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# **REVIEW OF ELECTRICITY SYSTEM PLANNING, MONITORING AND REPORTING**

**FINAL REPORT**

*December 2011*



38 Cavenagh Street DARWIN NT 0800  
Postal Address GPO Box 915 DARWIN NT 0801  
Email: [utilities.commission@nt.gov.au](mailto:utilities.commission@nt.gov.au)  
Website: [www.utilicom.nt.gov.au](http://www.utilicom.nt.gov.au)

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# CHAPTER 1

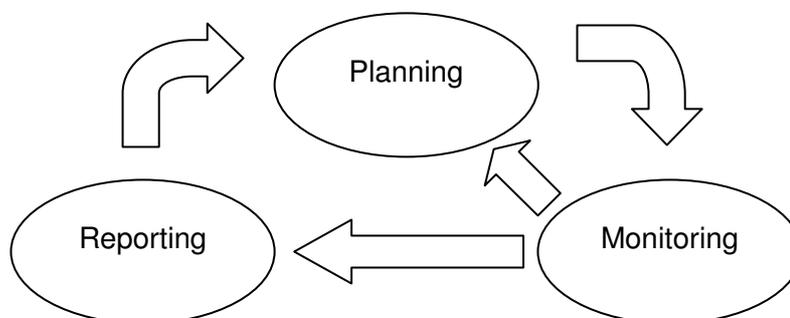
## Executive Summary

- 1.1 The Commission has undertaken a review on the adequacy of current performance monitoring and reporting arrangements under the *Electricity Reform Act*. The objective of this review is to recommend a course of action that ensures that planning, monitoring and reporting promote acceptable performance outcomes.
  - 1.2 The review has been conducted according to terms of reference provided by the Treasurer in November 2009 to assess the effectiveness of existing planning, monitoring and reporting arrangements for the Northern Territory electricity systems, and identify options for ensuring that planning, monitoring and reporting facilitate system performance that is consistent with applicable service standards.
  - 1.3 The Treasurer provided the Commission with a terms of reference to consider:
    - the relationship between performance, planning decisions, capital and maintenance programs and applicable standards of service;
    - 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 Australian Energy Regulator (AER) State of the Market report and the Australian Energy Market Operator (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.
  - 1.4 The Commission was to recommend an efficient and effective course of action and provide detailed plans for the implementation of that recommendation.
  - 1.5 The Commission initiated this review in December 2010 with the release of an Issues Paper. The Commission released a Draft Report on 5 August 2011 for consultation. Submissions were made by Power and Water Corporation (PWC), Energy Supply Association of Australia (ESAA), QEnergy Limited (QEnergy) and Northern Territory Major Energy Users Group (NTMEU). These submissions informed the development of the final recommendations in this report.
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## Planning, monitoring and reporting

- 1.6 Planning, monitoring and reporting are an inter-related set of activities for managing the current and future performance of electricity supply infrastructure to achieve price, quality, safety, reliability and security of supply outcomes that are in the long term interests of customers. The underpinning elements of the planning, monitoring and reporting activities are summarised as follows:
- planning identifies the electricity supply infrastructure investments needed to achieve the price and reliability of supply levels established through the regulatory bargain;<sup>1</sup>
  - monitoring activities will confirm the reliability performance achieved against the accepted targets; and
  - reporting provides authoritative data on the reliability performance of the electricity supply chain and component assets which may be used to hold the supplier accountable against the regulatory bargain, inform future planning decisions and potentially revise reliability targets to suit a nominated price and revenue level.
- 1.7 A coordinated framework of planning, monitoring and reporting will support an electricity supply that meets the service level and price level expectations of the regulatory bargain by establishing a virtuous circle of decision making, constant evaluation, information dissemination and accountability. Figure 1.1 shows the relationship between planning, monitoring and reporting.

**Figure 1.1: Relationship between planning, monitoring and reporting**



- 1.8 Effective planning, monitoring and reporting arrangements will support the regulatory bargain.
- 1.9 A clearly documented and rigorously followed planning, monitoring and reporting framework is important to provide appropriate levels of accountability and visibility of reliability and price outcomes. If planning decisions are consistent with achieving reliability targets, then those planning decisions should be confirmed by independent oversight (e.g. the economic regulator) and will support revenue claims.

<sup>1</sup> The regulatory bargain is an optimisation of the price, service and risk relationship between the supplier and customers so that service performance is maintained according to customer needs, and that customers pay a fair price for that level of service. Refer Energy Networks Association, Service Standard and Regulatory Policy and National Reliability Reporting Framework, March 2007; and Essential Services Commission of South Australia, Distribution Service Standards 2010-12 Final Decision, November 2008, pages 7-8.

## Final recommendations

### System planning

#### *Final recommendation 1(a) – Planning instruments*

- 1.10 The Commission recommends the development and implementation of planning instruments that are consistent with the purpose and characteristics of the national electricity market (NEM) planning instruments, including the following key components:
- credible and dependable forecasts of future electricity demand and supply to identify possible future generation and transmission capacity constraints;
  - assessments of system adequacy, taking account of maintenance and outage plans;
  - clearly defined security and reliability standards that reflect the customer price and service level outcomes of the regulatory bargain; and
  - authoritative data on the current and future condition of infrastructure to inform decisions about the most economic future options for augmentation and expansion of infrastructure to maintain security and reliability standards across the supply chain on a cost effective basis.
- 1.11 This planning information should be updated regularly to provide a program of information collection, analysis and disclosure of power system security and reliability of supply prospects.
- 1.12 The Commission recommends the introduction and use of Regulatory Investment Tests for Transmission (RIT-T) as part of system planning to ensure that system developments are subject to a cost-effectiveness evaluation.

#### *Final recommendation 1(b) – Clearly defined power system reliability standards and performance targets*

- 1.13 The Commission recommends the development and application of clearly defined power system (generation and transmission) reliability standards and performance targets to support system planning.

#### *Final recommendation 1(c) – Safety net arrangements*

- 1.14 The Commission recommends the development of a regulatory mechanism for the procuring of ancillary services (i.e. frequency and voltage control services) that include generator of last resort services and determining who is responsible for the provision of those services.

### System monitoring

#### *Final recommendation 2(a) – Monitoring of compliance*

- 1.15 The Commission recommends that all electricity entities be required to develop and maintain a robust compliance process for the power system (generation and transmission).

#### *Final recommendation 2(b) – Monitoring of power system incidents*

- 1.16 The Commission recommends the implementation of a mechanism requiring the investigation of relevant power system incidents. The Commission is working with the
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System Controller to incorporate an incident investigation and reporting framework in the System Control Technical Code.

*Final recommendation 2(c) – Development of process for oversight and review of technical obligations and parameters*

1.17 The Commission recommends the development of a clear process for oversight and regular review of the technical obligations and parameters for the power system established through the regulatory framework. The opportunity exists to implement this recommendation when an Electricity Industry Code is developed.

## **System reporting**

*Final recommendation 3(a) – Power system reporting consistent with the NEM*

1.18 The Commission recommends the development and implementation of a framework for the reporting of comprehensive and authoritative power system information. This information would support system reliability performance that is consistent with the reliability and price expectations of the regulatory bargain. Information that should be reported includes:

- system planning information, including demand forecasts, the adequacy of system capacity relative to forecast demand, adequacy of fuel supplies and other major security risks, and knowledge of planning and investment commitments;
- health of the system information, including system performance trends, regulatory and technical compliance and the findings of investigations into power system incidents; and
- reliability outcomes experienced by customers.

1.19 The Commission recommends that the system reporting framework involve, where applicable, a similar suite of instruments or reports to those in the NEM. The scope and content of these instruments could be informed by the National Electricity Rules.

*Final recommendation 3(b) – Independence of power system reporting*

1.20 The Commission recommends that the system reporting framework ensure appropriate independence in the preparation of reporting instruments. To ensure that system reporting is both comprehensive and accurate, parties should be held accountable for the information reported, for example by requiring the responsible entity to certify that the material presented is accurate (on a best endeavours basis).

1.21 The system data reported should be subject to oversight by an appropriate body (e.g. the Commission) to confirm that assumptions and forecasts are reasonable.

## **Distribution network planning**

*Final recommendation 4(a) – Routine publication of network planning data*

1.22 The Commission recommends the development and implementation of distribution network planning instruments that are consistent with the purpose and characteristics of the annual planning instruments required of electricity distribution network service providers (DNSPs) in the NEM. The key components of these instruments would be:

- credible and dependable forecasts of future electricity demand and supply to identify possible future sub-transmission and distribution network capacity constraints;
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- based on clearly defined security and reliability standards that reflect the customer price and service level outcomes of the regulatory bargain; and
- authoritative data on the current and future capability and condition of infrastructure to inform decisions about the most economic future options for augmentation and expansion of infrastructure to maintain security and reliability standards across the supply chain on a cost effective basis.

1.23 This distribution planning information should be updated regularly to provide a program of information collection, analysis and disclosure of power system security and reliability of supply prospects.

*Final recommendation 4(b) – Development and application of clearly defined distribution network reliability standards and performance targets*

1.24 The Commission recommends the development and application of clearly defined distribution network reliability standards and performance targets to support network planning.

1.25 Reliability and security of supply standards and planning criteria should be regularly reviewed to ensure that planning criteria reflect the desired reliability and price outcomes.

1.26 The Commission recommends the introduction and use of Regulatory Investment Tests for Distribution (RIT-D) as part of distribution planning to ensure that distribution network developments are subject to a cost-effectiveness evaluation.

### **Distribution network monitoring**

*Final recommendation 5(a) – Development of compliance process*

1.27 The Commission recommends that the DNSP continue efforts to develop and maintain a robust compliance process.

*Final recommendation 5(b) – Development of incident reporting arrangements*

1.28 The Commission recommends the implementation of a mechanism for the investigation of relevant distribution network incidents. The Commission is working with the System Controller to incorporate an incident investigation and reporting framework in the System Control Technical Code.

*Final recommendation 5(c) – Review and reporting on compliance with technical obligations and parameters*

1.29 The Commission recommends a review of the processes and triggers for oversight and review of the technical obligations and parameters for the distribution network established through the regulatory framework (i.e. the Network Connection Technical Code).

### **Distribution network reporting**

*Final recommendation 6(a) – Development of framework for the reporting of comprehensive distribution network information*

1.30 The Commission recommends the development and implementation of a framework for reporting of comprehensive and authoritative distribution network information. Information to be reported should include:

- a network planning and performance report, with the contents consistent with the purpose and characteristics of national arrangements; and
- reliability outcomes experienced by customers.

1.31 The Commission considers that the national network reporting requirements (the national annual planning reports and AER network performance reports) could provide a sound basis for arrangements in the Territory.

*Final recommendation 6(b) – Independence in preparing reports*

1.32 The Commission recommends that the reporting framework ensure appropriate independence and accountability in the preparation of reporting instruments. The purpose is to highlight the importance attached to the dissemination of accurate network planning and performance data.

## **Implementation considerations**

1.33 The terms of reference require the Commission to recommend a course of action and provide detailed plans for implementation of that recommendation.

1.34 The options for implementing the Commission's recommendations include:

- establishing a planning, monitoring and reporting framework using existing heads of power, such as those contained in the *Electricity Reform Act, s45*, and potentially the existing heads of power for a standards of service framework; and
- introducing the proposed arrangements through an Electricity Industry Code requiring the development of a planning, monitoring and reporting framework consistent with the Commission's recommendations.

1.35 Arrangements of this nature are probably more appropriately established through explicit and specific instruments. This approach would reflect the policy intent of the regulatory framework, and would create more certainty about the form and nature of the arrangements.

1.36 The Commission notes that an implementation group comprising representatives of industry, policy and regulatory entities has been formed to progress the implementation of the Commission's reviews as part of the Government's priority work program. A detailed course of action for implementation is being developed by Northern Territory Treasury in conjunction with the Commission.

1.37 It is expected that the first meeting of the implementation group will take place in February 2012.

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## CHAPTER 2

### 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;
  - 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 business in the market systems, generating the majority of electricity used, operating the electricity networks and supplying retail services. PWC is also a major electricity supplier 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 Northern Territory government owned corporation with generation, network and retail business units operating as separate businesses.<sup>2</sup> The commercial relationship and transactions between each unit are subject to oversight and regulation by the Commission.<sup>3</sup> PWC is also subject to oversight by a shareholding Minister (currently the Treasurer) and a portfolio Minister (currently the Minister for Essential Services).
- 2.5 PWC has been the only electricity retailer operating in the Territory in recent years, supplying electricity to 76 603 customers at 30 June 2011.<sup>4</sup>
- 2.6 The Commission granted a standard electricity retail licence to QEnergy Ltd (QEnergy) in February 2011.
- 2.7 PWC is the main electricity generator, with about 89 per cent of generation capacity in the market systems. There are four other generators producing electricity in the Darwin-Katherine and Alice Springs systems. However, these businesses generate

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<sup>2</sup> This paper refers to the separate business units as PWC Retail, PWC Networks and PWC Generation.

<sup>3</sup> Regulatory instruments include the licensing framework and the Northern Territory Electricity Ring-Fencing Code.

<sup>4</sup> Power and Water Corporation Annual Report 2010-11.

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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.<sup>5</sup>

- 2.8 PWC Networks owns and operates the Darwin-Katherine, Alice Springs and Tennant Creek electricity networks, which comprise 709 kilometres (km) of transmission lines and 7650 km of distribution lines.<sup>6</sup>
- 2.9 The System Control function is undertaken by PWC. The System Controller has statutory responsibilities for monitoring and controlling the operation of the power systems to ensure the system and distribution network operates reliably, safely and securely in accordance with the System Control Technical Code.
- 2.10 Electricity supply in regional and remote centres of the Territory is managed through a contract for service model, with 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.<sup>7</sup>

## **Planning, monitoring and reporting**

- 2.11 Planning, monitoring and reporting are an inter-related set of activities for managing the current and future performance of electricity supply infrastructure to achieve the price, quality, safety, reliability and security of supply outcomes that are in the long term interests of customers.<sup>8</sup>
- 2.12 Planning should identify the investments needed to deliver a certain level of service for a certain cost and price – this is known as the service/price contract or regulatory bargain. Monitoring activities are to confirm the performance achieved against targets established through the regulatory bargain. Reporting provides feedback to electricity businesses, regulators, governments and the community on performance and planning decisions, and informs future planning decisions.
- 2.13 The concept of the regulatory bargain is often applied to electricity networks, but is equally applicable where a firm or industry sector has monopoly power and measures are in place to ensure that incentives that drive capital efficiency do not lead to a reduction in service performance. Effectively, the regulatory bargain involves an optimisation of the price, service and risk relationship between the supplier and

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<sup>5</sup> Utilities Commission, March 2011, 2009-10 Power System Review, pages 14-15. These generators are located at Pine Creek (between Darwin and Katherine), Shoal Bay (the Darwin City Council waste facility) and Brewer Estate (in Alice Springs).

<sup>6</sup> Power and Water Corporation Annual Report 2010-11.

<sup>7</sup> 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.

<sup>8</sup> This purpose is consistent with the objects of the Electricity Reform Act [s3] and the National Electricity Objective [s7].

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customers so that acceptable service performance are maintained according to customer needs, and that customers pay a fair price for that level of service.<sup>9</sup>

- 2.14 In a non-competition environment, the regulatory bargain and accountability are critical to service and price outcomes. A coordinated planning, monitoring and reporting framework will assist in making electricity businesses accountable for performance and price outcomes by establishing a clear relationship between planning decisions and performance outcomes. Further, the feedback loop provides the authoritative data needed to revise performance targets to suit a particular price and revenue level. If the planning outcome appears consistent with achieving the service targets, then the planning decisions should be supported by independent oversight (i.e. the regulator) and will support revenue claims.
- 2.15 Although planning, monitoring and reporting activities have the common purpose of achieving a safe, reliable, secure and cost effective electricity supply in each part of the electricity supply chain, there is a separate focus and approach taken for:
- the power system – generation and transmission networks, which perform the functions of production and transport of bulk electricity from the generator to the distribution network; and
  - the distribution network, which performs the function of transporting the bulk electricity to individual customers.
- 2.16 This distinction has evolved due to the differing operating characteristics and priorities of the power system and distribution network. For example, maintaining reliability is more critical for the power system than for the distribution network because poor system reliability has the potential to affect significantly more customers, at a significantly greater cost. This review distinguishes between the power system and distribution network.

## **Purpose of the review**

- 2.17 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.
- 2.18 The objective of this review is to recommend a course of action that ensures that planning, monitoring and reporting promote acceptable performance outcomes.
- 2.19 The Commission was requested by the Treasurer 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.

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<sup>9</sup> Energy Networks Association, ENA Service Standard and Regulatory Policy and National Reliability Reporting Framework, March 2007; and Essential Services Commission of South Australia, South Australian Distribution Service Standards 2010-12 Final Decision, November 2008, pages 7-8.

## Issues Paper and submissions

- 2.20 The Commission initiated this review in December 2010 by releasing an Issues Paper seeking comments from interested parties on the options and considerations for power system and distribution network planning, monitoring and reporting arrangements.
- 2.21 The Issues Paper surveyed planning, monitoring and reporting arrangements in the NEM and Territory, and provided the Commission's preliminary thinking on a possible future approach for the Territory.
- 2.22 The Northern Territory Major Energy Users (NTMEU) provided a submission addressing matters raised in the Issues Paper and outlining matters of concern to NTMEU members. In brief the NTMEU submission:
- supported the focus on planning, monitoring and reporting and considered that the Issues Paper identified many of the key elements of a successful planning, monitoring and reporting program;
  - noted that the Issues Paper used the NEM model as a template for good practice, but cautioned that the NEM was a work in progress and did not yet represent world best practice;
  - questioned whether the industry structure in the Territory adequately reinforced incentives for reliable and cost effective service delivery and suggested PWC did not have adequate incentive to embed the controls and processes that have now become the norm in the NEM, such as condition monitoring and preventative maintenance practices; and
  - considered that an essential aspect of PWC processes must be towards looking at reliability of supply from the perspective of consumers, rather than seen as purely supply side issues.
- 2.23 The PWC submission provided comments on the themes of planning, monitoring and reporting raised in the Issues Paper. In summary, the PWC submission anticipated that any recommendations or revised approaches would be focused on benefits to electricity consumers rather than having data sets, reports and regulatory obligations some with overlapping information and requirements. PWC noted that an appropriate balance also needed to be achieved between the required investments and funding levels.

## Draft Report and submissions

- 2.24 The Commission released a Draft Report in August 2011. The Commission received submissions from NTMEU, QEnergy, the Energy Supply Association of Australia (ESAA) and PWC.
- 2.25 NTMEU referred to the comments it had previously made on the Issues Paper and looked forward to seeing the outcomes of the reports.
- 2.26 QEnergy supported the Commission's recommendations. It shared the Commission's view that the benefits associated with the recommendations exceed the costs in ensuring a well run, transparent and competitive electricity market in the Territory.
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- 2.27 PWC informed the Commission that it was in the process of implementing many aspects of the Commission's recommendations in the Draft Report as a result of the findings from other reviews conducted by the Commission. PWC expressed some concern that the Commission had not adequately costed its recommendations. PWC was of the view that the experience elsewhere in Australia could not be translated directly to the Territory.
- 2.28 ESAA noted that the latest two reviews conducted by the Commission continued to pursue the overall approach to more closely align the Territory arrangements with the NEM. While supportive of the national regulatory framework where practicable, ESAA submitted that the cost of the Commission's recommendations needed to be considered relative to the benefits. ESAA acknowledged that quantifying the costs and benefits of specific changes was difficult given inherent uncertainties. However, the Commission could do more to put some boundaries around the likely range of gains that may be possible from the recommended reforms and the likely costs.
- 2.29 In response to PWC and ESAA's comments, the Commission notes that the electricity supply industry is a key input to the future development of the Territory. It is vital to ensure that the industry delivers the services required by consumers at prices that reflect efficient costs. Significant reform of the industry will be required to achieve this goal, and as a consequence the Territory Government has initiated a program of reforms.
- 2.30 A key principle of the reform program is to support greater competition in the industry, and this is consistent with the Government's commitment to the National Competition Policy Agreement in 1995. Furthermore, the NEM provides an important model for electricity industry reform in the Territory. The Commission considers that the adoption of a NEM approach, where relevant, with respect to planning, monitoring and reporting will support better asset management practices, optimal investment decisions and provision of transparent, reliable and relevant information to existing and prospective market participants.

## **Purpose of this Final Report**

- 2.31 This Final Report sets out the Commission's recommendations for system and distribution planning, monitoring and reporting arrangements in the Territory, and discusses implementation considerations.
- 2.32 This Final Report is structured as follows:
- Chapter Three deals with planning, monitoring and reporting for the power system;
  - Chapter Four deals with planning, monitoring and reporting for the distribution network; and
  - Chapter Five deals with implementation considerations.

## **Review of Electricity System Planning and Market Operation Roles and Structures**

- 2.33 The Commission has separate terms of reference from the Treasurer to review and report on the efficiency of system planning and market operation arrangements to identify a course of action that ensures the allocation of functions to do with system
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planning and market operation promote efficient and reliable electricity system performance.

- 2.34 A Final Report for the Review of Electricity System Planning and Market Operation Roles and Structures has been released together with this paper. This will allow an effective and broad understanding of the allocation of the functions and responsibilities associated with system planning and market operation.
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## CHAPTER 3

### Power system – planning, monitoring and reporting

- 3.1 The power system comprises the generation facilities and transmission network infrastructure for producing electricity and delivering that electricity to the distribution network.

#### Power system planning

- 3.2 Power system planning involves identifying a credible future view of system demand and supply to guide decisions about managing and developing system infrastructure so as to deliver a safe supply of bulk electricity that meets reliability, security and quality standards at the lowest long term cost.
- 3.3 Planning activities should support the identification and coordination of the most economic future investments for augmentation and expansion generation and transmission capacity to meet expected customer demand and maintain reliability on a cost effective basis.

#### System planning practices

- 3.4 System 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 with the forecast future demand, and to assist identification of generation and transmission network infrastructure investment opportunities.
- 3.5 System demand is determined by household, business and industrial electricity consumption patterns, which are influenced by weather, population growth and household formation, economic growth, the development of energy intensive industrial projects and demand management initiatives.
- 3.6 The purpose of a system demand forecast is to identify expectations of maximum or 'peak' demand. Forecasts of peak demand are used to inform decisions about system capacity (sometimes known as the supply-demand balance) and the management of the power system to ensure a reliable and secure electricity supply.
- 3.7 AEMO is responsible for coordinating system planning in the NEM, using a suite of instruments to help guide targeted investment and the future development of Australia's electricity infrastructure and resources. In particular, AEMO prepares independent modelling and advice on strategic planning and credible future electricity demand and supply scenarios for the NEM, including developing peak demand forecasts.
- 3.8 These forecasts inform decisions about the generation capacity operating and in reserve that must be available in the next half hour and over the day (i.e. operational decisions) and may be needed to meet future electricity demand (i.e. decisions about maintenance scheduling and potential new investment opportunities).
- 3.9 The key characteristics of system planning instruments and the approach to system planning for the NEM are:
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- providing data to support the identification of the most economic future options for augmentation and expansion of infrastructure to maintain security and reliability standards on a cost effective basis;
- a focus on identifying the possible future generation and transmission capacity constraints given defined security and reliability standards, rather than directing an investment in a specific project;
- a top down and coordinated approach across the power system and industry participants to developing credible and dependable forecasts of future supply and demand conditions. The involvement of an impartial and expert body in developing forecasts is the accepted way of giving forecasts the required authority. System demand forecasts are critical to planning;
- integration with the management of existing infrastructure assets. There needs to be across-the-board confidence that existing assets will deliver the advertised reliability outcomes; and
- coordination of planning activities across the supply chain – no one business can have a complete knowledge of possible future investment actions (those influencing supply) or of customer demand and, in particular, the location, time profile and growth rate of future demand.

3.10 Electricity businesses require demand forecasts to inform operational and investment decisions, making robust demand forecasts a critical requirement for system planning. The development of robust demand forecasts is a complex and technically challenging task.

3.11 Based on good industry practice, some of the elements common to forecasting electricity demand are:

- bottom up – top down reconciliation of forecasts, which involves reconciling distribution network, transmission network and system forecasts;
- weather corrected data, which establishes the temperature sensitivity of electricity demand to account for variability in annual peak demand and energy use due to increased prevalence of temperature dependent equipment (e.g. air conditioners);
- production of probability of exceedance (PoE) 50 per cent and PoE 10 per cent forecasts, which is a statistical approach for stress testing the system infrastructure capability to meet peak demand in a one in two year weather scenario (50 per cent POE) and one in 10 year weather scenario (10 per cent POE);
- combination of econometric forecasts and trend analysis, which involves developing demand forecasts using an econometric model that includes assumptions about factors affecting electricity demand and use (e.g. population growth, housing activity, gross state product, air conditioner penetration and energy efficiency). The modelling results are then usually reconciled against an analysis of historical demand trends;
- identifying spot loads. Major spot loads (i.e. energy intensive industry projects) have a significant impact on network forecasts, and some impact on system forecasts. Industry practice is for communication between network operators and planners to recognise the certainty and timing of major loads, and to use a contingent project approach when forecasting;

- combinations of internal and external expertise. Industry practice is to use both in house expertise (especially at a network level) and external expertise (especially at a system level) to develop an integrated forecast with a level of independence;
- common forecasts for capital and revenue budgeting. A common set of forecasts is applied to capital expenditure programs and determining required revenues; and
- changes in load shape – system load factor. A change to the system load profile and load factor can influence generation utilisation, which can have longer term impacts on electricity demand.

#### *Projected assessment of system adequacy*

- 3.12 A projected assessment of system adequacy (PASA) is the term for the comprehensive program of information collection, analysis and disclosure of medium term and short term power system security and reliability of supply prospects in the NEM.<sup>10</sup> AEMO uses the short and medium term PASA to ensure that adequate levels of reserve are in the system at all times, and by generators and transmission network service providers (TNSPs) to plan augmentation, maintenance and other outages up to 2 years in advance.<sup>11</sup>
- 3.13 Producing a PASA gives industry participants regular data about the supply-demand balance, taking into account dynamic factors such as generation plant maintenance schedules. The PASA is a continuous flow of information that is primarily used to guide operating decisions, but also can support planning activities. In particular, the PASA provides a mechanism for tracking the system supply-demand balance against forecasts.

#### *Regulatory test*

- 3.14 Economic regulation practice involves external oversight and involvement of transmission planning through the transmission network price determination process, or a regulatory investment test (referred to as the RIT-T for transmission network projects).
- 3.15 In response to the Issues Paper, the NTMEU considered that the introduction of a regulatory investment test for network assets in the Territory, together with a public assessment of the need for new investment, would provide a strong basis for limiting otherwise unfettered capital expenditure by a network provider.<sup>12</sup>
- 3.16 The RIT is part of an assurance that options for major developments are properly considered. The test is essentially a cost-effectiveness test to ensure that the least cost option is selected for implementation, after considering demand forecasts, operating risks and development alternatives including demand management.
- 3.17 The five yearly assessments by the Commission of the PWC Networks' capital base and proposed capital and maintenance programs (part of the network price determination process) provides oversight of investment levels relative to reliability performance. This assessment may take account of the application of the RIT in accepting project expenditure for inclusion in the regulated asset base.

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<sup>10</sup> National Electricity Rules 3.7.1

<sup>11</sup> Australian Energy Market Operator, July 2010, An Introduction to Australia's National Electricity Market, page 17.

<sup>12</sup> Northern Territory Major Energy Users, January 2011, Submission to the Issues Paper on the Review of Electricity System Planning, Monitoring and Reporting, page 18.

## Effectiveness of Territory system planning

3.18 The annual Power System Review is the nearest Territory equivalent to the planning instruments used in the NEM, providing information on the adequacy and performance which might be used to guide investment and operation decisions in the Territory's power systems.<sup>13</sup> Key components of the Power System Review are demand forecasts and estimates of future available generation capacity.

### *Demand forecasts*

3.19 The purpose of the demand forecasts published by the Commission for the Power System Review is to advise the electricity industry and community of future electricity demand and capacity scenarios. The Commission relies on forecasts and data held by electricity supply industry participants (that is, PWC).

3.20 Practice elsewhere in Australia is for system demand forecasts to be developed by an independent market and system operator based on the data held by multiple generators, TNSPs, DNSPs and retailers. As a vertically integrated electricity business and the sole market participant, PWC has been in a unique situation for Australia by having access to comprehensive information on historical and prospective peak demand and energy consumption. This situation makes PWC the party best able to develop demand forecasts.

3.21 For the 2009-10 Power System Review, the Commission obtained expert advice to determine if PWC's system demand forecasts for the Darwin-Katherine, Alice Springs and Tennant Creek systems were suitable for planning purposes. The review observed that:<sup>14</sup>

*... PWC system demand forecasts for the purposes of testing system adequacy for the period 2010-11 to 2019-20 are probably too low. However, a conclusive opinion of system demand growth over the period requires a comprehensive analysis using the elements common to the preparation of robust demand forecasts.*

3.22 The Commission identified a number of areas for continuous improvement to PWC's forecasts. The Commission expects that PWC will in the future develop a consolidated system demand forecast that is sufficiently robust for system planning purposes, including accurately assessing the supply-demand balance.

3.23 The Commission notes that PWC is working to improve its forecasting capabilities, including considering adopting practices common to robust electricity forecasting such as weather correction, econometric modelling and external validation where these capabilities are appropriate and cost effective.<sup>15</sup>

### *Reliability and security standards*

3.24 For system planning to provide an adequate foundation for the routine delivery of reliable and cost effective electricity services, there needs to be a clearly defined target reliability standard that relates to the reliability experienced by customers.

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<sup>13</sup> The annual power system review is prepared under *Electricity Reform Act*, s45.

<sup>14</sup> Utilities Commission, 2009-10 Power System Review, page 21.

<sup>15</sup> Power and Water Corporation, submission to Issues Paper, page 3.

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- 3.25 The Territory's regulatory framework does not clearly specify a mechanism for identifying and applying a reliability standard for the power system. This effectively gives significant discretion to system planners about the target level of reliability and associated infrastructure investment, which makes it difficult to hold industry participants accountable for the cost and reliability of supply.
- 3.26 The need to address the lack of a reliability standard set as part of the regulatory bargain was recognised in the Commission's Review of Electricity Standards of Service which proposed that a reliability target be established to identify a maximum level of unserved energy (USE)<sup>16</sup> for the power systems, representing the statistical risk of the electricity supply not meeting customer demand over time.<sup>17</sup>
- 3.27 System planning requires a reliability standard or target to provide the basis for assessing infrastructure adequacy and reliability of supply prospects, and for guiding the investment response needed to meet customer expectations of service performance and cost.
- 3.28 In its submission on the Commission's Issues Paper, the NTMEU agreed that specific standards of performance are necessary, whether they are related to generation or networks and such standards need to be set in relation to what customers see, such as unserved energy and individual feeder performance. NTMEU advised that these types of standards have relevance to customers and would allow industry participants to make informed choices about balancing cost to reliability.<sup>18</sup>
- 3.29 In the NEM, under the provisions of the Reliability Standard, each region's annual USE can be no more than 0.002 per cent of its annual energy consumption. Compliance is assessed by comparing the 10-year moving average annual USE for each region with the Reliability Standard.<sup>19</sup>
- 3.30 Generators and AEMO use the Reliability Standard as the benchmark or threshold for identifying a need for new generation capacity. Effectively, the Reliability Standard represents the reliability target that needs to be achieved, without specifying a particular investment outcome or make up of the generation fleet.
- 3.31 In its submission to the Issues Paper, PWC noted that regulation of service performance already occurs through annual Standards of Service reporting, while the annual Power System Review should identify any gaps in generation investment and when new capacity is required.<sup>20</sup>
- 3.32 It should be noted that the existing standard of service framework does not explicitly link reliability performance to a reliability standard, which limits its usefulness as a basis for system planning and the identification of optimal investment decisions.

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<sup>16</sup> Unserved energy (USE) is the amount of energy that cannot be supplied because there is insufficient generation capacity, demand side participation or network capability to meet demand.

<sup>17</sup> Utilities Commission, Final Report: Review of Electricity Standards of Service for the Northern Territory, November 2010, page 3.

<sup>18</sup> Northern Territory Major Energy Users, January 2011, Submission to the Issues Paper on the Review of Electricity System Planning, Monitoring and Reporting, page 15.

<sup>19</sup> National Electricity Rules 3.9.3A

<sup>20</sup> Power and Water Corporation, January 2011, Submission to the Issues Paper on the Review of Electricity System Planning, Monitoring and Reporting, page 3.

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- 3.33 The lack of a clear reliability standard limits the ability of the Power System Review to assess potential gaps in generation investment and the need for new investment due to the potential for differing judgements by the Commission and PWC (or other generator) about what level of capacity (and the resulting reliability performance) is appropriate.
- 3.34 The implementation of system wide reliability standards and targets is being considered by the Commission as part of the development of a new standards of service framework.

*Business decision making*

- 3.35 System planning involves the coordinated provision of comprehensive information on current and future system conditions under specified reliability standards and performance expectations. This should be a primary source of information for decision making by industry participants.
- 3.36 In response to the Issues Paper, PWC suggested that if the Commission (or presumably any other party) were to take a greater role in generation investment, this would conflict with the current responsibilities of the PWC Board and management.<sup>21</sup> PWC investment decisions are the responsibility of the Board and management, and would be informed by the need to meet defined reliability standards and other regulatory obligations.
- 3.37 In the Draft Report, the Commission noted that a commercial business such as PWC made decisions to maximise shareholder returns whereas system planning should reflect the long term interests of customers. Therefore, the decisions of the PWC Board and management, and the long term interests of customers, may not align. The system planning framework and associated instruments should balance these commercial and public interests, including by establishing clear performance objectives that can be used to hold industry participants accountable for their investment decisions.<sup>22</sup>

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<sup>21</sup> Power and Water Corporation, January 2011, Submission to the Issues Paper on the Review of Electricity System Planning, Monitoring and Reporting, page 3.

<sup>22</sup> Utilities Commission, August 2011, Review of Electricity System Planning, Monitoring and Reporting – Draft Report, page 19.

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### *Safety net arrangements*

- 3.38 There is no obligation on generators in the Territory or in the NEM to invest in new capacity simply because a shortfall is forecast. The expectation in the NEM is that a capacity shortfall will push up wholesale energy prices, thereby attracting new investment. Notwithstanding this, AEMO has a responsibility to ensure adequate generation capacity is available, and may contract for reserves if a generation capacity shortfall is forecast and there is no response evident by the market.<sup>23</sup>
- 3.39 The Territory does not operate an equivalent market system, and the regulatory framework is silent on who might be the generator of last resort. 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 (e.g. Weddell, Channel Island and Owen Springs power stations).
- 3.40 The benefit of clarifying responsibility for being generator of last resort is greater certainty that investment in generation capacity will be adequate to maintain reliability of supply on a cost effective basis.
- 3.41 A safety net arrangement would be supported by effective system planning instruments. The NTMEU submission on the Issues Paper pointed out that if PWC Generation or other party (such as PWC System Control) were required to prepare and publish short and medium PASA and/or a statement of opportunities then this would provide long term advice to generation providers of the potential for investment in generation.<sup>24</sup>

### **Draft recommendations – system planning**

- 3.42 In the Draft Report, the Commission made three preliminary recommendations regarding system planning in the Territory.

#### *Draft recommendation 1(a) – Planning instruments*

- 3.43 The Commission recommended the development and implementation of planning instruments that are consistent with the purpose and characteristics of the NEM planning instruments released by AEMO. The key components of these instruments are:
- credible and dependable forecasts of future electricity demand and supply to identify possible future generation and transmission capacity constraints;
  - assessments of system adequacy, taking account of maintenance and outage plans;
  - based on clearly defined security and reliability standards that reflect the customer price and service level outcomes of the regulatory bargain; and
  - authoritative data on the current and future capability and condition of infrastructure to inform decisions about the most economic future options for augmentation and expansion of infrastructure to maintain security and reliability standards across the supply chain on a cost effective basis.

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<sup>23</sup> National Electricity Rules 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.

<sup>24</sup> Northern Territory Major Energy Users, January 2011, Submission to the Issues Paper on the Review of Electricity System Planning, Monitoring and Reporting, page 17.

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3.44 This planning information should be updated regularly to provide a program of information collection, analysis and disclosure of power system security and reliability of supply prospects. The NEM approach appears appropriate, with an annual and comprehensive update of longer term demand forecasts and supply prospects, and supported by a more regular update of the shorter term supply-demand balance (i.e. a medium term PASA document).

*Draft recommendation 1(b) – Clearly defined power system reliability standards and performance targets*

3.45 The Commission recommended the development and application of clearly defined power system (generation and transmission) reliability standards and performance targets to support system planning.

3.46 The Commission’s Review of Electricity Standards of Service proposed that reliability performance outcomes be established for generation, transmission and distribution networks, including establishing a Territory Reliability Standard (based on a certain level of unserved energy) and network feeder reliability targets.

*Draft recommendation 1(c) – Safety net arrangements*

3.47 The Commission recommended the development of a regulatory mechanism for procuring ancillary services (generator of last resort services), and determining who is responsible for being the generator of last resort.

## **Views in submissions**

*Comments regarding draft recommendation 1(a) – Planning instruments*

3.48 In its submission, PWC advised the Commission that it had started developing forecasts of future electricity demand and supply in accordance with recommendations from the Commission’s technical advisors. These forecasts would enable PWC to identify possible generation and network capacity constraints, and to assess system adequacy.

3.49 PWC considered some planning instruments used in the NEM, such as the National Transmission Network Development Plan prepared by AEMO, inappropriate for the Territory’s context because PWC did not distinguish between distribution and transmission.

3.50 PWC was also of the view that network and transmission planning should remain with PWC Networks.

3.51 PWC considered the annual Power System Review prepared by the Commission to be appropriate.

3.52 PWC brought to the Commission’s attention that the System Controller had started allocating additional resources monitoring technical compliance, developing statement of opportunities, and assessing system adequacy (using NEM-like PASA).

3.53 QEnergy was supportive of the Commission’s draft recommendation.

*Comments regarding draft recommendation 1(b) – Clearly defined power system reliability standards and performance targets*

3.54 PWC was supportive of the development and application of reliability standards and performance targets for its generation and network infrastructure.

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- 3.55 PWC brought to the Commission's attention it was reviewing the Network Planning Criteria in line with other jurisdictions, recognising the impact of loss of supply on customers and cost of security in different situations.

*Comments regarding recommendation 1(c) – Safety net arrangements*

- 3.56 PWC noted that detailed options for the regulatory mechanism for procuring generation of the last resort services had not been provided in the Draft Report.
- 3.57 PWC advised that PWC Generation being the default generator of last resort in the Territory had added cost to its business. PWC was supportive of being the generator of the last resort as long as the associated costs were recognised.

### **Response to views in submissions and further analysis**

- 3.58 The Commission agrees with PWC that not all planning instruments used in the NEM are appropriate in the Territory context. However, the Commission considers that the elements of the National Transmission Network Development Plan associated with jurisdictional transmission network planning are applicable in the Territory.
- 3.59 The Commission is not convinced that transmission planning should remain within the PWC Network group. The Commission considers that the System Control group is best suited for managing this function as the capacity, reliability and security of the transmission network is more related to the power system adequacy than distribution network operations. The Commission considers that a move of the transmission planning functions to the System Controller would strengthen its expertise on system adequacy and would give it a greater strategic focus, going beyond the specific interests of the distribution network.
- 3.60 With respect to reliability and security standards, in its Review of Electricity Standards of Service, the Commission had proposed that a target for generation reliability be established in the proposed upcoming Standards of Service Code, using maximum unserved energy (USE). The Commission is of the view that system reliability targets should be set, monitored and administered by the System Controller. Maximum unserved energy is a system reliability measure (rather than a specific generator's reliability measure), it therefore fits well with the System Controller's focus on system planning and monitoring. The Commission proposes to incorporate system reliability measures (such as USE) in the System Control Technical Code. This will be discussed with market participants at a later stage.
- 3.61 The Commission supports the System Controller's initiatives to assess short and medium term system adequacy using a NEM-like PASA and to develop a statement of opportunities. The Commission notes that such initiatives were also supported by NTMEU in their submission on the Commission's Issues Paper. NTMEU considered that this information would provide long term advice to prospective generation providers of the potential for investment in generation.<sup>25</sup>

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<sup>25</sup> Northern Territory Major Energy Users, January 2011, Submission to the Issues Paper on the Review of Electricity System Planning, Monitoring and Reporting, page 17.

## Final recommendation

3.62 The Commission does not propose to make further changes to its recommendations relating to system planning except for:

- recommendation 1(a), where the Commission also supports the introduction and use of Regulatory Investment Tests for Transmission (RIT-T) as part of system planning to ensure that transmission network developments are subject to a cost-effectiveness evaluation; and
- recommendation 1(c), where the Commission recommends the development of a regulatory mechanism for the procuring of ancillary services (i.e. frequency and voltage control services) that include generator of last resort services and determining who is responsible for the provision of those services.

## Power system monitoring

3.63 Monitoring of the power system provides the system operator and industry participants with information about the operation and performance of electricity infrastructure.

Monitoring activities assist to identify whether the performance of power system assets is consistent with the targets established through the regulatory bargain, and to identify components of the system requiring remediation or augmentation.

3.64 Oversight of system performance relative to the reliability and security standards and technical parameters provides critical information about the health of the power system and component assets. This information is useful for identifying possible improvements to operating practices, informing maintenance schedules, for system planning purposes (e.g. augmentation) and potentially to adjust reliability standards and targets.

3.65 Monitoring helps make an electricity business accountable for their performance against relevant obligations and standards, and provides information that should support future planning.

3.66 An example of monitoring in the NEM is the investigation of power system incidents where equipment failure, natural events or operator error cause a significant deviation from normal operating conditions. AEMO reviews and reports 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.<sup>26</sup> This supports the ongoing effective operation of the power system and ensures there is visibility and recognition of incidents.

3.67 Compliance is another monitoring activity. For example, the System Controller can require generators to test and demonstrate the performance capabilities of their equipment.<sup>27</sup> Monitoring compliance with technical obligations is intended to establish a discipline on the generator to operate within the technical envelope and give the system operator the confidence that the system security and reliability standards can be maintained.

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<sup>26</sup> National Electricity Rules 4.8.15

<sup>27</sup> System Control Technical Code, version 3, May 2010, s6.24.

## Effectiveness of Territory system monitoring

- 3.68 The Davies Enquiry<sup>28</sup> which was a response to the equipment failures at the Casuarina zone substation in late 2008 indicated that a key factor contributing to the asset failures and associated power outages was a lack of routine monitoring of asset health by the DNSP. The consequence was that the assets did not perform as expected, thereby adversely affecting system reliability and security.
- 3.69 Similarly, in investigating the 30 January 2010 Darwin-Katherine System Black, the System Controller found that:<sup>29</sup>
- ...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.*
- 3.70 The Commission has been advised by PWC that it is taking steps to improve asset management and monitoring practices to better understand asset and system health.
- 3.71 The monitoring of the technical compliance of industry participants with defined technical parameters should encourage electricity businesses and the system operator to identify actions that will contribute to the reliable and secure operation of the power system.
- 3.72 Similarly, the routine investigation and reporting of the cause and implications of power system incidents is appropriate to provide greater visibility of events that adversely affect system reliability (i.e. customers), thereby making the industry participants involved more accountable for the operation of the power system.
- 3.73 In the NEM, the AER is responsible for monitoring of the technical compliance of industry participants and the system operator (AEMO), and undertakes regular audits to determine if they have adequate compliance programs, and if their operating practices and equipment meet NEM technical parameters.<sup>30</sup>
- 3.74 The monitoring of the technical compliance of the system operator and industry participants with the defined technical parameters provides a level of oversight that should assist the industry participants and system operator to identify actions that will contribute to the reliable and secure operation of the power system.

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<sup>28</sup> Mervyn Davies, February 2009, Final Report: Independent Enquiry into Casuarina Zone Substation Events and Substation Maintenance Across Darwin. Refer Power and Water Corporation website, [http://www.powerwater.com.au/data/assets/pdf\\_file/0018/12348/Mervyn\\_Davies\\_Final\\_Report.pdf](http://www.powerwater.com.au/data/assets/pdf_file/0018/12348/Mervyn_Davies_Final_Report.pdf).

<sup>29</sup> System Control, Darwin Katherine Power System Investigation Report Arising from Black System of 30 January 2010, July 2010, page 23.

<sup>30</sup> National Electricity Rules, 4.15. Also refer Australian Energy Regulator, June 2009, Compliance and Enforcement – Statement of Approach.

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*Process for amending the technical codes*

- 3.75 The Commission notes that, at present, PWC Networks is responsible for initiating amendments to the Network Connection Technical Code and Network Planning Criteria, and the System Controller has primary responsibility for initiating amendments to the System Control Technical Code.<sup>31</sup> The Commission is responsible for approving amendments to these codes.
- 3.76 Effectively the onus is on PWC Networks and the System Controller to respond to inadequate rules by seeking approval from the Commission to change those rules.
- 3.77 The perceived effort involved in seeking an amendment to a code or the possibility of competing priorities has the potential to deter an improvement being sought or progressed. As an example, the proposed amendment to the System Control Technical to increase the level of incident reporting by market participants was initiated in November 2009 and is yet to be completed.
- 3.78 To date, there have been two revisions to the System Control Technical Code initiated by the System Controller since 2002, while the Network Connection Technical Code has not been amended since being approved by the Commission in 2003. No set of rules dealing with electricity supply is so appropriate that they can exist for such extended periods without needing improvement or revision to reflect changing operating circumstances. A mechanism or trigger for regular review of technical parameters established by the regulatory framework is warranted.

*Technical compliance*

- 3.79 Monitoring of system capability relative to the technical parameters is a core function of the system operator (i.e. System Control), primarily by:
- routine examination of compliance by system participants with technical parameters, which in the Territory are outlined in the System Control Technical Code and Network Connection Technical Code; and
  - investigation and reporting on power system incidents.
- 3.80 Effectively, the monitoring framework for the power system should establish mechanisms that work to identify potential risks to security and reliability and learn from mistakes. For example, the duration of the Darwin-Katherine system black of 31 January 2010 was exacerbated by switching errors and inadequate operating practices. The episode highlighted improvements to operating practices that should support improved reliability and security of supply.
- 3.81 The Commission has been working closely with PWC since late 2009 to assist PWC to develop appropriate compliance processes for achieving and demonstrating compliance with regulatory obligations and technical performance requirements.
- 3.82 In particular, the Commission has placed a priority focus on compliance with technical requirements, and PWC has reported on procedural compliance by generators and System Control with the System Control Technical Code.

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<sup>31</sup> The PWC System Control Licence gives the Commission the ability to request the System Controller make amendments to the System Control Technical Code.

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3.83 Similarly the System Controller has signalled a more robust compliance approach by establishing an obligation in the System Control Technical Code for generators to test and demonstrate the performance capabilities of their equipment.<sup>32</sup>

#### *Incident reporting*

3.84 The Territory's regulatory framework does not, at present, establish comprehensive incident reporting arrangements. In the NEM there are clear processes for responding to power system incidents, with AEMO 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.<sup>33</sup>

3.85 The absence of an equivalent processes in the Territory gives rise to the possibility that the cause of incidents may not be fully explored and that possible improvements to the operating practices or the overarching technical parameters may not be identified or progressed.

3.86 Good industry practice involves the routine investigation of all incidents affecting reliability or security of supply by the business involved (i.e. the generator or DNSP). If the incident is a major outage affecting thousands of customers or there is evidence of a pattern of minor outages, then the system operator or an independent expert would investigate the event.

3.87 A further benefit of establishing an obligation on the system operator to investigate and report on certain incidents is to provide greater visibility of events that adversely affect system reliability, thereby making the industry participants involved more accountable for the operation of the power system.

#### *Cost of monitoring*

3.88 The Commission is aware that there is a cost to businesses associated with monitoring of performance. However, the Commission notes that best practice requires monitoring and measurement of operating activities and performance as a routine part of day to day business operations, including to provide the system health data used to determine the capital and maintenance actions required to meet reliability targets.

### **Draft recommendations – system monitoring**

3.89 In the Draft Report, the Commission made three preliminary recommendations regarding system monitoring in the Territory.

#### *Draft recommendation 2(a) – Monitoring of compliance*

3.90 The Commission recommended that all electricity entities be required to develop and maintain a robust compliance process for the power system (generation and transmission). The monitoring of compliance against standards was regarded as an important feature of system monitoring.

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<sup>32</sup> System Control Technical Code, version 3, May 2010, s6.24.

<sup>33</sup> National Electricity Rules, 4.8.15.

*Draft recommendation 2(b) – Monitoring of power system incidents*

3.91 The Commission recommended the development and implementation of a mechanism for the investigation of power system incidents.

*Draft recommendation 2(c) – Development of process for oversight and review of technical obligations and parameters*

3.92 The Commission recommended the development of a clear process for oversight and the regular review of technical obligations and parameters for the power system established through the regulatory framework.

**Views in submissions***Comments on draft recommendation 2(a) – Monitoring of compliance*

3.93 PWC pointed out that it is spending considerable effort in developing a compliance framework in accordance with the Australian Standard on Compliance Programs (AS3806).

3.94 PWC also conveyed that the System Controller was the most appropriate entity to monitor and maintain compliance with technical standards relating to security, reliability or economic operation of the power system.

*Comments on draft recommendation 2(b) – Monitoring of power system incidents*

3.95 PWC submitted that, in developing a formal approach to the power system incident reporting framework, thresholds and triggers should be set to ensure that only relevant incidents be reviewed and reported. PWC was of the view that the System Controller should be the entity responsible for undertaking investigations and reports, and should be given the discretion to determine major versus minor power system incidents.

*Comments on draft recommendation 2(c) – Development of process for oversight and review of technical obligations and parameters*

3.96 PWC was of the view that System Control was the most appropriate entity to oversee and review technical obligations and parameters, and the technical compliance activities of system participants.

3.97 PWC considered that a process ensuring oversight of the System Controller's compliance with its obligations was already in place with the inclusion of an expanded compliance provision in the System Control licence.

3.98 QEnergy was supportive of the Commission's draft recommendations relating to system monitoring.

**Response to views in submissions and further analysis**

3.99 The Commission generally agrees with PWC's views on monitoring of compliance and power system incidents.

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- 3.100 The Commission is supportive of the supervisory function of market participants being undertaken by the System Controller. This view is also communicated in the Review of Electricity System Planning and Market Operation Roles and Structures.<sup>34</sup>
- 3.101 The Commission is of the view that the administration of the technical codes (currently the responsibility of the System Controller and PWC Networks) should be moved to the Commission under a single Electricity Industry Code. Potential reviews or amendments of technical obligations and parameters would be submitted by market participants to the Commission in accordance with a defined code amendment process. This would reduce actual or perceived conflicts of interest within PWC by separating responsibility for rule-making, oversight and operation functions.
- 3.102 The Commission accepts that the oversight of the System Controller's compliance with its technical obligations could generally be covered by conducting regular audits in accordance with the compliance provisions included in the PWC licences. However, as also stated in the in the Review of Electricity System Planning and Market Operation Roles and Structures, the Commission is of the view that the monitoring functions of the System Controller's compliance with its obligations should be specifically defined at a policy level and explicitly stated and documented in the legislation. This would result in a more effective regulatory framework.<sup>35</sup>

### **Final recommendation**

- 3.103 The Commission does not propose to make further changes to its recommendations relating to system monitoring.

### **Power system reporting**

- 3.104 Power system reporting involves the routine release of comprehensive and authoritative data to industry participants, prospective participants, customers, regulators and policy-makers to:
- support planning and monitoring activities by providing data to assist identification of the optimal investment options, and to facilitate coordination of investment actions;
  - advise on system performance against the price and service expectations of the regulatory bargain; and
  - assist in holding electricity businesses accountable for reliability performance outcomes.

### **Power system reporting practice**

- 3.105 System reporting should inform the energy industry, potential investors, policy makers and the community about the performance of the power system by relaying:
- planning information, including demand forecasts, the adequacy of system capacity relative to forecast demand, and knowledge of planning and investment commitments;

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<sup>34</sup> Utilities Commission, December 2011, Review of Electricity System Planning and Market Operation Roles and Structures – Final Report, page 5.

<sup>35</sup> Ibid.

- the performance and health of the system, which includes information on system performance trends, regulatory and technical compliance (including equipment capability relative to security standards) and the findings of investigations into power system incidents; and
  - outcomes experienced by customers.
- 3.106 The expectation is that this information will establish visibility of outcomes and hold participants accountable for their investment and operating actions and decisions.
- 3.107 There are a range of reporting arrangements adopted across Australia's three electricity markets (i.e. the NEM, the Territory and Western Australia) and individual jurisdictions to provide information on the power system.
- 3.108 Good industry practice for reporting in Australia includes:
- planning instruments produced by AEMO for the NEM, including the electricity statement of opportunities and national transmission network development plan and projected assessment of system adequacy;
  - Australian Energy Market Commission (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;<sup>36</sup> and
  - power system incident reports. These reports are prepared by AEMO in the NEM (as system operator) to identify potential changes to systems and practices that might improve the reliability and security of the power system.
- 3.109 AEMO releases a suite of planning instruments and information that contain information that can help guide targeted investment and the future development of Australia's electricity infrastructure and resources. In particular, AEMO prepares independent modelling and advice on strategic planning and credible future electricity demand and supply scenarios for the NEM through:<sup>37</sup>
- the National Transmission Network Development Plan (NTNDP), which provides a strategic view of the efficient development of the NEM transmission grid for the next 20 years under a range of credible scenarios;
  - Electricity Statement of Opportunities (ESOO), which provides 10 year projections of electricity supply and demand and highlights opportunities for new investment in each NEM region based on a range of economic scenarios. The ESOO serves as a guide to the environment for potential new investment by indicating areas of the NEM which may benefit from additional generation to accommodate future demand;
  - Power System Adequacy (PSA), which provides a two year outlook of operational issues and the supply-demand balance. The PSA supports the ESOO, but has a more operational focus;

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<sup>36</sup> 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>.

<sup>37</sup> Australian Energy Market Operator, Annual Report 2010, pages 16-18

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- Victorian Annual Planning Report, a mechanism for joint planning for development of the Victoria transmission and distribution networks, and to provide the electricity sector with confidence that the transmission network will be upgraded as required to meet future demand and to ensure ongoing system reliability; and
  - South Australian Supply and Demand Outlook (SASDO), a report 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.
- 3.110 The form and approach of reporting has undergone extensive change in recent years, including due to the transfer of jurisdiction specific reporting functions to AEMO and an increased focus on the capability of the power system to meet summer time peak demand.
- 3.111 The ESOO and PSA are prepared by AEMO to provide information to assist generators, TNSPs and market participants in making an assessment of the future need for electricity generating or demand management capacity or augmentation of the power system.<sup>38</sup>
- 3.112 The ESOO and PSA examine 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.<sup>39</sup> The ESOO and PSA provide information to assist industry participants assess the future need for electricity generating capacity, demand side capacity and augmentation of the network to support the operation of the NEM. A year by year supply-demand balance is presented for each region in the NEM as a snapshot forecast of the capacity of generation and transmission to satisfy demand for electricity into the future.<sup>40</sup>
- 3.113 The scope of the ESOO, PSA are set out in the National Electricity Rules providing AEMO with standing terms of reference for each instrument. Together the ESOO and PSA (and the NTNDP) establish a comprehensive and authoritative set of planning information to guide efficient development of the NEM power system.
- 3.114 Supporting the ESOO/PSA is the projected assessment of system adequacy, which is a comprehensive program of information collection, analysis and disclosure of medium term and short term power system security and reliability of supply prospects.<sup>41</sup>
- 3.115 The PSA provides an assessment of generation adequacy for the coming two years, and system adequacy against operational criteria, such as capacity reserve, energy reserve

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<sup>38</sup> National Electricity Rules, Chapter 10.

<sup>39</sup> National Electricity Rules, 3.13.3 (q) and Australian Energy Market Operator, 2010 Electricity Statement of Opportunities, June 2010.

<sup>40</sup> Australian Energy Market Operator, July 2010, An Introduction to Australia's National Electricity Market, page 18.

<sup>41</sup> National Electricity Rules, 3.7.1. Also refer Australian Energy Market Operator, 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.

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and frequency control (i.e. operating matters relevant to maintaining system security and stability).<sup>42</sup> AEMO also identifies any actions to address a potential capacity shortfall.

- 3.116 Importantly, AEMO is held accountable for the content of the ESOO/PSA, and must report annually to the AEMC Reliability Panel on the accuracy of the demand forecasts central to the estimates of future generation capacity needed.<sup>43</sup> Also aiding the accountability of the system operator and the credibility of the NEM planning instrument is the annual Reliability Panel report on NEM and system operation in the previous year.
- 3.117 The Commission considers that the ESOO and PSA could be particularly relevant to the Territory context.

#### *Health of system data*

- 3.118 Health of system information is most useful to industry participants for determining whether the system is maintaining reliability and security of supply standards. The type and level of reporting should support compliance by individual industry participants and the system operator with regulatory and technical obligations. For example, public reporting of the findings of incident investigations provides visibility of major power outages, thereby establishing an incentive for changes to avoid similar events in the future. This supports monitoring activities.

### **Effectiveness of existing system reporting framework in the Territory**

- 3.119 The annual Power System Review is the nearest Territory equivalent to the planning instruments used in the NEM to provide information which might be used to guide investment and operation decisions in the Territory's power systems. The Power System Review is prepared by the Commission to fulfil the requirements of the *Electricity Reform Act* [s45] to:
- develop forecasts of overall electricity load and generating capacity, in consultation with participants in the electricity supply industry;
  - review and report on the performance of the Territory's systems;
  - advise on matters relating to the future capacity and reliability of the Territory's system relative to forecast load; and
  - publish an annual review of the prospective trends in the capacity and reliability of the Territory's system relative to projected load growth.

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<sup>42</sup> 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.

<sup>43</sup> National Electricity Rules 3.13.3 (u).

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- 3.120 The Power System Review is an evolving project, with the future content and approach informed by this review and good industry practice. Other system related reporting includes:
- half yearly reports to the Commission by the System Controller on the technical performance of the power systems and major incidents<sup>44</sup>. The Commission has drawn on these reports in preparing the Power System Review and the Commission's annual report, but they have not been generally publicly available;
  - quarterly reports to system participants by the System Controller on the technical performance of the power systems and major incidents relevant to the participant;<sup>45</sup>
  - investigation reports for major system faults and incidents<sup>46</sup>. These reports are provided to affected system participants. There is no guidance on when the System Controller might investigate an incident, and no requirement for reports to be publicly available;
  - compliance reporting by industry participants to the Commission. A review of procedural compliance by System Control with the System Control Technical Code was completed for 2009-10. The Commission's annual report includes commentary on the results of compliance reporting; and
  - standards of service and reliability reporting, with generation reliability performance statistics reported under the Electricity Standards of Service Code and as part of the annual Power System Review. The standards of service reports are available on the Commission's website.
- 3.121 The test of the effectiveness of system reporting is whether the reported information supports good system planning and desired performance outcomes, especially by providing visibility of reliability outcomes and by making the system operator and industry participants accountable for the outcomes of their decisions and actions.
- 3.122 In this context, the Commission's concerns about the planning and monitoring arrangements also apply to reporting arrangements. For example, the 2008-09 Power System Review noted that:<sup>47</sup>
- ...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.*
- 3.123 Subsequently, the 2009-10 Power System Review noted that:<sup>48</sup>

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<sup>44</sup> 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.

<sup>45</sup> System Control Technical Code, s7.4

<sup>46</sup> System Control Technical Code (v3), s.6.23

<sup>47</sup> Utilities Commission, March 2010, 2008-09 Power System Review, page 28

<sup>48</sup> Utilities Commission, March 2011, 2009-10 Power System Review, page 26

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*The reserve plant margin being maintained in the Darwin-Katherine system for the period 2012 to 2016 may be greater than what is reasonably necessary to maintain reliability of supply... The need for the planned level of generation capacity and reserves could be prompted by doubts about the condition and reliability of existing generation plant, particularly at Channel Island. If so, the Commission considers that these doubts should be reflected in the generation maintenance program to recognise the availability and reliability of generation plant and to support the generation capital investment program.*

- 3.124 The 2008-09 and 2009-10 Power System Reviews documented the Commission's ongoing concern about the quality and availability of information needed to assess the adequacy of the power system. However, this is primarily a reflection of the lack of rigour of the system planning and system monitoring arrangements (i.e. information not routinely asked for will not necessarily be available).
- 3.125 The Commission recognises that the Territory's annual Power System Review covers similar ground as the AEMO reports on generation and system adequacy, but requires further development to provide certainty about demand forecasts and appropriate adequacy levels. That is, the underlying activities required for system planning need to improve to reflect good industry practice, such as demand forecasting.
- 3.126 In its response to the Issues Paper, the Commission notes NTMEU's view that a sound reporting structure and enforcement has the major benefit of creating an environment where new entrant generation and retail has the ability to identify where and how they might enter the Territory market. This means that such reporting is both comprehensive and accurate. To ensure that these essential criteria are met, there needs to be considerable independence in the preparation of reports.<sup>49</sup>
- 3.127 As noted by the NTMEU, the outcomes experienced by customers are the most important factor for determining how the power system is performing. Therefore customers should be able to expect regular information on the system performance achieved. The Commission notes that the Queensland regulator required quarterly reports of reliability experienced by customers of the two local DNSPs, including generation, transmission and distribution network reliability outcomes for the period.
- 3.128 The Commission expects greater level of reporting of distribution and transmission networks, generation and customer service performance with the establishment of a new Electricity Standards of Service Code, developed in accordance with the Commission's review of the adequacy of existing electricity standards of service arrangements in the Territory. Similarly, the addition in the System Control Technical Code of incident reporting requirements by market participants are expected to provide a greater level of transparency and accountability amongst electricity market participants.
- 3.129 NTMEU conveyed its concern about system adequacy projections. NTMEU was of the view that assessments of system adequacy should be undertaken by an expert party with a measure of independence to avoid potential conflicts of interest. The long term needs of customers need to be to the forefront when considering future needs. The NTMEU was of

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<sup>49</sup> Northern Territory Major Energy Users, January 2011, Submission to the Issues Paper on the Review of Electricity System Planning, Monitoring and Reporting, page 25.

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the view that there was a need for independent reporting of all significant incidents that occur in the power system. This approach followed that used in the NEM where AEMO and AER report on incidents that impact customers<sup>50</sup>.

- 3.130 PWC was of the view that PWC provides information and reports to the Commission that allows it to monitor, and where appropriate report, on the performance of the Territory's electricity system.<sup>51</sup> PWC suggested that any recommendation by the Commission to require reporting against new templates and the provision of new reports needed to consider the organisational impacts on PWC, and ultimately, whether there will be any benefits to electricity consumers.

### **Draft recommendations – system reporting**

- 3.131 In the Draft Report, the Commission made two preliminary recommendations regarding system reporting in the Territory.

#### *Draft recommendation 3(a) – Power system reporting consistent with that of the NEM*

- 3.132 The Commission recommended the development and implementation of a framework for the reporting of comprehensive and authoritative power system information. This information would support acceptable reliability performance in the Territory's power systems. Information that should be reported includes:
- system planning information, including demand forecasts, the adequacy of system capacity relative to forecast demand, adequacy of fuel supplies and other major security risks, and knowledge of planning and investment commitments. The planning instruments should replicate the purpose and characteristics of the AEMO ES00/PSA and NTNDP instruments for the NEM;
  - health of the system information, including on system performance trends, regulatory and technical compliance and the findings of investigations into power system incidents; and
  - the reliability outcomes experienced by customers.

- 3.133 It was recommended that the Territory's regulatory framework require a similar suite of instruments or reports as is available in the NEM. The important criteria were that the content of the reports be consistent with those available in the NEM, and that the data was available at a convenient time in the planning cycle.

#### *Draft recommendation 3(b) – Independence of power system reporting*

- 3.134 The Commission recommended that the reporting framework ensure appropriate independence in the preparation of reporting instruments. To ensure that reporting was both comprehensive and accurate there was a need for considerable independence in the preparation of reports, with parties held accountable for the information reported. The responsible entity could be required to certify that the material presented is accurate (on a

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<sup>50</sup> Northern Territory Major Energy Users, January 2011, Submission to the Issues Paper on the Review of Electricity System Planning, Monitoring and Reporting, pages 21-24.

<sup>51</sup> Power and Water Corporation, January 2011, Submission to the Issues Paper on the Review of Electricity System Planning, Monitoring and Reporting, page 7.

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best endeavours basis). The data reported should also be subject to oversight by an appropriate body to confirm that assumptions and forecasts are reasonable.

### **Views in submissions**

#### *Comments on draft recommendation 3(a) – Power system reporting consistent with that of the NEM*

- 3.135 PWC re-iterated a point made earlier in its submission, that it currently provides a range of information and reports including the annual Standards of Service Report; six monthly System Performance Reports and investigation reports of major system faults and incidents by the System Controller; and information for the Power System Review which, according to PWC, meets a majority of the requirements put forward by the Commission.
- 3.136 PWC was of the view that, in order to address issues of independence, it was best for the Power System Review to continue being prepared by the Commission.
- 3.137 Finally, PWC considered that the Commission had not adequately articulated the need for additional levels of reporting above those currently in place.

#### *Comments on draft recommendation 3(b) – Independence of power system reporting*

- 3.138 PWC was of the view that the current levels of accountability, reporting arrangements and audit processes provide sufficient assurance of the accuracy of system reporting.
- 3.139 QEnergy was supportive of the Commission's draft recommendations relating to system reporting.

### **Response to views in submissions and further analysis**

- 3.140 The Commission remains of the view that the Territory regulatory framework should adopt a suite of system planning and reporting instruments that are consistent with the purpose and characteristics of the AEMO ESOO/PSA and NTNDP (i.e. the elements associated with jurisdictional transmission network planning) for the NEM as their purpose is to provide authoritative data to support the identification of the most economic future options for augmentation and expansion of infrastructure to maintain security and reliability standards on a cost effective basis.
- 3.141 The Commission accepts that the Power System Review could fulfil this role, but only with further development so that the Power System Review is recognised as an authoritative source of information for guiding operating and investment decisions for the power system. It is noted that PWC's assistance in providing information to the Commission has significantly increased over the past two years with the development of a more comprehensive Power System Review.
- 3.142 In relation to holding system participants accountable for the information reported, the Commission acknowledges PWC's view that external audits provide strong assurance about the accuracy of information by regulated entities. However, the Commission considers that, because of their cost and considerable drain on the company's resources, external audits can only be used occasionally.
- 3.143 The Commission supports the idea that the data and reports provided to the Commission be accompanied by a declaration to be signed by the chief executive officer or managing director, certifying that the information meets all the requirements. The Commission considers that this additional requirement would complement the external audit process in
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ensuring that the entity has internal quality systems in place to provide accurate information.

- 3.144 The Commission is of the view that utilising signed declarations will ultimately reduce the audit cost to regulated entities as the audited firm will be able to demonstrate to the auditors it has developed robust systems and procedures to ensure the accuracy of the data. Having recourse to signed declarations would also reduce the Commission's reliance on independent audits.

### **Final recommendation**

- 3.145 The Commission does not propose to make further changes to its recommendations relating to system reporting.
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## CHAPTER 4

### Distribution network – planning, monitoring and reporting

- 4.1 The distribution network comprises the poles, wires, substations, transformers, switching, monitoring and signalling equipment used to transport bulk electricity from the transmission network to customers.

#### Distribution network planning

- 4.2 Distribution network planning involves identifying a credible future of network demand and supply to guide the decisions about managing and developing distribution network infrastructure so as to deliver a safe supply of electricity that meets reliability, security and quality standards at the lowest long term cost.
- 4.3 Distribution planning activities should support the identification of the most economic future investments for augmentation and expansion in the network (e.g. a suburb or industrial park) to maintain reliability on a cost effective basis. Distribution planning has a bottom up focus that looks at the capability of network infrastructure to meet current and future peak demand at the zone substation level, and potentially the feeder level.

#### Distribution network planning practices

- 4.4 Distribution network planning involves looking forward up to 10 years to compare the capacity of network infrastructure (e.g. substations, transformers and the poles and wires) with the forecast future peak demand, and to assist identification of the network infrastructure (or demand management) investment options.
- 4.5 Distribution network peak demand is influenced by the electricity consumption patterns in the substation service area. Therefore, a whole of network demand forecast is the aggregate of forecast loading/demand for individual substations, which is determined by factors including the household, business or industrial demand, residential subdivision development, air-conditioner penetration, if the area is CBD/urban/rural and the potential for large spot loads (energy intensive industry projects).
- 4.6 Forecasts of peak demand are used to inform decisions about infrastructure capacity and the management of the electricity network to ensure a reliable electricity supply to customers.
- 4.7 DNSPs operating elsewhere in Australia are generally obliged to report planning related information on an annual basis. The Ministerial Council on Energy (MCE) announced in October 2010<sup>52</sup> 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.

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<sup>52</sup> 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.

- 4.8 Oversight of the planning decisions and activities of a DNSP is a result of the natural monopoly characteristics of network infrastructure, and the potential for network related investment decisions to reflect a company's commercial interests, rather than the long term interests of customers. The purpose is to assist achievement of desired reliability outcomes expected through the regulatory bargain.

### **Effectiveness of Territory distribution planning**

- 4.9 PWC Networks has supplied the Commission with a Network Planning and Reliability Report since 2009, in response to a Commission request for network planning and reliability information. Unlike other jurisdictions in Australia, the Territory's regulatory framework does not require the regular production of a report on network capability and future reliability performance.
- 4.10 The critical inputs to the planning activities of a DNSP are demand forecasts, the reliability standards to be achieved (i.e. the reliability outcomes that should be experienced by the customer) and asset capabilities including knowledge of the condition and management of assets).

#### *Demand forecasts*

- 4.11 The 2009-10 Power System Review looked at the demand forecasts developed by PWC Networks for each zone substation for 2010-11 to 2014-15. These forecasts were considered reasonable for the purpose of testing network infrastructure adequacy.
- 4.12 Nonetheless, the need for continuous improvement in the approach to demand forecasting for system planning purposes applies also to the development of network demand forecasts. As is the case with demand forecasts used for system planning purposes, 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 DNSPs applying standard weather corrections, econometric modelling, probabilistic techniques and scenario analysis.

#### *Reliability and security standards*

- 4.13 The Commission has foreshadowed specifying target network reliability outcomes as part of the network price determination process for the 2014-19 regulatory period. In particular, the Commission is considering establishing average and minimum performance standards for each of the feeder types in the distribution network<sup>53</sup>. PWC Networks would be responsible for translating these reliability targets into reliability criteria that are achieved through the capital and maintenance program.
- 4.14 Practice in Australia and in the Territory<sup>54</sup> 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.

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<sup>53</sup> Refer Utilities Commission, November 2010, Review of Electricity Standards of Service – Final Report.

<sup>54</sup> 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/nt/utilicom/electricity/networks\\_pricing.shtml](http://www.nt.gov.au/nt/utilicom/electricity/networks_pricing.shtml).

### *Asset management capability*

- 4.15 A distribution network comprises an interconnected collection of assets and equipment that are spread across an extensive area. The management of this infrastructure is fundamental to the effective operation of the distribution network, and the delivery of a safe, reliable and cost effective electricity service.
- 4.16 The DNSP is responsible for the operation and management of the network. Planning and asset management require decisions about the selection, design/acquisition, operation, maintenance and renewal/disposal of assets.
- 4.17 Good asset management requires a firm to have coordinated information technology systems and practices that facilitate optimal and sustainable management of assets, their performance, risks and expenditures over their life cycles. A consequence of poor asset management is poor reliability of assets and poor customer reliability outcomes, such as more frequent and longer power outages.
- 4.18 PWC has an Asset Management Capability (AMC) project to acquire an integrated asset management system and geographic information system, supported by appropriate business processes, change management and data improvement. The AMC project should enable PWC to significantly improve the management of assets, risks and the delivery of services to customers by providing the systems and practices necessary to achieve good industry practice for asset management.

### *Reliability and security standards*

- 4.19 A critical element of distribution planning is reliability and security standards which explicitly reflect a desired reliability outcome.
- 4.20 PWC Networks is required to adopt an N or N-1 network reliability criteria.<sup>55</sup>
- 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.
- 4.21 PWC Networks investment decisions are guided by the Network Planning Criteria:<sup>56</sup>
- 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.*
- 4.22 The Commission understands that PWC Networks is reviewing the Network Planning Criteria, and plans to review the Network Connection Technical Code during 2011. Before amending the Network Connection Technical Code or Network Planning Criteria in a material way, PWC Networks is required to undertake public consultation on the

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<sup>55</sup> Network Connection Technical Code (v2), April 2003, s.2.7.

<sup>56</sup> Network Planning Criteria (v2), April 2003, page 3.

proposed amendments. Proposed amendments are ultimately considered for approval by the Commission.<sup>57</sup>

#### *Regulatory test*

- 4.23 Economic regulation practice involves external oversight and involvement of distribution planning through the network price determination process, or a regulatory investment test (referred to the RIT-D for distribution network projects).
- 4.24 In response to the Issues Paper, the NTMEU considered that the introduction of a regulatory investment test for distribution network assets in the Territory, together with a public assessment of the need for new investment, would provide a strong basis for limiting otherwise unfettered capital expenditure by a DNSP.<sup>58</sup>
- 4.25 The RIT is part of an assurance that options for major developments are properly considered. The test is essentially a cost-effectiveness test to ensure that the least cost option is selected for implementation, after considering demand forecasts, operating risks and development alternatives including demand management.
- 4.26 The five yearly assessments by the Commission of the PWC Networks' capital base and proposed capital and maintenance programs as part of the network price determination process provides oversight of investment levels relative to reliability performance. This assessment may take account of the application of the regulatory investment test in accepting project expenditure for inclusion in the regulated asset base.

#### **Draft recommendations – distribution network planning**

- 4.27 In the Draft Report, the Commission made two preliminary recommendations regarding distribution network planning in the Territory.

##### *Draft recommendation 4(a) – Routine publication of network planning data*

- 4.28 The Commission recommended the development and implementation of a framework that requires the routine publication of network planning data that replicates the purpose and characteristics of the annual planning instruments required of DNSPs in the NEM. The key components of these instruments would include:
- credible and dependable forecasts of future electricity demand and supply to identify possible future generation and transmission capacity constraints;
  - based on clearly defined security and reliability standards that reflect the customer price and service level outcomes of the regulatory bargain; and
  - authoritative data on the current and future capability and condition of infrastructure to inform decisions about the most economic future options for augmentation and expansion of infrastructure to maintain security and reliability standards across the supply chain on a cost effective basis.

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<sup>57</sup> Electricity Networks (Third Party Access) Code cl.9

<sup>58</sup> Northern Territory Major Energy Users, January 2011, Submission to the Issues Paper on the Review of Electricity System Planning, Monitoring and Reporting, page 18.

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4.29 Planning information should be updated regularly to provide a program of information collection, analysis and disclosure of power system security and reliability of supply prospects.

*Draft recommendation 4(b) – Development and application of clearly defined distribution network reliability standards and performance targets*

4.30 The Commission recommended the development and application of clearly defined distribution network reliability standards and performance targets were needed to support network planning. The Commission's Review of Electricity Standards of Service proposed that reliability performance outcomes be established for generation, transmission and distribution networks, including establishing a Territory Reliability Standard (based on a certain level of unserved energy) and network feeder reliability targets.

4.31 Reliability and security of supply standards and planning criteria should be regularly reviewed to ensure that planning criteria reflect the desired reliability outcomes.

4.32 A RIT should be introduced to ensure that network developments are subject to a cost-effectiveness evaluation.

### **Views in submissions**

*Comments on draft recommendation 4(a) – Routine publication of network planning data*

4.33 PWC accepted that certain aspects of the NEM regulatory arrangements for DNSPs would be appropriate for its network business. PWC brought to the Commission's attention that it was progressing a number of initiatives, including:

- the development of a spatial demand forecasting process in line with practices in other jurisdictions;
- a substantial review of the Network Planning Criteria; and
- the development of a comprehensive Network Management Plan in line with practices in other jurisdictions.

*Comments on draft recommendation 4(b) – Development and application of clearly defined distribution network reliability standards and performance targets*

4.34 PWC was strongly supportive of the Commission's recommendation to develop clearly defined distribution network reliability standards and performance targets to support network planning, provided they are based on realistic expectations about customers' willingness to pay for a given level of service.

4.35 PWC proposed a five year review cycle of the standards and planning criteria, in line with the network price determination cycle.

4.36 PWC did not support the introduction of the RIT process on the basis that:

- public notification of upcoming network augmentations to market participants and interested parties would have limited value; and
- business cases are prepared when significant network augmentation projects are considered.

4.37 QEnergy was supportive of the Commission's draft recommendations relating to distribution network planning.

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## Response to views in submissions and further analysis

- 4.38 The Commission welcomes PWC's progress with its review of its forecasting techniques, its Network Planning Criteria, and Network Management Plan. The Commission will form a view about the adequacy of these initiatives when they are submitted to the Commission for consideration and approval or as part of future Power System Reviews.
- 4.39 The Commission notes PWC's view about using business cases in lieu of a RIT for significant network augmentations. However, the current lack of publicly available information and confidentiality restrictions that exist on PWC's business cases mean that the Commission is not able to monitor the cost-effectiveness of PWC's network developments.
- 4.40 The Commission considers that the use of RIT is appropriate in the Territory, ensuring rigour and transparency. The RIT process should ensure that the network provider conduct a robust economic assessment of significant augmentation projects relative to alternative options, including non-network outcomes. The Commission notes that opportunities in more efficient, non-network solutions are unlikely to take place unless such information is made public. Therefore, the Commission does not agree with PWC's view that disclosure public notification of upcoming network augmentations using RITs would have a limited impact.
- 4.41 As previously mentioned in the Draft Report, the Commission is of the view that the RIT could be invaluable in assessing the adequacy of future augmentation projects when including them in the regulatory asset base as part the network price determination.
- 4.42 The Commission notes the comments made by the AER in their recent submission to the distribution network planning and expansion rule change proposed by the AEMC, in which the AER recommends that the approach set out for RIT-D not be overly prescriptive, ensuring sufficient flexibility in response to unforeseen market developments.<sup>59</sup>
- 4.43 The Commission considers that the development of the MCE rule change proposal for the development of a distribution network planning and expansion framework<sup>60</sup> could inform the network planning approach in the Territory.

## Final recommendation

- 4.44 The Commission does not propose to make further changes to its recommendations relating to distribution planning.
- 4.45 The Commission also supports the introduction and use of RIT for distribution as part of distribution planning to ensure that distribution network developments are subject to a cost-effectiveness evaluation.

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<sup>59</sup> Australian Energy Regulator, 24 November 2011, AER submission to the distribution network planning and expansion rule change proposal, page 4.

<sup>60</sup> Refer Australian Energy Market Operation's website: <http://www.aemc.gov.au/Electricity/Rule-changes/Open/Distribution-Network-Planning-and-Expansion-Framework.html>

## Distribution network monitoring

4.46 Monitoring of the distribution network performance provides information about the operation and performance of network infrastructure. Monitoring activities assist to identify whether the performance of network assets is consistent with the targets established through the regulatory bargain, and to identify components of the network requiring maintenance or augmentation.

### Distribution network monitoring practices

4.47 The Australian practice is for the DNSP to take primary responsibility for monitoring the condition and capability of network assets and to comply with technical performance requirements.

4.48 Oversight of network performance relative to reliability and security standards and technical parameters provides information about the health of the network and component assets. This information is useful for identifying possible improvements to operating practices, informing maintenance schedules, for planning purposes (e.g. augmentation) and potentially to adjust reliability standards and targets.

4.49 For example, monitoring by the DNSP can highlight deficiencies in asset management policies and ageing or deteriorating assets that might have an adverse affect on reliability or security of supply.

### Effectiveness of Territory distribution network monitoring

4.50 Monitoring highlights opportunities for improvement in operating practices and processes to support the achievement of desired reliability outcomes. Monitoring is essentially focused on compliance and the review of events to determine network health.

4.51 Monitoring is a central aspect of asset management. Oversight of the effectiveness of asset management can occur through:

- demonstrating compliance with technical parameters for network operation;
- investigation and reporting on distribution network incidents; and
- measuring performance trends.

4.52 PWC Networks has made substantial improvements in asset management following the Davies Enquiry, with condition based monitoring of network assets now an established asset management practice.<sup>61</sup>

4.53 However, improved condition assessment techniques and procedures have shown the condition of assets to be worse than anticipated, extending the time required for the initial condition assessment and remediation. PWC is taking steps to improve its understanding of the distribution networks, including by developing a system to provide a detailed understanding of asset condition, criticality and capability. This knowledge

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<sup>61</sup> Refer Power and Water Corporation website for information on improvements resulting from the Davies Enquiry, [http://www.powerwater.com.au/about\\_us/major\\_projects/power\\_supply\\_update](http://www.powerwater.com.au/about_us/major_projects/power_supply_update),

supports development of improved asset management strategies and detailed plans to achieve service level, reliability and supply security targets.<sup>62</sup>

- 4.54 The benefits accruing from the PWC efforts to improve asset management capability are a more reliable and cost effective distribution network. A better knowledge of network health should assist identification of the optimal investment decisions. However, the benefits will likely become visible in the next five years and will require ongoing adherence to good industry asset management and monitoring practices.

#### *Technical compliance*

- 4.55 The Commission has been working closely with PWC since late 2009 to develop appropriate compliance processes for achieving and demonstrating compliance with regulatory obligations and technical parameters. The Commission has placed a priority on compliance with technical requirements, and PWC has reported on procedural compliance by generators and System Control with the System Control Technical Code.
- 4.56 The AER has a role in monitoring of the technical compliance of industry participants and the system operator in the NEM, and undertakes regular audits to determine if they have adequate compliance programs, and if their operating practices and equipment meet NEM technical parameters.<sup>63</sup> Oversight of technical compliance should assist the industry participants and system operator to identify actions that will contribute to the reliable and secure operation of the power system.
- 4.57 The Commission has recommended in its Review of Electricity System Planning and Market Operation Roles and Structures that the System Controller should be responsible for monitoring and enforcing compliance by system participants with technical rules, and the Commission should be responsible for oversight of compliance by the System Controller with its obligations.<sup>64</sup>

#### *Incident reporting*

- 4.58 Good industry practice involves the routine investigation of all incidents affecting reliability or security of supply by the business involved (i.e. the generator or DNSP). If the incident is a major outage affecting thousands of customers or there is evidence of a pattern of minor outages, then the system operator or an independent expert would investigate the event or pattern of events.
- 4.59 The purpose of establishing an obligation requiring the investigation of certain incidents is to provide greater visibility of events that adversely affect system reliability, thereby making the industry participants involved more accountable for the operation of the power system.
- 4.60 The Commission undertook extensive consultation with PWC System Control throughout 2010-11 to address concerns regarding power system incident reporting. The Commission expects that the proposed incident reporting arrangements will be

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<sup>62</sup> Power and Water Corporation, submission to Issues Paper, page 4.

<sup>63</sup> National Electricity Rules, 4.15. Also refer Australian Energy Regulator, June 2009, Compliance and Enforcement – Statement of Approach.

<sup>64</sup> Utilities Commission, December 2011, Review of Electricity System Planning and Market Operation Role and Structures – Final Report, page 5.

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introduced through a revised System Control Technical Code before the end of the year.

#### *Measuring performance trends*

- 4.61 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.
- 4.62 Such data show the reliability performance of each feeder, each feeder category (CBD, urban, short rural and long rural) and the network as a whole, and information about the performance over time.
- 4.63 The performance trends 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, weather conditions and vegetation).
- 4.64 The Commission is currently developing new electricity standards of service framework which will ensure more comprehensive monitoring of the DNSP's reliability performance.

#### **Draft recommendations – distribution network monitoring**

- 4.65 In the Draft Report, the Commission made three preliminary recommendations regarding distribution network monitoring in the Territory.

##### *Draft recommendation 5(a) – Development of a compliance process*

- 4.66 The Commission recommended that the DNSP be required to develop and maintain a compliance process. A robust compliance process is an important feature of network monitoring.

##### *Draft recommendation 5(b) – Development of incident reporting arrangements*

- 4.67 The Commission recommended the development and implementation of a mechanism for the investigation of relevant distribution network incidents.

##### *Draft recommendation 5(c) - Review and reporting on compliance with technical obligations and parameters*

- 4.68 The Commission recommended a review of the processes and triggers for oversight and review of the technical obligations and parameters for the distribution network established through the regulatory framework (i.e. the Network Connection Technical Code).
- 4.69 Monitoring the operating practices and processes of the DNSP is essentially focused on compliance and the review of events affecting the reliability or security of the distribution network. Regular review and reporting on compliance with technical obligations and parameters is necessary.

#### **Views in submissions**

##### *Comments on draft recommendation 5(a) – Development of a compliance process*

- 4.70 PWC conveyed its support for this recommendation, emphasising its commitment to establishing compliance processes consistent with good compliance practice.
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4.71 QEnergy was of the view that the compliance process should be made stronger to require PWC with penalties for non-compliance.

*Comments on draft recommendation 5(b) – Development of incident reporting arrangements*

4.72 PWC provided that it would progress procedures and processes ensuring investigation of distribution network incidents.

*Comments on draft recommendation 5(c) - Review and reporting on compliance with technical obligations and parameters*

4.73 PWC referred to its review of the Network Connection Technical Code and Network Planning Criteria.

4.74 PWC expressed concern about the Commission potentially contemplating to adopt a more comprehensive approach to compliance monitoring of PWC Networks. PWC was of the view that the annual Compliance Audit was sufficient to address compliance with technical obligations.

4.75 QEnergy was supportive of the Commission's draft recommendations relating to distribution network monitoring.

### **Response to views in submissions and further analysis**

4.76 In response to PWC's concerns about the Commission's recommendation to review the processes and triggers for the oversight of the technical obligations, the Commission's view is to use the annual compliance audit to focus on compliance. The Commission is of the view that the audit scope should consider the purpose or intention of an obligation, and the reasons to include an obligation in the audit sample. However, should the Commission have any particular concerns about compliance, the Commission will consider using targeted audits. The Commission's intentions on technical compliance were communicated in the draft Statement of Approach on Compliance.<sup>65</sup>

4.77 Further, the Commission considers that, with the development of an Electricity Industry Code, there could be an opportunity to clarify the monitoring roles and functions in the Territory electricity supply industry. The Commission supports the view that PWC Networks should be responsible for distribution network compliance against standards, the System Controller should be responsible for technical compliance by market participants, and the Commission should monitor the System Controller's compliance with its obligations.

### **Final recommendation**

4.78 The Commission does not propose to make further changes to its recommendations relating to distribution monitoring.

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<sup>65</sup> Utilities Commission, September 2011, draft Statement of Approach on Compliance, page 20.

## Distribution network reporting

4.79 Distribution network reporting involves the routine release of comprehensive and authoritative data for industry participants, prospective participants, customers, regulators and policy-makers to:

- support planning and monitoring activities by providing data to assist identification of the optimal investment options, and to facilitate coordination of investment actions;
- advise on network performance against the price and service expectations of the regulatory bargain; and
- assist in holding electricity businesses accountable for reliability performance outcomes

### Distribution network reporting practices

4.80 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 to be introduced in the NER.<sup>66</sup>

4.81 DNSPs elsewhere in Australia are required to produce annual network planning and performance reports 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.<sup>67</sup>

4.82 Reporting also includes annual standards of service performance reports on 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.<sup>68</sup>

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<sup>66</sup> Ministerial Council on Energy, October 2010, Standing Committee of Officials Bulletin No. 184 MCE Response: AEMC Review of a National Framework for Electricity Distribution Network Planning and Expansion.

<sup>67</sup> 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.

<sup>68</sup> 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).

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*National framework for electricity distribution network planning and expansion*

4.83 A nationally consistent framework for reporting on distribution network planning decisions and performance is being developed.

4.84 The MCE announced in October 2010<sup>69</sup> 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. The proposed national arrangements would involve DNSPs reporting on an annual basis the following planning related information:<sup>70</sup>

- 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 DNSP's planning methodology;
- 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 DNSP's asset management methodology; and
- a summary of the DNSP's activities and actions taken to promote non-network initiatives, including embedded generation, and inform on any significant investments in metering services.

4.85 In April 2011, the AER released a statement of approach on the priorities and objectives of electricity network service provider performance reports. The objectives of the reporting arrangements established by the AER are:<sup>71</sup>

*...performance reports will enhance the effectiveness of the regulatory regime and reflect the NEL [National Electricity Law] requirements to foster the achievement of the NEO [National Electricity Objective] through incentive based regulation. The AER considers this will be achieved through enhancing the transparency and accountability of NSPs, and facilitating performance improvements.*

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<sup>69</sup> Ministerial Council on Energy Standing Committee of Officials, Bulletin No. 184, MCE Response: AEMC Review of a National Framework for Electricity Distribution Network Planning and Expansion, October 2010.

<sup>70</sup> AEMC, Review of National Framework for Electricity Distribution Network Planning and Expansion, September 2009, page 27.

<sup>71</sup> Australian Energy Regulator, Statement of Approach: Priorities and objectives of electricity network service provider performance reports, April 2011, page 11.

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4.86 The AER priorities for network service provider reporting are to:<sup>72</sup>

- report compliance with approved cost allocation methods, and elements of the regulatory determination, including service standards and incentive schemes;
- report forecast and actual outputs, including measures of network utilisation and asset age, to identify areas of performance that may be reviewed by the economic regulator;
- report forecast and actual capital and operating expenditure, and identify reasons for differences between forecast and actual expenditures;
- benchmark expenditure information to allow comparison of DNSP performance over time and between DNSP's, including in different jurisdictions;
- compare the DNSPs' network operations, including service standard levels and demand management information;
- provide comprehensive, accurate and reliable information, enabling stakeholders to undertake analysis of performance and have confidence in the results of that analysis. Provide information over time to enable trends to be identified and comparisons of changes in performance, outputs and expenditures to be made between DNSPs;
- report DNSP profitability, comparing businesses within and across jurisdictions and regulatory control periods; and
- report information that can be utilised for future distribution determinations, including information on cost drivers, expenditure trends, service levels and variations in network performance.

4.87 Adopting nationally consistent reporting arrangements in the Territory would promote transparency about expenditure, decision making and service levels. This would assist in holding PWC Networks accountable for reliability outcomes and strengthen incentives for improved performance.

4.88 These national reporting arrangements would increase the reporting requirements for PWC Networks. However, as noted by the AER, information reporting costs will be incrementally higher for DNSP's not currently subject to information reporting of a comparable standard to developing industry practice. PWC Networks is not currently obliged to report an equivalent level of information as is being required of DNSPs in the NEM (and already applies to DNSPs in some NEM jurisdictions) to reflect developing industry practice. Therefore, adopting good industry practice will increase the level and cost of reporting by PWC Networks.

4.89 The cost of additional reporting would be offset by enhanced oversight of planning and performance, thereby reducing the risk of the distribution network being degraded to a point where urgent remedial expenditure is required to avoid systemic asset failure. This oversight may also encourage PWC Networks to adopt more efficient processes and technologies to provide network services that meet reliability and quality of supply targets on a cost effective basis.

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<sup>72</sup> Australian Energy Regulator, Statement of Approach: Priorities and objectives of electricity network service provider performance reports, April 2011, page 12.

## Effectiveness of Territory distribution network reporting

- 4.90 DNSPs operating elsewhere in Australia are generally obliged to report on an annual basis. PWC Networks has supplied the Commission with a Network Planning and Reliability Report since 2009, in response to a Commission request for network planning and reliability information. Unlike other jurisdictions in Australia, the Territory's regulatory framework does not require the regular production of a report on network capability and future reliability performance.
- 4.91 Reporting on distribution network planning and performance in the Territory occurs through the Power System Review and standards of service reports.
- 4.92 More comprehensive and specific distribution network reporting requirements in the Territory would promote transparency about expenditure, decision making and service levels. This would assist in holding PWC Networks accountable for reliability performance outcomes relative the price and service expectations of the regulatory bargain and strengthen incentives for improved performance.
- 4.93 The overriding benefit would be enhanced oversight of planning and decision making, thereby reducing the risk of the distribution network being degraded to a point where urgent remedial expenditure is required to avoid systemic asset failure. The increased oversight may also encourage PWC Networks to adopt more efficient processes and technologies to provide network services that meet reliability and quality of supply targets on a cost effective basis.
- 4.94 The reporting framework would support network price determinations by providing regular, consistent and comprehensive data on network operation and performance.
- 4.95 There has been considerable work on reporting arrangements for the NEM. The Commission considers that the national network reporting requirements provide a sound basis for arrangements in the Territory. In particular, the Territory should be guided by the framework resulting from the AEMC Review of National Framework for Electricity Distribution Network Planning and Expansion and the AER Statement of Approach on network performance reporting.

## Draft recommendations – distribution network reporting

- 4.96 In the Draft Report, the Commission made two preliminary recommendations regarding distribution network reporting in the Territory.

### *Draft recommendation 6(a) – Development of framework for the reporting of comprehensive distribution network information*

- 4.97 The Commission recommended the development and implementation of a framework for the reporting of comprehensive and authoritative distribution network information to support acceptable reliability performance outcomes in the Territory's distribution networks. Information to be reported should include:
- a network planning and performance report, with the contents reflecting the purpose and characteristics of national arrangements; and
  - reliability outcomes experienced by customers.
- 4.98 The Commission considers that the national network reporting requirements (the national annual planning reports and AER network performance reports) could provide a sound basis for arrangements in the Territory

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*Draft recommendation 6(b) – Independence in preparing reports*

4.99 The Commission recommends that the reporting framework ensure appropriate independence in the preparation of reporting instruments. To ensure that reporting is both comprehensive and accurate there should be appropriate independent oversight of the reports, with the ability to test the accuracy of statements and assumptions. The responsible entity could be required to certify that the material presented is accurate (on a best endeavours basis).

**Views in submissions***Comments on draft recommendation 6(a) – Development of framework for the reporting of comprehensive distribution network information*

4.100 PWC was of the view that the development of a Network Management Plan and the annual Standards of Service reports should satisfy the requirements of this recommendation.

4.101 PWC considered that the scale of reporting requirements in the NEM was not appropriate for the Territory.

*Comments on draft recommendation 6(b) – Independence in preparing reports*

4.102 PWC was of the view that its accountabilities and internal processes provided adequate assurance of the accuracy of its regulatory reports. PWC also referred to audits being conducted to address any concerns regarding the information provided to the Commission.

4.103 QEnergy was supportive of the Commission's draft recommendations relating to distribution network reporting.

**Response to views in submissions and further analysis**

4.104 The Commission welcomes PWC's initiative to develop a Network Management Plan. The Commission has not had the opportunity to review the document and is not in a position to form a view on its adequacy and whether further information would be required.

4.105 The Commission agrees with PWC about the merits of independent audits. Conscious of the cost associated with independent audits and the need to obtain value for money from such audits, the Commission welcomes PWC's initiative to establish internal processes and accountabilities to ensure that accurate and timely information is provided when needed. It may also be appropriate for PWC and the Commission to further consider mechanisms that aim to increase confidence in the accuracy of information and minimise the need for audits, such as declarations signed by the PWC managers responsible for the information, attesting to the veracity of the information.

4.106 The Commission acknowledges PWC's concerns about the scale of the reporting requirements in the NEM. However, the Commission is of the view that the structure of the NEM arrangements is appropriate and the reporting instruments may be tailored to the Territory's circumstances.

**Final recommendation**

4.107 The Commission does not propose to make further changes to its recommendations relating to distribution reporting.

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## CHAPTER 5

### Implementation

#### Requirements of the terms of reference

- 5.1 The terms of reference require the Commission to recommend a course of action and provide detailed plans for implementation of that recommendation.
- 5.2 Implementation considerations include:
- options for implementing draft recommendations; and
  - assessment of costs and benefits of the proposed arrangements.

#### Options for implementing recommendations

- 5.3 The options for implementing the recommendations include:
- to establish a planning, monitoring and reporting framework using existing heads of power, such as those contained in the *Electricity Reform Act*, s45, and potentially the heads of power existing to apply a standards of service framework; and
  - to introduce the proposed arrangements through an Electricity Industry Code requiring the development of a planning, monitoring and reporting framework consistent with the Commission's proposals.
- 5.4 The proposed planning, monitoring and reporting arrangements might potentially be applied using authority under existing heads of power. For example, amongst other things, the *Electricity Reform Act*, s45 requires the Commission to report on the performance of the Territory's power system and distribution networks. The Commission may request industry participants to assist the Commission in this exercise. This provision might potentially provide the Commission with the ability to require the development and publication of reports detailing system and distribution network planning and monitoring information (as this information is relevant to performance).
- 5.5 However, arrangements of this nature are probably more appropriately established through explicit and specific instruments, such as an Electricity Industry Code. This approach would reflect the policy intent of the regulatory framework, and would create more certainty about the form and nature of the arrangements.
- 5.6 A more detailed course of action for implementation is being developed by Northern Territory Treasury in conjunction with the Commission.
- 5.7 It is expected that the first meeting of the implementation group will take place in February 2012.

#### Assessment of costs and benefits of proposed arrangements

- 5.8 This assessment of the costs and benefits of the proposed arrangements is necessarily qualitative as the data to quantify the costs and benefits is not currently available to the
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Commission. The assessment is based on the Commission's knowledge of experience and practice elsewhere in Australia.

- 5.9 The Commission recognises that the recommendations could increase the level and cost of planning, monitoring and reporting by the Territory electricity industry. However, the proposed arrangements are not for the sake of information gathering but, in line with good industry practice, as a necessary means to ensure a well run electricity sector that delivers an appropriate level of service at an appropriate price to customers. The obligations are no more than what should already be in place in a well-governed industry providing essential services.
- 5.10 In light of the Government's announcement of \$1.8 billion to be invested over the next five years on power, water and sewerage infrastructure<sup>73</sup>, the Commission is of the view that its recommendations on the implementation of efficient system and distribution planning, monitoring and reporting practices are particularly relevant.

*Assessment of costs and benefits of planning activities*

- 5.11 Planning involves costs for electricity businesses, such as by obtaining and maintaining the systems and capability to collect and report asset condition and performance data and to develop demand forecasts. However, these costs would be offset by the benefits arising from informed decisions that result in optimal investment outcomes.
- 5.12 Effective planning should result in effective asset management that involves a business investing in the right assets at the right time, exploiting assets appropriately and ultimately replacing assets at the end of their economic life. This approach should deliver a capital and maintenance program that delivers an electricity supply consistent with the reliability standards and the price and service expectations of the regulatory bargain.

*Assessment of costs and benefits of monitoring activities*

- 5.13 Monitoring, including incident reporting, should not require electricity businesses in the Territory or the System Controller to do anything that they would not already be doing as best practice in the normal course of operations. Compliance with technical obligations and investigating and documenting the cause and implications of power system incidents is a routine operating practice of a generator and system operator, and is critical to achieving desired reliability outcomes on a cost effective basis.
- 5.14 The data obtained through monitoring activities can provide forewarning of potential reliability or security problems along the electricity supply chain and should assist effective asset management.

*Assessment of costs and benefits of reporting*

- 5.15 Reporting involves costs to collect, analyse and report data. However, these costs should be offset by the benefits of having authoritative and comprehensive data when making investment decisions. Further, reporting should provide the electricity business with the data to properly justify and explain to customers, regulators and shareholders their revenue and price claims.

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<sup>73</sup> Northern Territory Government Budget 2011-12. Budget Speech, <http://www.budget.nt.gov.au/budget1.html>

**Views in submissions**

- 5.16 PWC stated in their submission that the Commission had not fully justified its recommendations in its Draft Report and had not provided detailed implementation plans. PWC was of the view that implementation details should be provided prior to finalising the report as changes could be sufficiently in advance.
- 5.17 PWC offered to assist the Commission in assessing the cost associated with its recommendations once greater details are provided.
- 5.18 Finally, PWC re-iterated the view that elements of the NEM's arrangements are not relevant or appropriate to the Territory context.

**Response to views in submissions and further analysis**

- 5.19 In response to PWC's concern about the absence of a detailed implementation plan, the Commission is not in a position to provide greater certainty as the Commission's recommendations from this review have not yet been considered or endorsed by the Territory Government. The implementation of the recommendations endorsed by Government could involve development of an implementation program and project plan by an implementation group comprising representatives of industry, policy and regulatory entities.
- 5.20 The Commission welcomes PWC's offer to assist the Commission in costing its recommendations. While upfront costs could arise, the Commission is of the view that, in the long run, the adoption of good industry practices will deliver appropriate efficient outcomes.
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