notes that, unlike the NEM, there is only limited generation competition in the Territory, with PWC Generation the sole market generator, and there is no regulatory involvement in generation investment decisions.
- 3.36 The National Electricity Rules establish a supplier of last resort mechanism for generation capacity in the NEM, with AEMO responsible for a reliability and reserve trader function for generation. The intention is to ensure reliability of supply and, where practicable, security of supply, when there is a projected shortfall in reserve generation capacity.³⁷
- 3.37 The purpose of the generation last resort provider arrangements is to prevent a situation where necessary investment in capacity is not made by market participants. For example, due to the individual commercial reasons of generators, a situation may arise where available and planned generation capacity may not be sufficient to meet forecast peak demand. If this is the case, AEMO may currently obtain capacity from appropriate sources to ensure reliability of supply.

Preliminary views

- 3.38 The dominant market position of PWC Generation poses the question whether there is a need for greater regulatory involvement in generation investment in the Territory while there is limited generation competition to ensure that decisions to invest in new generation capacity are efficient, and consistent with the long term interests of customers.
- 3.39 The market power of PWC Generation is currently effectively equivalent to that of a network service provider. Where a company or industry has the potential for exercising monopoly power, regulatory measures, such as the regulation of service performance or planning processes might be needed to ensure that acceptable service performance is maintained.³⁸

³⁷ Refer National Electricity Rules, Rule 3.20; and AEMO, Interim Amendments to the Procedure for the Exercise of Reliability and Emergency Reserve Trader, November 2009. AEMO may determine to enter into *reserve contracts* to ensure that the reliability of *supply* in a *region* or *regions* meets the relevant *power system security and reliability standards* established by the *Reliability Panel* for the *region* and, where practicable, to maintain *power system security*. This Rule expires on the earlier of 30 June 2012 or a date decided by the AEMC on the advice of the Reliability Panel.

³⁸ Essential Services Commission of South Australia, November 2008, South Australian Distribution Service Standards 2010-15 Final Decision, pages 7-8.

- 3.40 In the absence of any generation competition in the Territory, PWC Generation has provided all major new generation capacity installed in the market systems in recent years. This outcome can be attributed to the absence of any useful information about when new capacity is required in the Territory, and a constrained fuel supply.
- 3.41 However, there is no formal obligation on PWC Generation to invest in new generation capacity to ensure there is sufficient capacity to meet forecast demand. As such, there is a risk of a shortfall in generation capacity, and no clear mechanism for addressing that shortfall.
- 3.42 The main benefit of developing last resort provider arrangements for generation in the Territory is certainty that investment in generation capacity will be adequate to maintain reliability of supply, on a cost effective basis.

Question 2.

What additional matters do you believe need to be addressed to provide certainty that investment in generation capacity will be adequate to maintain reliability of supply?

Question 3.

What further or alternative regulatory arrangements would assist in achieving efficient and effective generation investment outcomes?

Regulation of the electricity network planning process

- 3.43 Regulatory involvement in the decision making processes of network service providers in Australia generally includes:
- the five yearly determinations by the regulator of a TNSPs or DNSPs access charges and revenues, with the determination process involving the regulator assessing whether a company's capital and maintenance programs are prudent and efficient. This process tests the adequacy of a firm's decision making processes and investment decisions;
 - jurisdictional standards for reliability and security of supply, particularly for the average frequency and duration of network outages. These jurisdictional standards inform regulatory decisions about network revenues, and the associated capital and maintenance programs; and
 - a Regulatory Investment Test. For example, TNSPs in the NEM are required to conduct a regulatory investment test for transmission (RIT-T), a project assessment process for identifying the transmission investment option which maximises net economic benefits, and where applicable, meets the relevant jurisdictional or Rule based reliability standards.³⁹
- 3.44 Regulatory involvement in the investment decisions of a network service provider is a result of the natural monopoly characteristics of network infrastructure, and the

³⁹ AER, March 2010, Explanatory Statement Draft regulatory investment test for transmission and regulatory investment for transmission application guidelines, page 1. Refer National Electricity Rules, Rule 5.6.5B.

potential for network related investment decisions to reflect a company's commercial interests, rather than the long term interests of customers.

- 3.45 Practice in Australia and in the Territory⁴⁰ is for the economic regulator to take into account the reliability and security standards applying to each network service provider during the five yearly revenue determination process. These standards are set by each jurisdiction.
- 3.46 The RIT-T and the foreshadowed regulatory investment test for distribution (RIT-D)⁴¹ involve limited regulatory involvement in decisions by electricity businesses about specific investments. The RIT-T (and shortly the RIT-D) is imposed through the National Electricity Rules. However, the RIT only influences decisions for specific investments that meet certain criteria.
- 3.47 The Territory's regulatory framework does not require transmission or network investments to undergo a public project assessment process. However, the Commission has the ability to test network planning and investment decisions against reliability and security criteria through the five yearly network price determination process.

Preliminary views

- 3.48 The Commission has foreshadowed the option of adopting a forward looking building blocks approach for the next network price determination process for the regulatory period 1 July 2014 to 30 June 2019. This which would include assessing the future forecast performance of the Territory's networks against defined standards, and making a judgment about whether planned capital and maintenance expenditure for the regulatory period is efficient and prudent. The Commission anticipates establishing average and minimum performance standards for each of the feeder types in the distribution network, and for the network as a whole prior to the start of the July 2014 to June 2019 determination process.
- 3.49 The Commission is aware of the recent Ministerial Council on Energy (MCE) decision to introduce a RIT-D, which would require DNSPs to comply with a defined process for assessing and consulting on network investment options. The Commission will follow the development of the RIT-D arrangements, and the practical experience applying them in the NEM, to determine if similar arrangements would be appropriate for the Territory.

Question 4.

What further or alternative regulatory arrangements would assist in achieving efficient and effective distribution network investment outcomes?

⁴⁰ The approach taken by the Commission in determining the revenues of PWC Network for the period July 2009 to June 2014 is available in a series of documents available from the Commission website, at http://www.nt.gov.au/ntt/utilicom/electricity/networks_pricing.shtml.

⁴¹ The Ministerial Council on Energy has agreed to introduce a RIT-D for DNSPs in the NEM. A proposed Rule change is to be submitted to the AEMC by December 2010. MCE Standing Committee of Officials, Bulletin No. 184, October 2010.

Government policy decisions

3.50 Governments can choose to intervene in the planning process by mandating or restricting a particular investment outcome. Examples include:

- the Council of Australian Governments' February 2006 decision to mandate the progressive national roll out of smart meters, where the benefits outweigh the costs;⁴² and
- the Western Australian Government policy of restricting the generation capacity of Verve Energy, the government owned generation company, to about 60 per cent of market share.⁴³

3.51 Government policy decisions to mandate a specific planning outcome or investment decision are generally applied through legislation. Electricity businesses will have extensive opportunities to contribute to the development of government policies affecting electricity system operation and planning.

⁴² Council of Australian Government Communiqués, February 2006 and April 2007, and COAG National Reform Agenda, Competition Reform, April 2007.

⁴³ Verve Energy, Statement of Corporate Intent 2010-11, page 12. In 2006 the Minister issued a Direction imposing a 3000 MW cap on Verve's non-renewable generating capacity.

CHAPTER 4

Power system and distribution network monitoring

Monitoring – functions and activities

- 4.1 Monitoring involves obtaining performance data and assessing the performance of the power system and distribution network against reliability and security standards to confirm that electricity assets can and will perform as expected.
- 4.2 Monitoring arrangements should assist in identifying if the system and infrastructure are capable of meeting reliability and security criteria, and that adequate capacity is available to meet future forecast demand. This assists in holding the service provider accountable for achieving the expected performance outcomes over the medium term.
- 4.3 Monitoring occurs through:
- assessing if a service provider’s operating practices comply with regulatory requirements. This involves the economic regulator or system operator requiring a company to demonstrate compliance with technical obligations. For example, the Commission can require a generator to demonstrate compliance with regulatory instruments, and System Control ;⁴⁴
 - testing assets and equipment to ensure they comply with relevant technical and design parameters. For example, PWC System Control can require generators to test and demonstrate the performance capabilities of their equipment;⁴⁵
 - investigation of power system incidents where equipment failure, natural events or operator error causes the significant deviation from normal operating conditions. The investigation of the cause of power system incidents should identify opportunities to ensure operating practices and the regulatory framework facilitate a reliable and secure system. For example, AEMO is required to review and report on operating incidents 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;⁴⁶ and
 - measuring the reliability and quality of supply outcomes of generation and networks infrastructure – e.g. measuring the duration and frequency of power outages, frequency and voltage levels. PWC System Control continuously monitors and manages frequency and voltage levels to ensure the reliable and secure operation of the power system.
- 4.4 Monitoring makes a service provider accountable for their performance against relevant obligations and standards.

⁴⁴ PWC Generation Licence, cl.10.

⁴⁵ System Control Technical Code (v3), May 2010, s6.24.

⁴⁶ National Electricity Rules 4.8.15.

Monitoring regulatory and technical compliance

4.5 The Territory's regulatory framework establishes behavioural and technical obligations on electricity service providers to require certain activities and outcomes:

- the behavioural obligations relate to the commercial dealings of the company. For example, the Ring-Fencing Code specifies how a company that operates a monopoly business should act in commercial transactions with related and third parties. The Electricity Networks (Third Party Access) Code specifies how PWC Networks should provide third party access to the network, and how network access prices are determined; and
- the technical obligations relate to the reliability and security criteria, technical requirements for connection to the network and system operating practices. For example, the Network Connection Technical Code states that Users (generators or load users) will have sufficient facilities available and operable for their own black start requirements, and each generator will have in place black system procedures (approved by the Network Operator in consultation with System Control).⁴⁷

4.6 Electricity service providers operating in the Territory must have a licence granted by the Commission. A condition of these licences is that the business complies with obligations in applicable codes, rules, protocols and standards established under relevant industry regulation legislation, and be able to demonstrate compliance to the Commission.⁴⁸

4.7 The Commission's expectation is that licensees should establish and maintain a compliance process that incorporates appropriate internal policies, procedures and systems for ensuring compliance with all relevant obligations. Features of a compliance process are policies, procedures and systems for:

- training of employees about the obligations applying to the business;
- regular internal audit and reporting by the business of compliance with its obligations;
- dealing with any complaints made by a customer or other third party to the licensee in connection with non-compliance with its obligations; and
- detecting and reporting to the Commission any breach of the compliance process.

4.8 The Commission intends regularly testing the adequacy of PWC's (and other holders of standard electricity licences) compliance processes against the requirements of the Australian Standard 3806 Compliance Programs. The Commission considers that the AS 3806 represents good industry practice for developing and managing compliance processes, providing the principles and guidance for designing, developing and maintaining and improving a flexible, responsive, effective and measurable compliance program.

Preliminary views

4.9 The Commission has been working closely with PWC during 2009-10 to assist PWC develop appropriate compliance processes for achieving and demonstrating compliance with regulatory obligations and technical performance requirements.

⁴⁷ Networks Connection Technical Code (v2), April 2003, s.5.8.8 and s.5.8.9.

⁴⁸ *Electricity Reform Act*, s.24.

- 4.10 For 2009-10, the Commission has required PWC to report on:
- compliance with licence and Ring-Fencing Code obligations, by examining compliance practices and outcomes for a sample of obligations;
 - compliance with the System Control Technical Code, by examining compliance practices and outcomes for a sample of obligations; and
 - the adequacy and appropriateness of compliance systems and processes that existed in 2009-10 to ensure compliance with licence obligations, by comparing the existing processes with AS 3806.
- 4.11 The Commission's approach is consistent with that adopted by regulators elsewhere in Australia. In particular, the Commission has been guided by the approach of the AER, which is charged with monitoring compliance with the National Electricity Law and the National Electricity Rules.
- 4.12 The AER assesses regulatory and technical compliance of businesses operating in the NEM by undertaking regular audits to determine if they have adequate compliance programs, and their operating practices and equipment meet NEM technical parameters.⁴⁹ The AER may:⁵⁰
- monitor compliance with the national energy framework;
 - investigate breaches or possible breaches of the framework; and
 - institute and conduct proceedings in relation to breaches, and appeals from decisions in those proceedings.
- 4.13 The Commission considers that adopting the monitoring practices similar to those used by the AER in the NEM, and focusing on the adequacy of the electricity businesses compliance processes, will assist improvements to reliability and security of supply in the Territory.⁵¹ The AER approach to compliance is based on assessing the risk of the impact and probability of service providers breaching particular obligations.
- 4.14 The monitoring activities of the AER include:⁵²
- market monitoring – monitoring activity in the gas and electricity wholesale markets, including bidding and rebidding, dispatch and prices, network constraints and outages, and forecasts of demand, production and capacity. This information is used to assess service providers compliance with market rules and system security requirements;
 - targeted compliance reviews throughout the year. The reviews complement the AER's broader market monitoring activities, and requesting service providers provide information on their compliance with a particular obligation or group of related obligations; and
 - audits to assess a service providers' compliance with specific obligations. The audits will often focus on technical obligations.

⁴⁹ National Electricity Rules 4.15. The AER regularly audits NEM participants to determine if they have a compliance program, and their practices and equipment meet NEM requirements.

⁵⁰ Australian Energy Regulator, June 2009, Compliance and Enforcement – Statement of Approach, page 2.

⁵¹ AER, June 2009, Compliance and Enforcement: Statement of Approach. This document sets out the AER approach to monitoring compliance and responding to breaches of obligations.

⁵² Ibid. page 3.

- 4.15 The monitoring of regulatory and technical compliance of electricity companies by regulators encourages those businesses to understand and meet their obligations. In doing so, they should take actions that contribute to the reliable and secure operation of the power system.

Question 5.

What additional matters do you believe need to be addressed to ensure appropriate and effective monitoring of regulatory and technical compliance in the Territory?

Testing equipment capability and performance

- 4.16 The Network Connection Technical Code and System Control Technical Code require the testing of the capability and performance of electricity plant and equipment. The testing regimes are to confirm if the generation and network components of the power system will perform as required by relevant technical and design parameters.
- 4.17 The focus of the testing regime is to confirm if plant and equipment connected to the network conforms to the requirements of the technical envelope and security criteria. The Network Connection Technical Code provides PWC Networks (as network operator) with the ability to inspect and test the equipment of a facility (a generator or load user) and the operation and maintenance of that facility to:⁵³
- assess compliance by the user with its operational obligations;
 - investigate any possible past or potential threat to power system security; or
 - conduct any periodic familiarisation or training associated with the operational requirements of the facility.
- 4.18 Further obligations in the Network Connection Technical Code requiring testing of the capability of generation and network components to demonstrate compliance include tests to demonstrate compliance with connection requirements for generators, routine testing of protection equipment and power system tests.⁵⁴

Power system

- 4.19 During 2009-10, the Commission approved a variation to the System Control Technical Code initiated by System Control to establish obligations for generators to establish and undertake testing regimes to confirm the performance capability of scheduled generating units.⁵⁵
- 4.20 System Control considered the new obligation to be consistent with the approach introduced in the NEM following the AEMC Reliability Panel Review to Develop the Template for Generator Compliance Programs.
- 4.21 The template seeks to define “good electricity industry practice” in the management of generator plant performance and adherence to standards (but does not of itself fully

⁵³ Network Connection Technical Code (v2), April 2003, s.4.1.1 (a).

⁵⁴ Network Connection Technical Code (v2), April 2003, Chapter 4, ss.4.1.3, 4.1.4 & 4.1.7.

⁵⁵ System Control Technical Code (v3), May 2010, s6.24.

define nor guarantee good electricity industry practice), and hence provides certainty for generators as to what is required of their compliance programs. Generators must develop and maintain compliance programs in line with the template.⁵⁶ The approach adopted in the template for generator compliance programs anticipates that:⁵⁷

- generators will institute and maintain generator compliance programs based on the template;
- the AER will regularly conduct spot audits of selected generators' compliance programs as part of its compliance monitoring activities; and
- generators will engage with their own external auditors to independently audit their compliance programs to determine whether they are required to amend their compliance programs and amend if required.

4.22 In the Territory, System Control is responsible for specifying the type and frequency of testing, with the requirements for each generator set out in the Secure System Guidelines (a document developed and maintained by System Control). The purpose is to ensure System Control and PWC Networks have up to date performance capability information, and are able to operate the system in a secure manner.

Electricity networks

4.23 The Territory's regulatory framework does not put as great an emphasis on external independent oversight of the testing of network equipment. This is considered consistent with the regulatory approach adopted elsewhere in Australia, with the onus on DNSPs to understand the condition of network assets and ensure compliance with technical performance requirements. The reason is practical – electricity networks comprise a large number of components, making regular and comprehensive testing a laborious process.

4.24 Consequently, the testing of network equipment capability and performance is a matter for the DNSP, and managed through the maintenance program. There is some oversight of the adequacy of testing regimes:

- by regulators monitoring technical compliance, and through the five yearly network access price determination process (which can involve a detailed assessment of the maintenance program and practices); and
- by establishing financial incentives, with financial rewards or penalties for network reliability performance (e.g. a guaranteed service level scheme which offers payments to customers where reliability is very poor).

4.25 PWC Networks has put significant effort into developing testing capability and testing regimes since the equipment failures at CZS in September and October 2008. This is correcting an acknowledged past deficiency in testing asset capability and performance.

⁵⁶ AEMC Reliability Panel, Final Report: Review to Develop the Template for Generator Compliance Programs, July 2009, page iv.

⁵⁷ AEMC Reliability Panel, Final Report: Review to Develop the Template for Generator Compliance Programs, July 2009, page 2.

Preliminary views

4.26 The Commission is concerned that the testing of equipment capability and performance may not yet be at the standard of good industry practice, despite the findings of the Davies Enquiry and PWC's subsequent response.

4.27 In investigating the 30 January 2010 Darwin-Katherine System Black, System Control found that:⁵⁸

...performance of the 132kV protection schemes and 132kV circuit breakers remained a concern. Priority maintenance of the circuit breakers occurred to resolve this situation.

...performance of the protection schemes was less than expected. Extensive investigations identified malfunctioning relays and these were progressively replaced over the following months. Overall the protection schemes have been declared as nearing end of life and PWC Power Networks have indicated a replacement project is underway, although is unlikely to be completed by the 2010/2011 storm season. While the equipment remains fully functional, this issue does impact power system security going forward.

4.28 The Commission considers that developing confidence in the testing regimes in the Territory, and system security, requires action by the Commission, System Control and PWC Networks. Options for developing confidence that equipment capability and performance is well understood in the near term include:

- routine examination of the extent that System Control, PWC Networks and generators comply with testing requirements established in the Network Connection Technical Code and System Control Technical Code;
- regular examination of whether generators are complying with generator testing requirements established in the System Control Technical Code; and
- reviewing whether existing regulatory arrangements for ensuring system security are adequate.

4.29 In the longer term, the Commission expects that PWC Networks' capital and maintenance programs (including testing regimes) will be developed to achieve defined performance outcomes, and supported by appropriate financial incentives.

Question 6.

What additional matters do you believe need to be addressed to ensure the existing regulatory arrangements and approach to testing equipment capability and performance in the Territory are adequate?

⁵⁸ System Control, Darwin Katherine Power System Investigation Report Arising from Black System of 30 January 2010, July 2010, page 23.

Question 7.

What additional comments do you have about the Commission's preliminary views on options for encouraging effective and appropriate testing of equipment capability and performance?

Investigating operating incidents

- 4.30 The investigation of an equipment failure, natural event or other incident that causes the power system or distribution network to operate outside normal parameters can provide information to improve the reliability and security of a power system.
- 4.31 In the NEM, AEMO is required to review and report on operating incidents 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.⁵⁹ In the Territory, System Control may investigate incidents into faults and major incidents.⁶⁰ In each case, system participants must cooperate with the investigation.
- 4.32 The National Electricity Rules require AEMO to investigate and report on reviewable operating incidents, according to guidelines developed by the AEMC Reliability Panel.⁶¹ The Rules and guidelines provide an explicit definition of what constitutes a reviewable operating incident. AEMO publishes the investigation reports on its website.
- 4.33 The Commission has been developing options to establish more robust and effective incident investigation and reporting arrangements, after concluding that the current arrangements are not consistent with good industry practice. The key problems are:
- investigation of incidents is at the discretion of System Control, and there is no guidance given to System Control as to what constitutes a fault or major incident, and when an investigation is required; and
 - there is no requirement for System Control to report publicly about the cause of an incident and the response.
- 4.34 In developing the proposed arrangements, the Commission has been guided by the process and approach adopted in the NEM and in Tasmania. The Tasmanian regulator may investigate incidents affecting Tasmanian electricity customers. A Guideline for Incident Reporting for the Tasmanian Electricity Supply Industry:⁶²
- establishes the trigger levels for generating a report for the Regulator;
 - ensures that appropriate information is provided in such a report;

⁵⁹ National Electricity Rules 4.8.15 (c). Also see AEMC Reliability Panel, System Operating Incident Guidelines, September 2006 at <http://www.aemc.gov.au/Panels-and-Committees/Reliability-Panel/Guidelines-and-standards.html>.

⁶⁰ System Control Technical Code (v3), May 2010, s.6.23.

⁶¹ Refer Rules 4.8.15 and 8.8.1(a)(9).

⁶² Office of the Tasmanian Economic Regulator, Guideline for Incident Reporting for the Tasmanian Electricity Supply Industry(v2), November 2006. Refer, [http://www.energyregulator.tas.gov.au/domino/otter.nsf/LookupFiles/R_Incident_Reporting_Guideline_Vers_2_061101.pdf/\\$file/R_Incident_Reporting_Guideline_Vers_2_061101.pdf](http://www.energyregulator.tas.gov.au/domino/otter.nsf/LookupFiles/R_Incident_Reporting_Guideline_Vers_2_061101.pdf/$file/R_Incident_Reporting_Guideline_Vers_2_061101.pdf).

- establishes the appropriate reporting timeframes; and
- establishes the appropriate protocols for the dissemination of such information to the public.

4.35 The Commission notes that the Tasmanian arrangements were informed by NEM requirements and adapted to suit the smaller Tasmanian system prior to Tasmania's joining the NEM.⁶³

This guideline recognises and complements the incident investigation arrangements prescribed in the National Electricity Rules. The principal investigation obligation is on National Electricity Market Management Company Limited (NEMMCO) regarding incidents that affect the maintenance or restoration of power system security. While this is vitally important, in most instances customers do not directly see the effects of such incidents (with some notable exceptions). Such incidents may give rise to a change in the classification of power system security from a 'reliable' or 'secure' operating state to a 'satisfactory' operating state for a period of time. When such incidents do affect end-user supply, it is usually a very widespread and public incident with a commensurate level of public interest and scrutiny.

There is an underlying assumption in this higher level incident investigation scheme in the National Electricity Market (NEM), that participating jurisdictions will have a more detailed incident and investigation scheme directed at those matters more directly within the jurisdiction's sphere of regulation. To that extent there is no duplication or inconsistency as between this guideline and NEM arrangements.

4.36 The Commission anticipates that revised incident reporting arrangements will be introduced by amending the System Control Technical Code in early 2011.⁶⁴

Preliminary views

4.37 The Commission considers that the Territory's regulatory framework requires more comprehensive incident reporting arrangements that provide clear guidance about when and how an incident should be investigated.

4.38 The current arrangements are not consistent with good industry practice, and give rise to the possibility that incidents may not be investigated or that the findings of investigations may not be translated into improvements in the operating practices of industry participants – System Control, PWC Networks and generators.

4.39 System Control produced a very comprehensive report into the Darwin-Katherine system black of 30 January 2010 in July 2010. However, the Commission had reservations about the initial approach to PWC's investigation of the system black. The System Control report identified a range of problems with system operating practices, risk management and maintenance practices and system design that added to the extent and duration of the System Black. Particularly in light of this incident and PWC's

⁶³ Office of the Tasmanian Economic Regulator, Guideline for Incident Reporting for the Tasmanian Electricity Supply Industry(v2), November 2006, page 1.

⁶⁴ The process for amending the System Control Technical Code is specified in the System Control Licence, ss.15.3, 15.4 and 15.5.

initial response, the Commission considers that clearly documented requirements and processes for investigation and reporting on incidents are necessary to support ongoing improvements in the reliability and security of the power system and distribution network.⁶⁵

Question 8.

What additional matters do you believe need to be addressed to ensure effective incident reporting arrangements in the Territory?

Monitoring system performance

4.40 Monitoring system performance occurs to measure reliability and security of supply outcomes for generation and networks infrastructure over time to identify trends in system performance, and to inform assessment of system and distribution network adequacy.

Measuring performance trends

4.41 Electricity businesses collect reliability performance data to measure performance trends over time. This data is often reported by economic regulators, with a focus on electricity networks performance.

4.42 In the Territory, PWC Networks and PWC Generation collect data to determine the average duration and number of networks and generation related outages. Collection of such data is a requirement of the Territory's Electricity Standards of Service Code, and includes:⁶⁶

- the average duration of outages, based on the system average interruption duration index (SAIDI) for generation and the electricity network; and
- the average number of outages, based on the system average frequency index (SAIFI) for generation and the electricity network.

4.43 Similarly, Queensland DNSPs are required to collect (and report to the regulator) reliability performance data on SAIDI and SAIFI.⁶⁷ Such data is collected and reported by DNSPs across Australia.

4.44 This data shows the reliability performance of each feeder, each feeder category (CBD, urban, short rural and long rural) and the network as a whole, and gives information about the performance over time.

4.45 The performance trend can inform the DNSPs capital and maintenance programs and investment plans, by highlighting areas of good and poor performance and drawing attention to factors potentially affecting reliability (e.g. asset age and condition, animals, environmental and weather conditions, and vegetation).

⁶⁵ The Commission intends including discussion of the system black in the 2009-10 power system review.

⁶⁶ Utilities Commission, Electricity Standards of Service Code, December 2005. Go to, http://www.nt.gov.au/ntt/utilicom/electricity/standards_of_service.shtml.

⁶⁷ Queensland Competition Authority, Electricity Distribution: Service Quality Reporting Guidelines. Responsibility for reporting of service performance of Queensland DNSPs transferred to the AER on 1 July 2010.

Preliminary views

- 4.46 Monitoring system and distribution network performance provides critical information to the system operator, electricity businesses and regulators about system security.
- 4.47 The Commission considers that examining the adequacy of the processes used by the system operator, generators and the DNSP for measuring operating performance, and responding to problems. This could occur regularly as part of compliance monitoring exercises by System Control and the Commission.
- 4.48 Monitoring performance trends provides information about the health of the system and component assets, which could be used to inform system planning activities and determine investment priorities. Additionally, monitoring assists in making service providers accountable for achieving the relevant standards of service.
- 4.49 The Commission is currently examining options for revising the Territory's standards of service framework as part of a Review of Electricity Standards of Service. In particular, the Commission is developing proposals for PWC Networks and generators to measure generation, transmission and distribution reliability performance trends.
- 4.50 The Commission considers that measuring performance trends is consistent with good industry practice, and that reliability performance data should be collected and analysed by electricity businesses irrespective of any regulatory obligation to do so.

Question 9.

What additional matters do you believe need addressing to ensure the regulatory arrangements and approach to measuring performance and reliability performance trends are adequate?

CHAPTER 5

Reporting

Reporting – functions and activities

- 5.1 Reporting involves regularly providing comprehensive, consistent and reliable forward looking and historical information to industry participants, prospective participants, customers, regulators and policy makers on current and forecast infrastructure capability, and on the conduct and outcomes of planning processes and investment in the power system and distribution network.
- 5.2 Reporting is targeted at addressing particular areas of concern in the electricity supply chain by informing the energy industry and potential investors (and also policy makers and the community) about:
- the adequacy of capacity relative to forecast demand to provide confidence that generation and network capacity is sufficient to maintain security and reliability of supply over time;
 - the performance and health of the system and distribution network to provide information about system performance trends, regulatory and technical compliance (including equipment capability relative to security standards), and the findings of investigations into power system incidents; and
 - system development, to inform operating and investment decisions and facilitate coordination of investment.
- 5.3 The purpose of reporting is to inform stakeholders about power system and distribution network management and development, to inform operating and investment decisions, facilitate coordination of investment and to provide confidence that generation and network capacity is sufficient to maintain security and reliability of supply over time.
- 5.4 The focus and detail of reporting can vary for each electricity industry sector, individual electricity networks and regions (jurisdictions). These differences primarily reflect a local regulatory response to local supply conditions, such as weather, influences on demand growth and the design of the system or network.

Reporting requirements in the Territory

- 5.5 Regular public reporting on the performance of the Territory's systems occurs through:
- the Power System Review, a document published annually by the Commission to advise the Territory Government, current and potential electricity industry participants and the community on power system performance and capacity. The content of the power system review is specified in the *Electricity Reform Act* [s45];
 - the Standards of Service Performance report, a document published annually by the Commission to report the performance of PWC Generation, PWC Networks and PWC Retail against the reliability and quality of supply and customer service performance indicators in the Electricity Standards of Service Code; and

- Northern Territory Electricity Market Information statement, a document published annually by the Commission to report key electricity use, generation capacity and network statistics.
- 5.6 Additional reporting on the system and network performance occurs through the Half Year System Performance reports submitted by System Control to the Commission to advise on the technical performance and major incidents of the power system during the previous six months.⁶⁸ There is no requirement for System Control or the Commission to make these reports publicly available. The Commission used information in the half yearly report for the Darwin-Katherine system for January to June 2009 to prepare the 2008-09 PSR.⁶⁹
- 5.7 System Control also prepares investigation reports for major system faults and incidents.⁷⁰ These reports are provided to affected system participants. There is no requirement for System Control to make these reports publicly available in contrast with the situation in the NEM.
- 5.8 The Power System Review is the main source of information on the adequacy and performance of the Territory's market systems and networks. In preparing the power system review, the Commission:⁷¹
- develops forecasts of overall electricity load and generating capacity, in consultation with participants in the electricity supply industry;
 - reviews and reports on the performance of the Territory's systems;
 - advises on matters relating to the future capacity and reliability of the Territory's system relative to forecast load; and
 - publishes an annual review of the prospective trends in the capacity and reliability of the Territory's system relative to projected load growth.
- 5.9 The power system review is an evolving project, with the future content and approach informed by this review. In particular, the Commission is seeking to make reporting more consistent with practice elsewhere in Australia. However, the Commission also recognises that reporting should be fit for purpose, and targeted at addressing the priorities of the relevant power system, network or electricity industry sector.

Examples of reporting requirements in Australia

- 5.10 There are a range of reporting arrangements used in Australia's three electricity markets (i.e. the NEM, the Territory and Western Australia) and individual jurisdictions to provide electricity market information to industry participants.
- 5.11 The form and approach of reporting in Australia has undergone extensive change in recent years, with the transfer of jurisdiction specific reporting functions to AEMO, an

⁶⁸ System Control Technical Code, s.7.4. System Control is required to prepare and submit the Half Yearly System Performance Reports for the Darwin-Katherine, Alice Springs and Tennant Creek systems.

⁶⁹ System Control provided the Commission with a half yearly report for January to June 2009 for the Darwin-Katherine system in July 2009. Half yearly reports for the Darwin-Katherine, Alice Springs and Tennant Creek systems have been routinely provided for July to December 2009, and subsequent periods.

⁷⁰ System Control Technical Code (v3), s.6.23.

⁷¹ *Electricity Reform Act*, s.45.

increased focus on the capability of network assets to meet summer time peak demand, and the development of a consistent (NEM) framework for DNSP planning and reporting.

5.12 Examples of forward looking and historical reporting activities in Australia include:

Forward looking reporting

- the Electricity Statement of Opportunities (ESOO), a document published annually by AEMO to report on the electricity supply-demand outlook for the coming 10 years. The 2010 ESOO was released in August 2010, and provides forecasts of supply conditions and investment needs for 2012 to 2020 and demand forecasts for 2010 to 2020;
- the Power System Adequacy (PSA – two year outlook), a document published annually by AEMO to report on operational issues and the supply-demand outlook for the coming two years. The 2010 PSA was released in August 2010 to provide a short term assessment of the supply-demand outlook for 2010-11 and 2011-12;
- the National Transmission Network Development Plan (NTNDP), a document published annually by AEMO to report the AEMO view of the efficient development of the NEM transmission grid for the next 20 years under a range of credible scenarios. The 2010 NTNDP (the first) is to be released in December 2010;
- the South Australian Supply and Demand Outlook (SASDO), a document now published annually by AEMO, but previously prepared by the South Australian Electricity Supply Industry Planning Council. The 2010 SASDO was released in June 2010 to report to 2019-20 on annual and seasonal electricity forecasts, supply developments and sources and volumes of fuel required to support forecast generation;
- the Tasmanian Reliability Review, a document published annually by the Tasmanian Economic Regulator to report on the reliability performance of the integrated Tasmanian power system. The 2010 Reliability Review is to examine likely influences on future reliability performance in the next three to five years, and the effect on customers;⁷² and
- network planning and performance reports, which are prepared annually by DNSPs and TNSPs to report on matters including the network operating environment (e.g. load growth forecasts, and summer time peak demand), network and asset management policies and practices, network reliability and performance and network capability and works planning. The content of these reports depends on the requirements imposed by the jurisdiction, with examples including Queensland, New South Wales and Tasmania.⁷³

Historical performance reporting

- the State of the Energy Market report, a document published annually by the AER to provide an overview of Australia's electricity and natural gas markets;

⁷² 2010 review of the reliability of the Tasmanian power system, Terms of Reference, sourced from the Tasmanian Economic Regulator website.

⁷³ Examples of jurisdictional requirements include, the Tasmanian Electricity Code cl.8.3.2 requires Aurora to prepare a Distribution System Planning Report; the NSW Electricity Supply (Safety and Network Management) Regulation 2008 requires NSW DNSPs and TNSP to prepare a Network Performance Report; and the Queensland Electricity Industry Code, cl.2.3 requires DNSPs to prepare a Network Management Plan.

- the AEMC Reliability Panel annual market performance review, which reports on the reliability of the power system and the power system security and reliability standards for the previous year;⁷⁴
- power system incident reports, which are prepared by AEMO in the NEM. The Tasmanian regulator may investigate power system incidents affecting Tasmanian electricity customers. These incident investigation reports identify changes to systems and practices that might improve the reliability and security of the power system; and
- standards of service performance reports, which are prepared annually by regulators to report the performance of industry participants (mainly DNSPs and retailers) against the standards of service obligations imposed by each jurisdiction. The focus of these reports is the level of network reliability and customer service experienced by customers.⁷⁵

Preliminary views

5.13 The Commission considers that reporting is a vital tool for supporting effective planning, operation and timely and cost effective investment. The Commission has identified the following key considerations or features of reporting activities and practice:

- each reporting activity serves, or has served, to identify and report on the adequacy of capacity, or management or performance;
- the focus and priority of the reporting activities is not consistent across power systems, networks or jurisdictions, which recognises that the electricity supply conditions differ; and
- reporting priorities can change over time, which influences the scope and nature of the reporting activities that are necessary for dealing with the reliability and security concerns and priorities.

5.14 The Commission considers that reporting arrangements for the Territory should recognise the key concerns and priorities for the Territory's power systems and distribution networks. For example, the Commission's view is that the priorities of reporting in the Territory include:

- ensuring effective forecasting of demand growth, and reporting of system adequacy. Demand growth is volatile, with significant changes in demand from mining and industrial projects. Projects requiring substantial capacity augmentation are regularly mooted, but do not come to fruition. This volatility makes planning problematic, and poses a risk of generation or network capacity shortfalls or stranded capacity; and
- providing confidence about system and distribution network health. The small size of the Territory system and distribution network provides less scope for managing the risk of poorly maintained assets contributing to adverse reliability outcomes. A

⁷⁴ The report is required by the National Electricity Rules, 8.8.3(b). The AEMC has provided the Reliability Panel with standing terms of reference, <http://www.aemc.gov.au/Market-Reviews/Open/Annual-Market-Performance-Review-2010.html>.

⁷⁵ Examples of jurisdictional requirements include, the Independent Pricing and Regulatory Tribunal information papers on NSW DNSP and retailer operating statistics; Queensland Competition Authority reports on market customer statistics; and reporting by the AER of Victorian and Queensland DNSP reliability and quality of supply performance (following a transfer of this function from the state regulators).

good understanding of asset condition and of performance would encourage effective maintenance regimes, and assist good asset management outcomes.

- 5.15 The Commission considers that reporting should be dynamic, and recognise the key risks to the effective management of a power system and distribution network, according to good industry practice.
- 5.16 Reporting should also provide relevant, comprehensive, consistent and reliable information to industry participants, prospective participants, customers, regulators and policy makers. The information provided through a reporting framework should represent the information that is produced by, and necessary for, the delivery of a safe, reliable and secure electricity supply to customers.
- 5.17 Finally, the service provider should be held accountable for the information reported, potentially including through independent appraisal of planning and performance reports, by requiring explanation of variations in data over time, and by certification by the chief executive officer that the information meets all requirements.
- 5.18 The Commission notes that the chief executive officer of Queensland DNSPs is required to certify that the network management plan complies with all obligations and accurately represents the policies of the DNSP.⁷⁶ This assists in holding the DNSP accountable for meeting the reporting obligations.

Question 10.

What additional matters do you believe need addressing to ensure that reporting arrangements and activities for the Territory are appropriate?

Adequacy of capacity

- 5.19 The fundamental reason for assessing the adequacy of the system and distribution network is to determine whether there is sufficient capacity to meet forecast peak demand plus a minimum reserve. That is, is there, or will there be, sufficient generation capacity and network capacity to meet all relevant reliability and security criteria and keep the number and duration of power outages within acceptable levels?
- 5.20 Adequacy is assessed at the system (generation) level and for network connection points:
- assessing the adequacy of generation provides a top down view of the supply-demand balance over time, to identify any risk of a generation capacity shortfall relative to energy and peak demand projections in the short term (i.e. coming two years), and to inform decisions about generation investment in the long term (i.e. over 10 years); and
 - assessing the adequacy of transmission and sub-transmission network connection points (e.g. zone substations) provides a bottom up view of localised energy and peak demand over time (i.e. up to five years), to identify the risk that network components may not be able to meet forecast load.

⁷⁶ Queensland Electricity Industry Code, s.2.3.2 (l).

5.21 A further focus of system reporting in some jurisdictions (e.g. the Territory, South Australia and Western Australia) is the adequacy of fuel supplies.⁷⁷ The availability of a reliable and secure source and supply of fuel for electricity generation is necessary for a reliable and secure electricity supply. Consideration of the adequacy of fuel supplies in the three named jurisdictions probably reflects their historical isolation, and limited cost effective fuel sources or other sources of electricity supply isolation .

Power system

5.22 The Commission reports on the adequacy of generation through its Power System Reviews, projecting a supply-demand balance for the coming 10 years by comparing energy and peak demand forecasts with assumed future generation capacity.

5.23 For the 2008-09 Power System Review, the Commission requested information on:

- generation capacity at 30 June 2009, and advice on changes to capacity during 2008-09;
- projected capacity, and advice on the timing, location and size of planned new capacity and the timing of planned retirement; and
- system energy and peak demand forecasts to 2018-19.

5.24 The Commission used this information to develop a forecast of the supply-demand for each power system from 2009-10 to 2018-19, providing estimates of the adequacy of generation capacity under baseline, high and low demand growth scenarios to meet an N-2 reliability criteria.

5.25 However, the Commission became concerned in late 2009 about the reliability of these estimates, because of doubts about the condition of generation assets. The Commission's assessment was based on advice from PWC Generation that all generation assets were in good working order and generally available for operation.

5.26 The Commission did not have information necessary to confirm the capability of existing generation capacity. In particular, the Commission noted the sort of information required to assess generation adequacy would include:⁷⁸

...an informed assessment of the adequacy of system capacity should take account of the maintenance history and condition of generation plant, the potential for major equipment failure with extended replacement times, the duration and timing of planned overhauls and maintenance, the frequency of unplanned outages and the level of redundancy in supporting systems.

5.27 The Commission's concerns were borne out in early 2010 when PWC advised that generation equipment at Channel Island and Berrimah power stations was in a poor condition, and that urgent refurbishment or replacement of existing capacity was necessary. PWC's advice led to a view that there may not be sufficient reliable generation capacity available in the Darwin-Katherine power system to meet peak

⁷⁷ For example, refer Utilities Commission, 2008-09 Power System Review, March 2010; and AEMO, South Australian Supply and Demand Outlook, June 2010.

⁷⁸ Utilities Commission, 2008-09 Power System Review, March 2010, page 28.

demand, including an appropriate level of reserve capacity in place in case of plant failure.

5.28 AEMO reports on generation adequacy in the NEM, providing a 10 year projection of the generation supply-demand in the NEM to highlight opportunities for generation investment in each region. In 2010, AEMO decided to report the 10 year assessment in two documents:

- the PSA – focusing on operational issues, supply adequacy and market intervention triggers in the short term (years one and two); and
- the ES00 – providing an assessment of potential investment trends, based on economic growth potential, peak demand forecasts and generation capacities in the longer term (years three to 10).

Preliminary views

5.29 The Commission considers that the reporting by AEMO on system adequacy represents good industry practice, and equivalent reporting arrangements should be adopted in the Territory.

5.30 AEMO provides an assessment of generation adequacy for the coming two years in the PSA, and identifies any actions that AEMO might intend to address a capacity shortfall. The 2010 PSA also assesses system adequacy against operational criteria, such as capacity reserve, energy reserve and frequency control (i.e. operating matters relevant to maintaining system security and stability).⁷⁹

5.31 AEMO examines the supply-demand outlook by comparing forecast energy and peak demand for the coming 10 years with known and committed capacity and minimum reserve levels:⁸⁰

- energy and peak demand is projected for each region based on demographic, macroeconomic and sectoral forecasts. AEMO uses scenarios to counter uncertainty about the effect of future carbon policies on demand, with the scenarios developed jointly with the Australian Government Department of Resources, Energy and Tourism and a Stakeholder Reference Group;
- generation capacity for each region is based on current capacity, planned changes and formal commitments to build or install new capacity. AEMO also considers the seasonal variation in capacity (operating capacity is sensitive to ambient temperature), as advised by the plant owners;
- reliability and minimum reserve levels, which are an operational indicator of long term system reliability against the Reliability Standard. The adequacy of capacity and reserves is measured against the thresholds set by the minimum reserve levels; and
- supply-demand outlook – the regional projections of forecast supply versus forecast energy and peak demand. The outlook highlights the generation and demand side investment opportunities from potential shortfalls in existing or committed supply.

⁷⁹ AEMO, 2010 Power System Adequacy, June 2010. For example, the energy adequacy assessment considers any restrictions to the amount of energy that is available due to factors including fuel shortages, cooling water restrictions and environmental limits.

⁸⁰ AEMO, 2010 Electricity Statement of Opportunities, June 2010.

5.32 The Commission considers that the annual power system review covers similar ground as the AEMO reporting on generation and system adequacy.

Question 11.

What additional matters do you consider need to be addressed to ensure the Territory's arrangements for assessing and reporting on system and generation adequacy are appropriate?

Electricity networks

5.33 The Commission began examining the adequacy of the Territory's electricity networks in 2005, but concluded that insufficient information was available for the Commission to effectively assess the prospective capacity and reliability of the electricity transmission and distribution networks.⁸¹

5.34 The power outages caused by the CZS related failures in 2008 highlighted the risks of inadequate oversight of the capability of the electricity network. In response, the Commission requested PWC Networks provide information on network capacity, forecast peak demand and reserve margins for the 2007-08 Power System Review. The information request was based on network reporting requirements in other jurisdictions.

5.35 DNSPs operating elsewhere in Australia are generally obliged to report on an annual basis. The Territory's regulatory framework does not specifically oblige PWC Networks to report on network capability and future reliability performance.

5.36 The MCE announced in October 2010⁸² that the AEMC was to develop Rules to establish a national (NEM) framework for distribution network planning and expansion, including requiring DNSPs to prepare distribution annual planning reports. These reports are to include capacity and load forecasting information and identify and describe any forecast system limitations.

5.37 The proposed national arrangements would involve DNSPs reporting on an annual basis:⁸³

- forecasting information over the required planning period (typically five years). This would include capacity and load forecasts at the sub-transmission and zone substation level and, where they have been identified, overloaded primary distribution feeders;
- information on system limitations, including the location and timing, analysis of potential load transfer capability, impact on connection points, and potential solutions that may address each limitation;
- an explanation of the DNSPs planning methodology;

⁸¹ Utilities Commission, 2004-05 Power System Review, December 2005, page 5.

⁸² MCE Standing Committee of Officials, Bulletin No. 184, MCE Response: AEMC Review of a National Framework for Electricity Distribution Network Planning and Expansion, October 2010.

⁸³ AEMC, Review of National Framework for Electricity Distribution Network Planning and Expansion, September 2009, page 27.

- information on investments that have been assessed under the RIT-D and all other committed projects with a capital cost of \$2 million or greater that were “urgent and unforeseen” or replacements and refurbishment projects;
- a description of the network, regional development plans, outcomes from joint planning undertaken with TNSPs and other DNSPs, performance standards and compliance against those standards, and a summary of the DNSPs asset management methodology; and
- a summary of the DNSPs activities and actions taken to promote non-network initiatives, including embedded generation, and inform on any significant investments in metering services.

5.38 The MCE noted that these distribution annual planning reports could duplicate existing jurisdictional arrangements, but that the redundant jurisdiction arrangements should be phased out over time. However, the MCE did recognise there might be a continued need for jurisdictions to impose additional reporting and planning requirements.

5.39 An example of jurisdictional reporting is the Queensland requirement for the two DNSPs to prepare an annual network management plan detailing how they will manage and develop their networks to deliver an adequate, economic, reliable and safe electricity supply over the following five years.⁸⁴ These plans include:⁸⁵

- general information about the DNSPs supply network, and the operating environment including demand growth forecasts;
- an analysis of the historical reliability performance for the previous five year period;
- a statement of the reliability targets for the next five years and a description of major existing and planned reliability improvement programs, including details of major capital and operating and maintenance expenditure initiatives;
- statements on the DNSPs planning policy and asset management policy, and a qualitative assessment of compliance with those policies; and
- an evaluation of the distribution entity’s performance in the preceding financial year against the network management plan for that year, including its implementation of major capital and operating and maintenance expenditure initiatives.

Preliminary views

5.40 The Commission notes that the AEMC undertook an extensive review of current DNSP planning and reporting practices, including a comprehensive survey of DNSP reporting practices in the NEM. The purpose was to identify a consistent and comprehensive reporting framework that is fit for purpose. The AEMC concluded that the proposed DNSP reporting arrangements should:⁸⁶

The purpose of the DAPR is to inform on the outcomes of DNSPs’ planning processes under the national framework. The reports should provide an appropriate level of detail, and balance the potential benefits of providing the information with the potential costs of preparing the reports. They should provide sufficient information to allow

⁸⁴ Queensland Electricity Industry Code, s.2.3.

⁸⁵ Queensland Electricity Industry Code, s.2.3.2.

⁸⁶ Ibid, page 28.

non-network providers to identify potential investment opportunities that could be exploited through further dialogue with DNSPs.

Customers should be able to use the annual planning reports to optimise investments and promote efficient decision making. The reports should also assist stakeholders to identify and assess the possibility of establishing new connections at the most efficient location and assess the potential impact for upstream augmentations.

Regulators could also use the DAPR to develop their information requirements and understand the activities undertaken by DNSPs. An annual reporting process would provide regulators with updated information on a more frequent basis compared to, for example, a five-yearly basis under the regulatory control period. This would improve the level of information available across the industry, help overcome any information-asymmetries, and assist the AER's five-year revenue determination processes.

- 5.41 The Commission considers that adopting more comprehensive and specific network reporting requirements in the Territory would be beneficial, by establishing an effective and flexible reporting framework that provides investors, customers and the Commission with a comprehensive data set, and facilitating furthering harmonisation with NEM practices. More robust reporting arrangements would also assist in holding PWC Networks accountable for achieving relevant reliability and performance standards.

Question 12.

What additional matters do you consider need to be addressed to ensure the Territory's arrangements for assessing and reporting on electricity network adequacy are appropriate?

Fuel

- 5.42 Natural gas is the main fuel of electricity generation in the Territory, and in the Darwin-Katherine, Alice Springs and Tennant Creek power systems.
- 5.43 Gas from the Palm Valley and Mereenie fields in the Amadeus Basin in central Australia has been used as the main fuel for electricity generation in Alice Springs since 1983 and in the Darwin-Katherine and Tennant Creek systems since 1987. Gas is transported from central Australia to Darwin using the Amadeus Basin to Darwin gas pipeline, which has operated since January 1987. In January 2010, the Mereenie field ceased to supply gas.
- 5.44 The supply of gas has been very reliable, with only four occasions since 1987 when gas has not been supplied to a power station in the Darwin-Katherine system due to a pipeline or supply related problem.
- 5.45 The main source of gas since October 2009 has been the Blacktip field in the Bonaparte Gulf, about 100 km west of Wadeye. The gas is transported through the Bonaparte Gas Pipeline which joins the Amadeus Basin pipeline near Adelaide River. The Blacktip field is planned to be the main source of fuel for electricity generation until 2034. PWC also has a standby and backup source of gas via a short pipeline from the Darwin LNG plant at Wickham Point.

Preliminary views

- 5.46 The Commission has reported annually on the adequacy of fuel supplies for electricity generation in past power system reviews. A similar exercise is undertaken by AEMO for the NEM and South Australia and by the Western Australian Independent Market Operator for the south west interconnected system.
- 5.47 The Commission considers that assessing the adequacy of the source and supply of fuel for electricity generation in the Territory is warranted, given the importance of fuel availability to a reliable and secure electricity supply.

Question 13.

What additional matters do you consider need to be addressed to ensure the Territory's arrangements for assessing and reporting on the adequacy of the sources and supplies of fuel for electricity generation are adequate?

Performance and health

- 5.48 Reporting on the performance and health of the power system and components provides information about system performance trends, equipment capability relative to operating and security criteria, and if the electricity suppliers are managing their assets and delivering services as well as they might.
- 5.49 The Commission provides information on system performance and operational capacity through:
- the Standards of Service Performance report, providing information on reliability performance trends and quality of service; and
 - the Commission's annual report, providing information about compliance with regulatory obligations by industry participants.
- 5.50 The Commission intends expanding reporting on system performance and health by introducing new requirements for System Control to investigate and report on power system incidents, and placing an increased focus on technical compliance as part of the annual compliance reporting process. For example, the Commission requested System Control report on procedural compliance with the System Control Technical Code in 2009-10. The Commission expects this exercise to identify if System Control and system participants are doing the things necessary under the regulatory framework to maintain a secure and reliable power system.
- 5.51 Other examples of reporting on system performance and health include:
- the AEMO PSA, which reports on the forecast operational capacity of the NEM. In particular, the PSA examines the adequacy of ancillary services used to enable adequate control of power system frequency;⁸⁷

⁸⁷ AEMO, 2010 Power System Adequacy, June 2010, page 6.

- the AER reports quarterly on technical compliance by system participants with the National Electricity Rules. In particular, the AER has a technical compliance program, focusing on compliance with technical performance standards,⁸⁸ and
- the Tasmanian regulator reports on the reliability performance of the Tasmanian electricity supply industry and integrated power system. Reliability is defined as the probability of a system, device, plant or equipment performing its function adequately for the time intended under the operating conditions encountered.⁸⁹

Preliminary views

- 5.52 The Commission considers that reporting on performance and health, including the outcomes of investigations of compliance with technical performance standards would encourage and support the efforts of PWC Networks, generators and System Control to operate electricity infrastructure according to the standards required by relevant reliability and security criteria.
- 5.53 The Commission considers that the AER approach to auditing and reporting on technical compliance represents good industry practice, and intends adopting an equivalent framework and approach.
- 5.54 Additionally, the Commission has developed proposals for a future standards of service framework for the Territory.⁹⁰ The associated reporting arrangements are expected to provide more detailed and relevant information on network reliability performance trends.

Question 14.

What additional matters do you consider need to be addressed to ensure the Territory's arrangements for assessing and reporting on the performance and health of the Territory's power systems and distribution networks are adequate?

Development and coordination

- 5.55 Reporting on the development and planning of the power system and distribution network provides information to investors, other industry participants and customers about the future design and capacity of the power system and networks, which can be used to inform individual operating and investment decisions.
- 5.56 A lack of information about planning prevents the coordination of investment by generators, network operators and customers, which will certainly lead to inefficient investment outcomes. Infrastructure or equipment that is in the wrong place at the wrong time will cause customers to bear both financial and service related costs.

⁸⁸ For example, refer the AER, Quarterly Compliance Report July to September 2010, October 2010.

⁸⁹ Tasmanian Electricity Code, cl.12.8.1(a)

⁹⁰ Utilities Commission, Draft Report for the Review of Electricity Standards of Service, August 2010 available from http://www.nt.gov.au/nt/utilicom/publications/reports_publications.shtml. The Final Report was delivered to the Treasurer in November 2010, and is expected to be publicly available in December 2010.

- 5.57 The NTNDP is an example of a planning document produced to identify possible future scenarios for the efficient development of the transmission network and power system. The purpose is to provide information to assist existing and prospective investors to understand the current and future capability of the transmission network and the factors influencing new transmission investment.⁹¹
- 5.58 The reporting of projected generation adequacy and network plans also provides information that can be used by investors to understand system and network capability and the factors influencing new investment.

Preliminary views

- 5.59 The Commission considers that reporting should facilitate the development and the coordination of planning activities throughout the electricity supply chain. This would involve reporting of key information necessary for investors to make informed and timely investment decisions.

Question 15.

What additional matters do you consider need to be addressed to ensure the Territory's arrangements for reporting on system and network development and the coordination of planning activities in the Territory are appropriate?

⁹¹ AEMO, National Transmission Network Development Plan: Consultation Paper, January 2010, pages 1-3.

CHAPTER 6

Implementation

Requirements of the terms of reference

- 6.1 The terms of reference require the Commission to recommend a course of action and provide detailed plans for implementation of that recommendation.
- 6.2 The Commission will discuss implementation considerations in the Draft and Final reports.

APPENDIX A

Matters raised in Issues Paper

Question 1.

What additional matters do you believe need to be addressed to ensure that the Territory's regulatory framework establishes reliability and security standards for electricity generation, transmission and distribution that support effective investment outcomes?

Question 2.

What additional matters do you believe need to be addressed to provide certainty about that investment in generation capacity will be adequate to maintain reliability of supply?

Question 3.

What further or alternative regulatory arrangements would assist in achieving efficient and effective generation investment outcomes?

Question 4.

What further or alternative regulatory arrangements would assist in achieving efficient and effective distribution network investment outcomes?

Question 5.

What additional matters do you believe need to be addressed to ensure appropriate and effective monitoring of regulatory and technical compliance in the Territory?

Question 6.

What additional matters do you believe need to be addressed to ensure the existing regulatory arrangements and approach to testing equipment capability and performance in the Territory are adequate?

Question 7.

What additional comments do you have about the Commission's preliminary views on options for encouraging effective and appropriate testing of equipment capability and performance?

Question 8.

What additional matters do you believe need to be addressed to ensure effective incident reporting arrangements in the Territory?

Question 9.

What additional matters do you believe need addressing to ensure the regulatory arrangements and approach to measuring performance and reliability performance trends are adequate?

Question 10.

What additional matters do you believe need addressing to ensure that reporting arrangements and activities for the Territory are appropriate?

Question 11.

What additional matters do you consider need to be addressed to ensure the Territory's arrangements for assessing and reporting on system and generation adequacy are appropriate?

Question 12.

What additional matters do you consider need to be addressed to ensure the Territory's arrangements for assessing and reporting on electricity network adequacy are appropriate?

Question 13.

What additional matters do you consider need to be addressed to ensure the Territory's arrangements for assessing and reporting on the adequacy of the sources and supplies of fuel for electricity generation are adequate?

Question 14.

What additional matters do you consider need to be addressed to ensure the Territory's arrangements for assessing and reporting on the performance and health of the Territory's power systems and distribution networks are adequate?

Question 15.

What additional matters do you consider need to be addressed to ensure the Territory's arrangements for reporting on system and network development and the coordination of planning activities in the Territory are appropriate?