

2013-14 POWER SYSTEM REVIEW SUMMARY OF KEY FINDINGS

On an annual basis, the Utilities Commission (Commission) is required by the *Electricity Reform Act* to prepare a Power System Review (Review) that reports on power system performance and capacity for the Darwin-Katherine, Alice Springs and Tennant Creek power systems.

Regular and comprehensive reporting on power systems and the distribution network health and performance is a feature of the electricity supply industry elsewhere in Australia. Consistent with good electricity industry practice and noting the Northern Territory Government's regulatory reform agenda for the electricity market, the Commission continues to transition reporting requirements in the Territory to be consistent with those of the National Electricity Market.

For the 2013-14 Review, the Commission continues to focus on actual system availability (generation and networks) to assess the security and reliability of the system, including voltage, forced outage rates and spinning reserve.

The Commission undertook the 2013-14 Review with the assistance of specialist consultants Entura, Marsden Jacob Associates, and MDQ Consulting, and has relied significantly on information provided by electricity industry participants.

Key Findings

- The reliability of the Darwin-Katherine power system declined during 2013-14. On 12 March 2014, a System Black event occurred, following action taken by Power and Water Corporation (PWC) in response to a malfunctioning circuit breaker. The various responses to the System Black incident, including failures of black start generators, either exacerbated or extended the incident.
- In 2013-14, there were a significant number of generation-related load shedding events that were not due to insufficient generation capacity, but rather the response of some generator units (at times not being able to respond appropriately following an outage of a single generator unit).
- The Alice Springs power system performed better than that of Darwin-Katherine in 2013-14, with fewer generation-related load shedding events. Tennant Creek experienced a System Black event during the year, although the size of this power system and single power system supply suggests that such outages are not unexpected.
- The Commission is concerned that the customer benefit of power system performance in the Territory is not well defined. The value to customers of improved power system performance is an important planning tool and requires increased focus.
- There are critical aspects of the power system supply chain that have limited redundancy, and there are multiple examples of underperforming equipment. The 12 March 2014 System Black and the gas supply failure event of 11 September 2014 demonstrate a lack of system robustness in the Darwin-Katherine power system.
- In the previous Review, the Commission observed that many of the events in the power system were multiple contingency events. This was less of an issue in 2013-14 but there were nevertheless several significant events. Responses to major incidents appear to be mixed and the Commission is concerned that the level and effectiveness of contingency planning is lacking.
- The Commission projects average system-wide maximum demand growth to be 1.6 per cent for Darwin-Katherine, 1.0 per cent for Alice Springs and 1.7 per cent for Tennant Creek per annum over the 10-year review period.

- The number of households with rooftop photovoltaic (PV) installations is expected to increase uniformly over the next 10 years. By 2023-24, it is projected that households with rooftop PV installations will increase to 24.4 per cent in the Darwin-Katherine power system, 35.6 per cent in the Alice Springs power system and 26.6 per cent in Tennant Creek power system.

Generation Outlook

- PWC has adopted an N-3 (that is, the unavailability of the three largest generating units) planning criterion for the Darwin-Katherine power system as a temporary measure to allow for the life extension work at Channel Island power station. The planning criterion of N-2 and N were adopted for Alice Springs and Tennant Creek, respectively.
- Both the Darwin-Katherine and Alice Springs power systems have a high level of generation capacity to 2023-24, assuming a low 2 per cent forced outage rate for generators (92 per cent overall availability). The Tennant Creek power system can almost meet its standard with reliance on diesel generation (assuming no loss of gas supply) for the 10-year review period.
- Although generation capacity across the three regions remains strong, generation reliability remains poor and declined in 2013-14. There were 11 generation outages resulting in load shedding during 2013-14 in the Darwin-Katherine power system, three in Alice Springs and one in Tennant Creek.
- The Commission has previously recommended that PWC undertake a review of spinning reserve requirements and the Commission understands that this work is ongoing.

Fuel Supply

- The Territory has sufficient fuel supply for the 10-year review period. PWC's annual contract quantity from Blacktip is in excess of its actual gas requirements for the review period. An additional Inpex LNG back-up arrangement from 2017 will materially improve security of gas supply to the Territory.
- The emergency management of the 11 September event (gas supply failure following an electrical fault at the Blacktip gas platform) did not produce the most effective outcomes because there was not a process that enabled free flow of live information between all key stakeholders.

Network Outlook

- There is sufficient network capacity to meet future demand to 2023-24 subject to a number of capacity concerns, including:
 - six 11kV feeders exceeded 100 per cent utilisation during periods of maximum demand and this is expected to increase to nineteen 11kV and four 22kV feeders by 2018;
 - poor performance of the 132kV Channel Island to Hudson Creek line and/or its protection systems increases the risk of a System Black event; and
 - 'normal' and 'contingency' ratings that PWC Networks apply in evaluating adequacy of transmission lines is not consistent with the method used in other jurisdictions.
- Significant progress was made in the areas of:
 - the transmission line loop between Hudson Creek, Palmerston, McMinns, Weddell and Archer substations; and
 - network reliability (excluding the 12 March 2014 System Black event), feeder loadings and the number of poorly performing feeders (zero).

Customer Service

- There was continued poor performance in answering customer calls, with the number of calls abandoned increasing by over 128 per cent. The average time to answer a call also increased from 180 seconds to 371 seconds in 2013-14. The Commission considers this performance a significant concern and a matter that needs to be addressed as a high priority.
- The target standards for distribution System Average Interruption Duration and System Average Interruption Frequency were not met for all feeder categories except for the Rural Long feeder category.