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Professor Mary O'Kane
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Dear Professor O'Kane

Submission to the NSW Energy Security Taskforce

Thank you for providing the opportunity for Essential Energy to make a submission to the NSW Energy Security Taskforce on best practice long term energy security planning and management during heatwave conditions.

Our submission is attached.

In summary, it provides a general overview of Essential Energy's role during extreme weather and generation shortfall events, a review of our participation in the January and February 2017 events and recommendations aimed at improving future planning and response mechanisms.

Essential Energy welcomes any further opportunity to participate or provide assistance to the Taskforce as required.

If you or your officers have any questions in relation to this submission please contact Paul Brazier, Acting General Manager Asset Management, either by phone on 02 6589 8619, or e-mail via paul.brazier@essentialenergy.com.au.

Alternatively, if I can be of any assistance, please call me on 02 6589 8333.

Yours sincerely

A handwritten signature in black ink, appearing to be "John Cleland", written over a horizontal line.

John Cleland
Chief Executive Officer

Submission to the NSW Energy Security Taskforce



Essential Energy is a NSW Government-owned corporation with responsibility for building, operating and maintaining one of Australia's largest electricity networks – delivering essential electricity network services to more than 800,000 homes and businesses across 95 per cent of NSW and parts of southern Queensland.

Preparedness for heatwave conditions

Essential Energy has a range of strategies in place to manage its electricity distribution network and minimise customer impacts in the event of power supply interruptions or load issues during heatwave conditions.

Our electricity distribution network is designed and built to meet security and reliability requirements as specified in the Reliability and Performance Licence Conditions for Electricity Distributors issued by the NSW State Government and monitored by IPART.

The distribution network can be more heavily loaded during the summer period, impacted by factors such as population growth due to tourism and a general increase in air conditioning load. However, our experience is that demand is generally in line with predicted forecasts and expectations for summer.

Robust planning and load forecasting procedures are in place to identify emerging network constraints that may be impacted by the higher demand for electricity experienced over summer and winter periods. The forecasting methodology is in accordance with industry best practice processes and updated annually for publication in the Distribution Annual Planning Report as required in the National Electricity Rules.

During the extreme conditions experienced on 10 and 11 February 2017, the Essential Energy network experienced higher than normal demand. However, there were no significant parts of the network that were unable to meet this.

In addition to this Essential Energy has 24-hour, seven days a week network monitoring and management capability through our two Control Rooms. Typically, this capability is more regularly used to respond to events such as storms, floods or bushfires that may impact the network.

During periods when the network may be impacted by reduced generation or a transmission network outage, Essential Energy's Control Rooms co-ordinate and communicate with the appropriate agencies such as Transgrid and AEMO and Emergency Response Agencies.

Network technicians are available for dispatch to respond to any event that may occur.

Impact of severe weather events

Essential Energy's distribution network incorporates subtransmission and zone substation asset redundancies that provide a degree of natural resilience to weather events. However, distribution lines that service customers are mainly radial, with limited redundancy. Increased frequency of extreme weather events places the reliability performance of these assets at risk.

For example, the first two months of 2017 saw an increase of 11 per cent in the number of customer interruptions compared to the start of 2016. The duration of these interruptions was increased due to the extent of the damage to the network and the difficulty in rapidly accessing areas impacted by bushfires or floods to restore customers' supply.

Essential Energy's role in state-wide issues

Events such as a shortfall in generation capacity are outside the direct control of Essential Energy. However, they significantly impact the supply of energy to our customers.

Essential Energy receives advice from the Australian Energy Market Operator (AEMO) and Transgrid regarding forecast shortfalls in generation capacity and potential requirement for load shedding. Based on this advice, Essential Energy prepares for implementing load shedding as directed to do so in accordance with a pre-agreed plan.

Essential Energy works closely with AEMO and TransGrid and follows emergency communications protocols during any load shedding incidents. Essential Energy owns and maintains its own radio network to assist in this regard.

Resilient communication between control rooms and field technicians who may be carrying out switching is critical in successfully managing any load shedding event.

Stakeholder communications

Essential Energy's Customer Contact Centre is available to answer customer enquiries during working hours on 13 23 91, and our Supply Interruptions Line is available to manage customer enquiries 24 hours a day, seven days a week on 13 20 80. Updates on load shedding events are made available via the Essential Energy web page (www.essentialenergy.com.au), social media networks, and text messages to impacted customers.

If a major incident arises, Essential Energy provides communications to print and broadcast media, and updates to stakeholders including the general public, local Members of Parliament and Council Mayors and General Managers and Business Chambers.

Communication with customers during large scale events is a critical function for Essential Energy as there is an expectation from customers that Essential Energy will be a key source of information in regard to their supply status.

Response to January and February 2017 events

What went well

In regard to the extreme weather events during January and February 2017 the following items are highlighted as performing well and meeting the requirements of stakeholders:

- Proactive government communications to the community to provide advise and assurance in regard to predicted load shedding.
- Clarity in roles and responsibilities on the day of the event.
- Communications between AEMO, TransGrid and Essential Energy during the events. Essential Energy received timely, relevant information that enable it to meet its obligations and be prepared for likely outcomes during the day.
- The schedules and information previously prepared to assist in load shedding events contained sufficient information to allow loads to be prioritised.
- Essential Energy's internal communications provided employees with the information they required in a timely manner.
- External communication detailed the nature of the event and the actions being taken to address the matter. Major customers were contacted where possible and asked if they could voluntarily reduce load.
- The opportunity available to Essential Energy to reduce load and assist in mitigating the impact of the high demand by shedding controlled load was effectively implemented.

Opportunities for improvement

Employee training

Load shedding events are rare and employees may not have had recent exposure to lack of reserve incidents or system restart requirements. Routine training of operational personal in critical incident management needs to be carried out to ensure an appropriate response to these events. There is no training of this type mandated at present. TransGrid carries out some training for Distribution Network Service Provider (DNSP), generator and AEMO employees at present on an annual basis; however, numbers in these courses are limited.

Recommendation: A review of training requirements for critical incidents, with the goal of ensuring that sufficient numbers of relevant employees are provided with regular training and event management exercises.

Control room communications

Communications between control rooms and field operators is increasingly reliant on third party mobile services. However, these services are often susceptible to the same disruptions that impact the electricity network.

Recommendation: Review the reliability and resilience of third party communications networks such as those provided by Telstra.

Technology opportunities

Embedded Generation

There is approximately 500MW of embedded generation (excluding domestic roof top PV) within the Essential Energy network, primarily comprising solar PV and wind generation, but also including bio fuels, hydro-electric schemes and small scale thermal generation. However, this generation capacity could be constrained due to load shedding the sections of network where these resources are located when they could potentially be of most benefit to system security and operation

Under certain circumstances these resources could be utilised effectively to reduce system stress during lack of reserve events.

Presently, the islanding of generation at all levels is not allowed in the operation of the network.

Recommendation: Review load shedding protocols and schedules to ensure that small scale generation capacity is not removed from the network when it is required. Investigate the potential for islanding generation within the network during load shedding events to improve resilience of supply to the customers located within an island, noting the need to ensure that power quality and fault levels are maintained to allow safe and efficient operation.

Recommendation: Review under-frequency protection at all levels within the transmission and distribution networks to ensure that generation can 'ride through' reasonable system disturbances without being shed. Worst case scenario could see up to 350MW (not including roof top PV) of generation capacity shed at a time when it is potentially needed the most.