ELECTRICITY NETWORK PERFORMANCE REPORT 2010/2011

Submitted to: NSW Department of Trade and Investment, Regional Infrastructure and Services 2011

essential energy

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Profile

1.1 Overview

Essential Energy is a NSW Government-owned corporation with responsibility for building, operating and maintaining Australia's largest electricity network that spans 95 per cent of NSW, parts of southern Queensland and northern Victoria.

Our success is driven by commercial decisions that meet both local priorities and the needs of our customers, employees, stakeholders and shareholders.

We are committed to delivering safe and reliable essential services to more than 800,000 homes and businesses across regional NSW – and will invest around $6 billion in the five years to 2014 to refurbish and grow our electricity network to support regional development and cater for growing energy demands.

As part of this investment, we are transforming our existing ageing network into a responsive Intelligent Network of the 21st century – delivering cost-effective alternatives to traditional investment, improving reliability, supporting the growth of renewable energy and making energy efficiency simpler for customers

With medium to very low customer densities and wide variations in topography and climatic conditions, Essential Energy's electricity network is unique in Australia and includes:

- more than 200,000 kilometres of powerlines - 97 per cent of which are overhead and three per cent underground
- approximately 1.4 million power poles and approximately 140,000 streetlights
- approximately 134,000 distribution substations and more than 300 zone substations – with the majority remotely monitored and controlled by Supervisory Control and Data Acquisition (SCADA) systems
- a diverse range of sub-transmission and distribution types from single wire earth return (SWER) to single and three phase systems operating at voltage levels of 220 kV, 132 kV, 110 kV, 66 kV, 33 kV, 22 kV, 19.1 kV, 12.7 kV, 11 kV, 6.6 kV and 3.3 kV
- delivery of around 12,000 GWh of energy per year.

Essential Energy also provides water and sewerage services to more than 20,000 people in Far West NSW and offers energy efficiency advice and management solutions through its energyanswers program.

We are one of the largest employers in regional NSW with around 4,600 employees based in 147 depots and Essential Service Centres, eight regional offices and business centres in Sydney and Newcastle. Since 2001, we have created around 1,020 new apprenticeships and plan to employ a further 300 apprentices from 2011–2014 – delivering local employment opportunities and supporting regional economies.

With eight regional management teams, our decentralised management structure ensures that we can respond quickly and effectively to local needs and priorities. Our team members work in all types of conditions to deliver a 24-hour a day, seven-day a week service to the communities in which they work and live.

This local knowledge is central to our network investment strategy and ensures that we are well positioned to achieve our goal of being the leading provider of essential services in regional Australia and a trusted part of the 1,500 rural and regional communities that we serve.

Essential Energy's network distribution area

NOTE: References to distribution area boundaries within this document are correct as at 30 June 2011.

Table 1.1 Distributor Statistics

	Number at 30/6/10	Number at 30/6/11
Distribution customer numbers (Total)	801,913	803,889
Customer numbers at year end (North Western)	60,168	60,280
Customer numbers at year end (Southern)	115,308	115,391
Customer numbers at year end (Central Western)	94,144	94,307
Customer numbers at year end (Northern)	94,782	94,994
Customer numbers at year end (South Eastern)	120,081	120,372
Customer numbers at year end (Far North Coast)	139,294	139,804
Customer numbers at year end (Mid North Coast)	157,109	157,741
Customer numbers at year end (Far West)	21,026	21,000
Maximum demand (MW)	2,239	2,238
Feeder number CBD	0	0
Feeder number Urban	309	293
Feeder number Short Rural	828	897
Feeder numbers Long Rural	222	239
Energy received by dist network to year end GWh	12,670	12,900
Energy distributed to year end (Residential) GWh	4,675	4,879
Energy distributed to year end (Non residential including un-metered supplies) GWh	7,041	7,174
Energy distributed to year end (North Western) GWh	1,147	1,231
Energy distributed to year end (Southern) GWh	1,868	1,882
Energy distributed to year end (Central Western) GWh	2,540	2,528
Energy distributed to year end (Northern) GWh	1,355	1,426
Energy distributed to year end (South Eastern) GWh	1,272	1,336
Energy distributed to year end (Far North Coast) GWh	1,489	1,541
Energy distributed to year end (Mid North Coast) GWh	1,607	1,652
Energy distributed to year end (Far West) GWh	438	457
System Loss Factor (%)	7.5	6.6
Transmission system (km)	–	–
Transmission substation (number)[1]	20	20
Sub-transmission system (km)	12,352	11,391[2]
Substation – zone (number)	322	325
Substation – distribution (number)	134,524	134,947
High-voltage overhead (km)	144,661	145,835
High-voltage underground (km)	1,911	2,011
Low-voltage overhead (km)	26,939	26,652[3]
Low-voltage underground (km)	4,981	4,810[4]
Pole (number)	1,387,734	1,385,780[5]
Streetlights (number)	147,733	148,158
Employees (full-time equivalent number)	4,474	4,573
Contractors (full-time equivalent number)	454	545

Note: Distances for overhead and underground lines are circuit km.

[1]Essential Energy assumes any substation that converts to a voltage that is not used for distribution is a Transmission Substation.
[2] Sub-transmission system (km) numbers have decreased marginally year on year due to data cleansing and validation.
[3] Low-voltage overhead (km) numbers have decreased due to data cleansing and validation as part of Essential Energy's LV Data Capture project.
[4] Low-voltage underground (km) numbers have decreased due to data cleansing and validation as part of Essential Energy's LV Data Capture project.
[5] Pole (numbers) have decreased year on year due to data cleansing and validation. Essential Energy's Network Asset Team (NAS) continues to work closely with Asset Inspectors in identifying and correcting any data related issues in the asset management system.

1.2 Capital Works Program

Essential Energy is planning to deliver the capital works program as approved in the current five-year regulatory control period. Annual variations to the original plan will occur due to capital expenditure timing variations. However, the plan is to meet the determination outcome over the five years. Variations have generally been the result of the time required to increase project delivery capability, delays to major project delivery due to weather and planned changes to meet actual network needs.

Table 1.2 Capital Works Program Trend

Year	2006–2007	2007–2008	2008–2009	2009–2010	2010–2011
Capital works program ($M)	441.8	473.3	563.6	608.7	748.4

2

Network Management

2.1 Overview

Essential Energy manages a complex and geographically diverse power supply network. Our distribution area is one of the largest in the world. To ensure our decisions are localised and reflect the needs and concerns of the local population, the network is managed through a regional management structure.

Essential Energy's Network Asset Management Plan has been put in place to meet its statutory and public responsibilities and to provide a safe, reliable and sustainable electricity supply to our customers. The plan is divided into four chapters:

- **Network Safety and Reliability:** aims to establish a framework that ensures Essential Energy's sub-transmission and distribution system provides an adequate, reliable and safe supply of electricity of appropriate quality. The plan is revised regularly and management and operations employees are audited to ensure work practices are in accordance with the objectives of the plan (See Sections 3 and 4).
- **Customer Installation Safety Plan:** ensures provision of safe electrical installations within Essential Energy's network area and the safe connection to Essential Energy's sub-transmission and distribution system to help provide a safe working environment for our employees, service providers, contractors, customers and the general public (See Section 6).
- **Public Electrical Safety Awareness Plan:** provides a framework and strategies to warn the public of the hazards associated with electricity and, in particular, the hazards associated with overhead powerlines, and to provide simple but effective ways to minimise their risk exposure (See Section 9).
- **Bush Fire Risk Management Plan:** aims to ensure that Essential Energy's assets are managed in a way that will minimise the risk of bush fires, as well as protect our assets and maintain customer supply reliability at times of bushfire (See Section 8).
- Essential Energy's commitment to safety management procedures can also be seen in its continuous improvements in safety measures (See Section 5).

2.2 Network Complaints

Table 2.1 Complaint Performance Data

Year	2006–2007	2007–2008	2008–2009	2009–2010	2010–2011
Complaints Total	2,046	2,327	3,232	3,599	5,301
Complaints per 1,000 Distribution Customers	2.7	3.0	4.2	4.5	6.6
Complaints Regarding Vegetation Management	152	164	169	234	328

The year saw a rise in the total number of complaints received, with a significant increase in the number of complaints surrounding planned supply interruptions, necessary to safely deliver Essential Energy's five-year Network Plan.

There was a significant number of complaints around quality of supply issues as a result of the increase in embedded generation in the network which can be directly attributed to the NSW Solar Bonus Scheme.

Table 2.2 Network Complaint Investigations Completed Current Year

Category	Nature of Complaint	Number	Number Valid
Voltage	Sustained over voltage	161	107
	Sustained under voltage	89	50
	Voltage fluctuations	327	112
	Voltage dips	72	38
	Switching transients	1	0
	N-E voltage difference	30	16
	Ground fault voltage	6	4
	Voltage unbalance	6	1
	Mains signalling voltages (Outside defined range)	0	0
	HV injection (HV/LV Intermix)	0	0
	Notching	0	0
	Invalid	364	
Sub Total (Supply Voltage Complaints)		**692**	**328**
Current	Direct current	0	0
	Harmonic content	1	0
	Inter Harmonics	0	0
	Invalid	1	
Sub Total (Supply Current Complaints)		**1**	**0**
Other Quality	Mains signalling reliability	0	0
	Noise and Interference	94	42
	Level of supply capacity	30	22
	Embedded Generation (Solar)	166	116
	Embedded Generation (Wind)	11	3
	Supply frequency	7	7
	Level of EMF	2	1
	Invalid	119	
Sub Total (Other Quality of Supply Complaints)		**310**	**191**
Sub Total (All Quality of Supply Complaints)		**1003**	**519**

Reliability	No. of supply failures	56	43
	Duration of supply failures	4	3
	Outages Miscellaneous	42	30
	No. of <1 min. interruptions	136	90
	Invalid	72	
Sub Total (Reliability of Supply)		**238**	**166**
Safety	Overhead line safety	0	0
	Underground safety	0	0
	Electrical station safety	0	0
	Service line safety	0	0
	Invalid	0	0
Sub Total (Network Safety)		**0**	**0**
Total Completed		1241	685
Other	**Under Investigation (not validated)**	**319**	
Total		1560	

2.3 Customer Service Standards Reporting

Table 2.3 Customer Service Standards Current Year Data

	Payments Given Based on Interruption Duration (Total Number)	Claims Not Paid Based on Interruption Duration (Total Number)	Payments Given Based on Interruption Frequency (Total Number)	Claims Not Paid Based on Interruption Frequency (Total Number)
Metropolitan	NA	NA	NA	NA
Non-Metropolitan	5	14	0	16

Table 2.3 shows a total of 14 claims not paid, based on iInterruption duration and 16 based on interruption frequency.

Claims based on duration were denied for the following reasons:

- seven occurred during severe weather events
- six where the outage was less than 18 hours
- one where the region was declared a natural disaster.

Claims based on frequency were denied for the following reasons:

- thirteen due to the customers premise having less than four outages recorded
- three due to severe weather and third-party incidents.

3

Network Planning

3.1 Overview

Essential Energy is committed to providing a safe, secure and reliable supply of energy in a cost-effective manner. Essential Energy achieves this by planning its network and making investment decisions in line with our CEK8018 Network Asset Management Plan (NAMP).

The NAMP outlines Essential Energy's obligations in relation to network planning, including the need to compile and publish an annual Electricity System Development Review (ESDR). The NAMP has been prepared in accordance with the compliance obligations of network management legislation, regulations and related codes of practice, and reflects recognised industry best practices and standards relating to the management of electricity infrastructure assets. It is designed to conform with the NSW Government policy and planning guidelines on total asset management, which addresses strategic planning relating to capital investments, renewal and maintenance.

Essential Energy's network development is undertaken in accordance with the *Electricity Supply Act,* the National Electricity Code, the NSW Code of Practice: Demand Management for Electricity Distributors and our policy CEOP8003 sub-transmission and Distribution Network Planning Criteria and Guidelines.

In general, Essential Energy plans the development of its network to ensure:

- network capacity is adequate to meet power transfer requirements
- electrical and thermal design ratings (normal and overload) of equipment are not exceeded
- supply reliability is in accordance with published standards, or as negotiated to meet the special requirements of individual major network customers
- quality of supply meets published standards and system voltage levels are maintained within acceptable standard limits
- safety standards are maintained or exceeded
- environmental constraints are satisfied
- the above requirements are met in a cost effective manner.

3.2 Design Planning Criteria Compliance Reporting

In August 2005, the Minister for Energy and Utilities introduced new licence conditions that included requirements for planning and design of sub-transmission and distribution networks.

Following a review of the licence conditions conducted by the Minister, the conditions were replaced with updated and revised conditions with effect from 1 December 2007.

The design planning criteria set out:

- input standards to be used by a licence holder in planning its network
- requirements for load forecasting and contingency planning methodologies intended to achieve operational outcomes.

The baseline levels of planned redundancy, required under the design planning criteria, underpin Essential Energy's plans for the network to ensure, as far as is reasonably practicable, that:

- the reliability standards are met
- an adequate supply, with an appropriate level of redundancy consistent with its regulatory obligations, is provided.

The design planning criteria applicable to Essential Energy are listed in Table 3.1.

Table 3.1 Design Planning Criteria

Network Element	Load Type	Forecast Demand or Expected Demand	Security Standard	Customer Interruption Time
Sub-transmission line	Urban and non urban	≥ 15 MVA	N-1[1]	< 1 minute
	Urban and non urban	< 15 MVA	N[2]	Best practice repair time
Sub-transmission substation	Urban and non urban	Any	N-1	< 1 minute
Zone substation	Urban and non urban	≥ 15 MVA	N-1[1]	< 1 minute
	Urban and non rrban	< 15 MVA	N[2]	Best practice repair time
Distribution feeder	Urban (regional centres)[4]	Any	N-1[3]	< 4 Hours
	Urban (other) and Non-Urban	Any	N	Best practice repair time
Distribution substation	Urban and non urban	Any	N	Best practice repair time

Notes:

1. For a sub-transmission line – Overhead and a Zone Substation:
   a. Under N-1 conditions, the forecast demand is not to exceed the thermal capacity for more than 1 per cent of the time i.e. a total aggregate time of 88 hours per annum, up to a maximum of 20 per cent above the thermal capacity under N-1 conditions. For Essential Energy, in other than regional centres, the forecast demand must not exceed the thermal capacity under N-1 conditions.
   b. Under N conditions, a further criterion is that the thermal capacity is required to meet at least 115 per cent of forecast demand.

   For a sub-transmission line: Underground, any overhead section may be designed as if it were a sub-transmission line; overhead, providing the forecast demand does not exceed the thermal capacity of the underground section at any time under N-1 conditions.
2. Under N conditions, thermal capacity is to be provided for greater than 115 per cent of forecast demand.
3. By 30 June 2014, expected demand is to be no more than 80 per cent of feeder thermal capacity (under system normal operating conditions) with switchable interconnection to adjacent feeders enabling restoration for an unplanned network element failure. By 30 June 2019, expected demand is to be no more than 75 per cent of feeder thermal capacity. In order to achieve compliance, feeder reinforcement projects may need to be undertaken over more than one regulatory period. In those cases, where a number of feeders form an interrelated system (such as a meshed network), the limits apply to the average loading of the feeders within the one system.
4. Regional centre means: Albury, Armidale, Ballina, Bathurst, Broken Hill, Coffs Harbour (including Sawtell), Dubbo, Forster-Tuncurry, Goulburn, Grafton, Griffith, Lismore, Orange, Port Macquarie, Queanbeyan, Tamworth, Taree, Tweed Heads and Wagga Wagga.

3.2.1 Design Planning Criteria Compliance Reporting

Sub-transmission planning

The planning criterion considers the adequacy of the sub-transmission network not only to meet the energy demand requirement, but also its capability to do so within component electrical and thermal ratings and voltage limits. Analysis is carried out to generally achieve an economically efficient outcome in which the sub-transmission network is secure and within rating following the forced outage of any single circuit line or substation element during peak periods.

Provision is also made for use of the short-time capability or cyclic rating of transformers during a planned outage of a parallel transformer.

Other sub-transmission planning criteria outline that:

- network equipment is designed to withstand maximum fault duty
- any sub-transmission fault is seen by at least two protection systems that are fully independent.

Each potential augmentation project is treated on its own merits. The main economic impact of sub-transmission investment is on a reduction in the value of the energy not supplied (the 'unserved energy'), an extension of the time taken for capacity limits to be exceeded and the initial capital costs. These are quantified over the expected life of the project and costed at appropriate rates.

Planning of the sub-transmission network is usually carried out over a longer time horizon of between five to ten years. Essential Energy distinguishes between long-term and short-term network planning, with long-term network planning generally confined to 132 kV and 66 kV networks. Short-term network planning is usually limited to networks ranging from 11 to 33 kV, with a horizon period of up to five years.

Primary distribution planning

The planning and capital investment framework associated with Essential Energy's distribution network is principally driven by technical considerations and requirements. This is primarily due to the inherent geographical challenges, our commitment to providing customers with published standards of reliability and quality of supply and structure of the network which is essentially radial.

Distribution network planning is generally of a short-term nature – up to five years. Essential Energy's traditional approach to distribution network planning has been to focus on feeder augmentation works to provide supply to new or growing loads, maintain adequate voltage regulation, enhance reliability of supply, upgrade thermal capacity (and minimise system losses) and comply with statutory delegations. This form of distribution planning criteria will continue.

Table 3.2 Sub-transmission Lines and Substations and Zone Substations Not Complying with the Design Planning Criteria on 1 July of the Current Year

Element including Location, Customer Numbers, Element Length/Capacity	Description of Non Compliance and Reason	Proposed Remedial Actions and Timetable
Forbes-West Jemalong 66 kV feeder (37km) 7,000 customers Central West region	N-1 ≥ 15 MVA sub-transmission feeder. Radial 66 kV feeder with peak demand of 15 MVA, outage of 66 kV feeder leads to loss of supply to all customers	Construct a second Forbes-West Jemalong 66 kV feeder, expected completion 2012–13
TransGrid-Orange South-Orange West 66 kV feeders (20km) 12,000 customers Central West region	N-1 ≥ 15 MVA sub-transmission feeder. Orange South and Orange West both have peak demands above 15 MVA, 66 kV feeders cannot be restored within 1 minute during contingency	Augment Orange South and Orange West zone substation, add 66 kV feeder bays, expected completion 2013–14
Bathurst Russell St zone substation 8,000 customers Central West region	N-1 ≥ 15 MVA zone substation. Russell St zone substation has a firm transformer capacity of 20 MVA with a peak demand of 26 MVA	Augment Russell St zone substation to 30 MVA capacity, transfer load to adjacent zone substation, expected completion 2012–13
TransGrid-Parkes 66 kV feeder (12km) 7,000 customers Central West region	N-1 ≥ 15 MVA sub-transmission feeder. 66 kV feeder has peak demand of 20 MVA. Outage of 66 kV feeder results in overload of remaining in-service 66 kV feeders	Construct a second 66 kV feeder to Parkes Town, expected completion 2012–13
Temora-Thanowring 66 kV feeder (8km) 7,000 customers Central West region	N-1 ≥ 15 MVA sub-transmission feeder. Radial 66 kV feeder with peak demand of 15 MVA, outage of 66 kV feeder leads to loss of supply to all customers	Construct a second Temora-Thanowring 66 kV feeder. Removed due to revised load data.
Koolkhan-Maclean 66 kV feeder (36km) 11,000 customers Far North Coast region	N-1 ≥ 15 MVA sub-transmission feeder. Radial 66 kV feeder with peak demand above 20 MVA, outage of 66 kV feeder leads to loss of supply to all customers	Construct a second Koolkhan-MacLean 66 kV feeder, expected completion 2011–12
Lismore 132 kV-Lismore South 66 kV feeders (2x3km) 17,000 customers Far North Coast region	N-1 ≥ 15 MVA sub-transmission feeder. 66 kV network to Lismore South has peak demand of 35+ MVA. Outage of 66 kV feeder results in overload of remaining in-service 66 kV feeder	Augment Lismore 132 kV-Lismore South 66 kV feeders, expected completion 2011–12
Ewingsdale-Mullumbimby 66 kV feeder (13km) 20,000 customers Far North Coast region	N-1 ≥ 15 MVA sub-transmission feeder. Outage of 66 kV feeder results in voltage levels below standard and overload of remaining in-service 66 kV feeders	Staged conversion of 66 kV network to 132 kV, expected completion of Stage 1 in 2012–13
Merbein-Dareton 66 kV feeder (Buronga load) Far West region	N-1 ≥ 15 MVA sub-transmission feeder. 66 kV radial feeder with a peak demand of 30+ MVA. Outage of 66 kV feeder leads to loss of supply to all customers	Establish Buronga 66/22 kV zone substation, construct 66 kV feeder from Gol Gol to Buronga, reconfigure 22 kV feeder to 66 kV, expected completion 2011–/12
Karangi-Coffs Harbour North 66 kV feeder (11km) 10,000 customers Mid North Coast region	N-1 ≥ 15 MVA sub-transmission feeder. 66 kV feeder has peak demand of 30 MVA. Outage of 66 kV feeder results in overload of remaining in-service 66 kV feeders and below standard low voltage levels	Construct a Coffs Harbour North-Coffs Harbour South 66 kV feeder, expected completion 2012–13

Element including Location, Customer Numbers, Element Length/Capacity	Description of Non Compliance and Reason	Proposed Remedial Actions and Timetable
Stroud-Gloucester 33 kV feeders (2 x 40km) 4,000 customers Mid North Coast region	N-1 ≥ 15 MVA sub-transmission feeder. 33 kV feeders have peak demand of 15 MVA. Outage of 33 kV feeder results in voltage levels below standard and overload of remaining in-service 33 kV feeder	Establish a 33 kV switching station at Wards River. This has been completed
Taree-Kew 66 kV feeder (45km) 7,000 customers Mid North Coast Region	N-1 ≥ 15 MVA sub-transmission feeder. 66 kV feeder has peak demand of 15 MVA. Outage of 66 kV feeder results in voltage levels below standard and overload of remaining in-service 66 kV feeder	Establish a 132/66/11 kV transmission substation at Herons Creek, expected completion 2014–15
Taree-Failford-Tuncurry-Forster-Bohnock 66 kV feeders (100km) 18,000 customers Mid North Coast region	N-1 ≥ 15 MVA sub-transmission feeder. 66 kV feeders have peak demand of 40+ MVA. Outage of 66 kV feeder results in voltage levels below standard and overload of remaining in-service 66 kV feeders	Establish a 132/66 kV transmission substation at Hallidays Pt and construct interconnecting 66 kV feeders, expected completion 2012–13
Forster-Tuncurry 66 kV feeder (8km) 9,000 customers Mid North Coast region	N-1 ≥ 15 MVA sub-transmission feeder. 66 kV feeders have peak demand of 20 MVA. Outage of 66 kV feeder results in overload of remaining in-service 66 kV feeder	Replace existing 66 kV feeder river crossing with 66 kV cable on bridge. This has been completed
TransGrid-Glen Innes 66 kV feeder (9km) 7,000 customers Northern Region	N-1 ≥ 15 MVA sub-transmission feeder. 66 kV feeder has peak demand of 15 MVA. Limited capacity of remaining in-service 66 kV feeder	Construct a second TransGrid-Glen Innes 66 kV feeder in joint planning with TransGrid 132 kV constraints. This has been completed
TransGrid-Gunnedah 66 kV feeders (2 x 12km) 7,000 customers Northern Region	N-1 ≥ 15 MVA sub-transmission feeder. 66 kV feeders have peak demand of 23 MVA. Outage of 66 kV feeder results in overload of remaining in-service 66 kV feeder	Upgrade TransGrid-Gunnedah 66 kV feeders. This has been completed
Borthwick St-Wynne St 66 kV feeder, Wynne St zone substation 8,000 customers Northern Region	N-1 ≥ 15 MVA sub-transmission feeder and N-1 ≥ 15 MVA zone substation. Wynne St substation with a peak demand of 25 MVA is controlled by single 66 kV circuit breaker at Borthwick St. Transformer or feeder fault leads to loss of supply to all customers with restoration greater than 1 minute	Augment Wynne St and Borthwick St substations and Ashford 66 kV feeder to Wynne St, expected completion 2012–13
TransGrid-South Tamworth-Oxley Vale 66 kV feeders (25km) 11,000 customers Northern Region	N-1 ≥ 15 MVA sub-transmission feeder. 66 kV feeders have peak demand of 40 MVA. Outage of 66 kV feeder results in overload of remaining in-service 66 kV feeders and supply cannot be restored in 1 minute	Augment TransGrid - South Tamworth - Oxley Vale feeders and configure substation to 66 kV 'ring' network, expected completion 2011–12
TransGrid-Goddard Lane 66 kV feeder (10km) 5,000 customers Northern Region	N-1 ≥ 15 MVA sub-transmission feeder. Radial 66 kV feeder with peak demand above 15 MVA, outage of 66 kV feeder leads to loss of supply to all customers	Construct a second TransGrid-Goddard Lane 66 kV feeder, expected completion 2011–12

Element including Location, Customer Numbers, Element Length/Capacity	Description of Non Compliance and Reason	Proposed Remedial Actions and Timetable
TransGrid-Quirindi 66 kV feeder (56km) 7,000 customers Northern region	N-1 ≥ 15 MVA sub-transmission feeder. Radial 66 kV feeder with peak demand of 15 MVA, outage of 66 kV feeder leads to loss of supply to all customers	Construct a second TransGrid-Quirindi 66 kV feeder, expected completion 2013–14
Beryl-Mudgee (tee) 132 kV feeder (35km) 9,000 customers North West region	N-1 ≥ 15 MVA sub-transmission feeder. 132 kV feeder has peak demand of 25 MVA. Outage of 132 kV feeder results in overload of remaining in-service 66 kV feeder	Augment Beryl-Mudgee sub-transmission network, expected completion 2012–13
Beryl-Dunedoo 66 kV feeder (41km) 7,000 customers North West region	N-1 ≥ 15 MVA sub-transmission feeder. Radial 66 kV feeder with peak demand above 15 MVA, outage of 66 kV feeder leads to loss of supply to all customers	Construct a second Beryl-Dunedoo 66 kV feeder, expected completion 2012–13
Nyngan-Cobar 66 kV feeder (130km) 4,000 customers North West region	N sub-transmission feeder. Radial 66 kV feeder with voltage levels below standard during system normal operation	Install a 66 kV regulator on Nyngan Cobar 66 kV feeder, expected completion 2013–14
Dubbo-Yarrandale 66 kV feeder (5.5km) 9,000 customers North West region	N-1 ≥ 15 MVA sub-transmission feeder. Radial 66 kV feeder with peak demand above 15 MVA, outage of 66 kV feeder leads to loss of supply to all customers	Construct a second Dubbo-Yarrandale 66 kV feeder, expected completion 2011–12
Yarrandale-Gilgandra 66 kV feeder (65km) 5,000 customers North West region	N-1 ≥ 15 MVA sub-transmission feeder. Radial 66 kV feeder with peak demand above 15 MVA, outage of 66 kV feeder leads to loss of supply to all customers	Construct a second Yarrandale-Gilgandra 66 kV feeder, expected completion 2012–13
Wellington-Dubbo 132 kV feeders (2 x 47km) 70,000 customers North West region	N-1 ≥ 15 MVA transmission feeder. 132 kV feeder with peak demand above 150 MVA, outage of a 132 kV feeder leads to overload of remaining in-service 132 kV feeder	Construct a Wellington-Narromine 132 kV feeder, expected completion 2013–14
Narromine-Dubbo West sub-transmission network 6,000 customers North West region	N-1 ≥ 15 MVA zone substation. Dubbo West approaching 15 MVA, currently supplied via a radial from Dubbo 132 to West Dubbo and to Narromine, provides N-1 by a 66 kV supply at Narromine, via the establishment of a 132/66 kV transformer. A switched 132 kV busbar will provide a connection point for a future Wellington - Narromine 132 kV feeder	Establish a 132/66 kV transmission substation at Narromine 132 kV tee, expected completion 2011–12
Yarrandale zone substation 4,000 customers North West region	Yarrandale has a single 10 MVA transformer with peak demand approaching 10 MVA, and expected additional load, a larger transformer and another transformer is required. A new second 66 kV feeder from Dubbo 132 kV to Yarrandale requires 66 kV feeder bays at Yarrandale	Augment Yarrandale zone substation, expected completion 2011–12
Bega-Pambula-Eden South 66 kV feeder (60km) South Eastern Region	N-1 ≥ 15 MVA sub-transmission feeder. 66 kV radial feeder with a peak demand of 20+ MVA. Outage of 66 kV feeder leads to loss of supply to all customers	Construct second Bega-Eden South 66 kV feeder over redundant 33 kV easement, expected completion 2011–12

Element including Location, Customer Numbers, Element Length/Capacity	Description of Non Compliance and Reason	Proposed Remedial Actions and Timetable
Cooma-Bega 132 kV feeder (92km) and Cooma-Bombala-Bega 66 kV feeder (96km) 23,000 customers South East region	N-1 ≥ 15 MVA sub-transmission feeders. 132 kV and 66 kV network with peak demand of 50 MVA. Outage of 132 kV feeder leads to overload of 66 kV feeder, results in loss load of 30+ MVA	Construct a Cooma-Bega dual 132/66 kV feeder on existing 66 kV easement, expected completion 2012–13
Evans Lane-Batemans Bay 132 kV feeder (57km) 25,000 customers South Eastern region	N-1 ≥ 15 MVA sub-transmission feeder. 132 kV network with peak demand of 50+ MVA. Outage of 132 kV feeder leads to extreme low voltage levels and possible voltage collapse	Rebuild smaller 132 kV feeder with larger conductor and staged power factor correction, expected completion 2012–13. (Project may change dependant on projects in Integral Energy 132 kV network)
Mulwala-Finley 132 kV and 66 kV feeders (60km) 7,000 customers Southern region	N-1 ≥ 15 MVA sub-transmission feeders. Both Finley zone substation and Mulwala 132/66 kV substation have demands above 15 MVA. On loss of the 132 kV feeder to Mulwala and the 66 kV feeder to Finley, the remaining in-service feeder is overloaded	Establish a 132/22 kV substation at Mulwala, construct a 132 kV feeder from Mulwala tee to new 132/22 kV substation, construct 132/66 kV dual feeder from Finley 132 kV to Finley zone substation, convert 66 kV Finley-Mulwala feeder to 132 kV, expected completion 2011–12
Griffith 33 kV feeders (37km) 12,000 customers Southern region	N-1 ≥ 15 MVA sub-transmission feeders. 33 kV feeders have peak demand above 15 MVA. Outage of 33 kV feeder results in overload of remaining in-service 33 kV feeders	Initially construct 132 kV feeder operated at 33 kV. Establish a Griffith West 132/33 kV transmission substation and 33 kV feeder interconnections into the long term, expected initial feeder completion 2012–13
Deniliquin-Moama 66 kV feeder (70km) 4,000 customers Southern Region	N-1 ≥ 15 MVA sub-transmission feeder. 66 kV radial feeder with a peak demand of 15+ MVA. Outage of 66 kV feeder leads to loss of supply to all customers	Construct a second Deniliquin to Moama 66 kV feeder, expected completion 2011–12
Ashmont zone substation 15,000 customers (Wagga City) Southern Region	N-1 ≥ 15 MVA sub-transmission feeders. The Wagga Wagga city 66 kV network is arranged in a 'ladder' formation, with some zone substations not having incoming 66 kV feeder or 66 kV transformer protection. Up to four zone substations can be affected by a single feeder or transformer fault. Restoration of supply within 1 minute is not possible	Augment Ashmont substation to fully switched 66 kV substation and construct 66 kV feeder connection, expected completion 2011–12
Wagga-Temora 132 kV feeder (80km) 9,000 customers Southern Region	N-1 ≥ 15 MVA sub-transmission feeder. 132 kV feeder with limited 66 kV backup, Peak demand of 50 MVA. Outage of 132 kV feeder leads to overload of 66 kV feeder and results in loss load of 20+ MVA	Rebuild existing Wagga-Junee-Temora 66 kV feeder as 132/66 kV dual circuit, expected completion 2012–13

Element including Location, Customer Numbers, Element Length/Capacity	Description of Non Compliance and Reason	Proposed Remedial Actions and Timetable
Wagga Wagga-Lockhart-Kywong-Narrandera-Yanco 66 kV feeder (85km) 5,000 customers Southern region	N-1 ≥ 15 MVA sub-transmission feeder. 66 kV backup to Narrandera limited by low voltage levels	Install a 66 kV regulator on Wagga Wagga-Narrandera 66 kV feeder near Lockhart. This has been completed.
Bourkelands zone substation 15,000 customers (Wagga Wagga) Southern region	N-1 ≥ 15 MVA sub-transmission feeders. The Wagga Wagga 66 kV network is arranged in a 'ladder' formation, with some zone substations not having incoming 66 kV feeder or 66 kV transformer protection. Up to four zone substations can be affected by a single feeder or transformer fault. Restoration of supply within 1 minute is not possible	Augment Bourkelands substation with fully switched in/out 66 kV busbar and construct Ashmont to Bourkelands 66 kV line – expected completion 2011–12
Bomen zone substation 15,000 customers (Wagga Wagga) Southern region	N-1 ≥ 15 MVA sub-transmission feeders. The Wagga Wagga 66 kV network is arranged in a 'ladder' formation, with some zone substations not having incoming 66 kV feeder or 66 kV transformer protection. Up to four zone substations can be affected by a single feeder or transformer fault. Restoration of supply within 1 minute is not possible	Augment Bomen substation. This has been completed.
Cartwrights Hill zone substation 15,000 customers (Wagga Wagga) Southern region	N-1 ≥ 15 MVA sub-transmission feeders. The Wagga city 66 kV network is arranged in a 'ladder' formation, with some zone substations not having incoming 66 kV feeder or 66 kV transformer protection. Up to four zone substations can be affected by a single feeder or transformer fault. Restoration of supply within 1 minute is not possible	Augment Cartwrights Hill substation with fully switched in/out 66 kV busbar, expected completion 2012–13
Wagga-Uranquinty 66 kV feeder (19km) 7,000 customers Southern Region	N-1 ≥ 15 MVA sub-transmission feeder. Radial 66 kV feeder with peak demand of 18 MVA, outage of 66 kV feeder leads to loss of supply to all customers	Construct Bourkelands - Uranquinty 66 kV feeder and augment Uranquinty 66 kV busbar, expected completion 2012–13
Wagga Wagga city network 66 kV feeders (5km) 15,000 customers (Wagga Wagga) Southern region	N-1 ≥ 15 MVA sub-transmission feeders. The Wagga Wagga city 66 kV network is arranged in a 'ladder' formation, with some zone substations not having incoming 66 kV feeder or 66 kV transformer protection. Up to four zone substations can be affected by a single feeder or transformer fault. Restoration of supply within 1 minute is not possible.	Construct a number of short 66 kV feeders between zone substations at Ashmont, Bomen and Cartwrights Hill, expected completion 2011–12.

Table 3.3 Distribution Feeder Summary Report by Class of Network Elements Not Complying with the Design Planning Criteria on 1 July of the Current Year

N-1 Regional Centres

Total Number of Feeders	Number of Feeders Without N-1 Capability (1 Minute)	Description and Reason for Non Compliance	Proposed Remedial Actions and Timetable
293	133	Inadequate feeder thermal ratings, lack of interconnectors, underrated interconnecting switchgear	Upgraded and additional feeders, construction of interconnectors, upgrading and additional interconnecting switchgear (gas switches, reclosers). N-1 programs have been set and are scheduled to be completed by 2014 or 2019. There are currently 278 programs of work scheduled, of which 145 have been completed.

Urban

Total Number of Feeders	Number of Feeders Without N Capability	Description and Reason for Non Compliance	Proposed Remedial Actions and Timetable
As above	As above	As above	As above

Non-urban

Total Number of Feeders	Number of Feeders Without N Capability	Description and Reason for Non Compliance	Proposed Remedial Actions and Timetable
1136	71	Insufficient capacity due to incremental growth	As N capability is exceeded, remedial plans will be developed accordingly. All feeders without N Capability have augmentation works programmed (50 projects completed in 2010–11.

Table 3.4 Distribution Substation Summary Report by Class of Network Elements Not Complying with the Design Planning Criteria on 1 July of the Current Year

CBD

Total Number of Substations	Number of Substations Without N-1 Capability (1 Minute)	Description and Reason for Non Compliance	Proposed Remedial Actions and Timetable
Not Applicable	Not Applicable	Not Applicable	Not Applicable

Urban and Non-urban

Total Number of Feeders	Number of Feeders Without N Capability	Description and Reason for Non Compliance	Proposed Remedial Actions and Timetable
134,947	163	Incremental lifestyle growth	Substations programmed to be upgraded when identified. 99 projects completed.

3.3 Demand Management

Essential Energy has implemented internal procedures to comply with the NSW Code of Practice: Demand Management for Electricity Distributors and the National Electricity Rules. This ensures the network planning process is transparent, consultative and equitable in the treatment of non-network alternatives relative to traditional network augmentation.

The process includes:

- publication of the Annual Electricity System Development Review
- maintenance of a Register of Interested Parties
- review of emerging constraints with a network augmentation in excess of $1 million
- screening of all distribution projects with an augmentation component in excess of $250,000
- publication of Consultation Papers via AEMO and Essential Energy external web pages
- notification to Interested Parties of Demand Management opportunities
- maintenance of a panel of non-network service providers who are available to investigate and advise on demand management options
- consultation with prospective Demand Management Service Providers
- collaborative agreements with leading academic institutions
- participation in related industry working groups.

Suitable non-network alternatives to major network augmentations have proven difficult to source in Essential Energy's network, due in large part to the nature of the identified constraints and their associated network support requirements. During 2010–2011, Demand Management assessments were carried out on four Essential Energy new large distribution network asset projects. All were found to be non-viable due to the cost of network support being significantly higher than the avoided cost of the augmentation component of the project.

There were no zone substation capacitor bank installations completed in 2010–2011 due to delays in procurement of major equipment however the backlog is expected to be addressed during 2011–2012. Essential Energy has also continued to invest in upgraded load control functionality and in conductor upgrades which provide a demand benefit through series loss reductions.

Development work also continued on innovative power electronic equipment for energy storage, reactive power and embedded generation applications with proof of concept achieved and field installations planned for 2011–2012.

Table 3.5 Demand Management Projects Implemented During Current Year

	Description of Demand Management Project Implemented	Peak Demand Reduction (kVA)	PV of Costs of Demand Management Project	PV of Total of Capital Expenditure Deferment plus Op Ex Savings
Individual large projects				
1	No individual large projects to report due to delays in delivery of zone substation capacitor bank installation program. Significant expenditure projected for 2011–2012.			
Sub Total				
Consolidated projects				
1	Load System Control Upgrades. Estimated 10% of total $1,776,000 spend). Approx 15,000 relays Port Macquarie, Lismore, Tweed Heads, Goulburn, Taree, Cootamundra, Forster	Estimated 500 kVA through improved control of off peak load switching	$177,000	$1,000,000
2	Negotiated Outcomes	Negotiations with rural customers to reduce large load connections such as underfloor heating methods on rural feeders		
Sub Total		**500**	**$177,000**	**$1,000,000**
Total		500	$177,000	$1,000,000

Table 3.6 Demand Management Investigations in Current Year Found Non Viable

	Description of Potential Demand Management Project Investigated and Reason for Non-viability	PV of Costs of Investigations
1	Mulwala and Corowa 66 kV N-1 reliability improvement Not cost effective – required 20 MVA of pre-contingent network support for an augmentation component of $20,900,000	Internal investigation and reasonableness test. Cost estimated at $5,000 but not separately recorded
2	Moama 66 kV N-1 reliability improvement Not cost effective - required 15 MVA network support for an augmentation component of $20,750,000	Internal investigation and reasonableness test. Cost estimated at $5,000 but not separately recorded
3	West Jemalong, Condobolin and Lake Cargelligo 66 kV N-1 reliability improvement Not cost effective – required 15 MVA network support for an augmentation component of $13,710,000	Internal investigation and reasonableness test. Cost estimated at $5,000 but not separately recorded
4	Gilgandra and Coonamble 66 kV N-1 reliability improvement Not cost effective – required 15 MVA network support for an augmentation component of $20,400,000	Internal investigation and reasonableness test. Cost estimated at $5,000 but not separately recorded
5	Joint TransGrid investigation into supply for the Gunnedah, Narrabri and Moree area	Project Specification Consultation Report published March 2011 and consultation ongoing

4

Asset Management

4.1 Overview

Asset management is a critical component of Essential Energy's overall network management strategy and has an important role in determining the outcomes for both the business and our customers.

The NAMP provides a framework for strategic management of our physical system assets to best support network service delivery. It includes our asset management strategies, policies, processes, resources, and our planned capital investments, asset maintenance and demand management. The NAMP is closely related to annual budgets and forecasts for capital, operating and maintenance expenditure planning.

The NAMP's primary objectives include:

- establishing priorities in line with organisational objectives and statutory obligations, namely safety, reliability and sustainability
- planning and controlling financing and expenditure in accordance with these priorities
- ensuring resources are used as effectively and efficiently as possible so that the government and the community receive the most value for money.

These objectives cover the three major elements of asset management outlined in the NAMP:

- capital investment strategic planning
- asset renewal and replacement strategic planning
- asset maintenance strategic planning.

The NAMP is designed to comply with the NSW Government's policy on Total Asset Management (TAM). It includes a five-year forecast and reviews capital investment, refurbishment and asset maintenance strategies to ensure a focus on long-term, systemwide and whole-of-life management. These strategies ensure delivery of a secure, high quality, reliable and safe electricity network service that meets the needs and expectations of customers, community, shareholders and other stakeholders at the lowest possible price, and complies with related statutory and regulatory requirements.

Essential Energy reviews this plan annually.

4.2 Technical Service Standards

The Electricity Supply Standards adopted by Essential Energy are set out in the document CEOP8026 Electricity Supply Standard, in accordance with the Code of Practice: Electricity Service Standards published by the former Electricity Association of NSW. The document outlines our objectives for technical performance of the network and ensures measures are in place to achieve them. Revised Issue 6 of this document was released in July 2011.

The main areas addressed include:

- voltage fluctuations managed in accordance with Australian Standards AS/NZS 61000.3.3:1998, 61000.3.5:1998 and 61000.3.7:2001
- switching transients (voltage waveform distortion) limited where possible to less than two times normal supply voltage
- frequency variation and Essential Energy's role in notifying AEMO of any sustained fluctuations
- voltage dips managed through best practice network improvement and augmentation

- steady state voltage differences between neutral and earth limited to less than 10 volts at the customer's point of supply
- lightning strikes limited in their impact on supply where possible by adherence to industry best practice system design and maintenance principles
- limitation of 'step and touch' voltage differentials managed in accordance with industry standards, namely ENA Earthing Guide AS/NZS 7000
- limiting of voltage imbalance to a six per cent difference on the LV network using 10 min average values between the highest and lowest phase to neutral or phase to phase steady state voltages (This may be exceeded on occasions in rural areas)
- harmonic content of voltage and current waveforms managed in accordance with Australian Standards AS 61000.3.6:2001
- mains signalling reliability set at a target of 99.5 per cent failsafe to ensure correct switching and metering functions.

A copy of CEOP8026 Electricity Supply Standard can be downloaded from **essentialenergy.com.au**

Adoption of Australian Standard AS 60038 – 2000 Standard Voltages

CEOP8026 also outlines Essential Energy's adoption of the Australian Standard AS 60038 – 2000 Standard Voltages. The standard formally calls for a voltage range of 230V/400V plus 10 per cent, minus 6 per cent, which Essential Energy will satisfy by endeavouring to maintain a minimum variance of minus 2 per cent and an upper bound of plus 10 per cent.

4.3 Quality of Supply

4.3.1 Overview

Essential Energy actively participates in the Long Term National Power Quality Survey (LTNPQS), a national power quality survey conducted by the University of Wollongong and a number of other distributors throughout Australia.

This survey studies parameters such as steady state voltage, voltage total harmonic distortion (THD), voltage sags and voltage unbalance on three phase sites.

[1] There is a 12 month reporting lag due to time constraints on the University of Wollongong receiving information from participating distributors and enabling time to collate and compile the National Reports.

4.3.2 Performance Data

Trend of Essential Energy Low Voltage Utility Median Values

Disturbance	Limit	2004–2005		2005–2006		2006–2007		2007–2008		2008–2009		2009–2010	
		Index	% of limit	Index	% of limit	Index	% of limit	Index	% of limit	Index	% of limit	Index	% of limit
AVD	6.00	4.92	82	4.73	79	4.48	75	4.38	73	4.61	77	4.04	67
Unbalance	2.00	1.78	89	1.51	80	1.68	84	1.67	83	1.83	92	1.38	69
Harmonics	7.30	2.73	37	2.64	36	2.93	40	2.82	39	2.81	38	2.70	37
Sags	25.00	0.80	3	0.51	2	0.33	1	0.02	0	0.16	1	0.04	0

Figure 1 *Essential Energy's LTNPQS for Low Voltage Sites*

Trend of Essential Energy Medium Voltage Utility Median Values

Disturbance	Limit	2004/2005		2005/2006		2006/2007		2007/2008		2008/2009		2009/2010	
		Index	% of limit	Index	% of limit	Index	% of limit	Index	% of limit	Index	% of limit	Index	% of limit
Voltage Spread	–	3.85	–	3.93	–	4.49	–	3.80	–	3.62	–	2.89	–
Unbalance	2.00	1.75	87	1.69	84	1.92	96	1.68	84	1.68	84	1.90	95
Harmonics	6.60	2.86	43	2.20	33		0	2.42	37	2.30	35	2.07	31
Sags	25.00	12.88	52	8.55	34	8.39	34	3.47	14	2.53	10	2.97	12

Figure 2 *Essential Energy's LTNPQS for Medium Voltage Sites*

For LV sites, the steady reduction of Absolute Voltage Deviation (AVD) has continued. Unbalance has decreased significantly from last year. No other significant trends are evident.

For MV sites, voltage spread continues to reduce while unbalance has increased sharply. No other significant trends are evident.

4.4 Distribution Reliability

4.4.1 Overview

Essential Energy conducts its reliability reporting in accordance with the NSW Design, Reliability and Performance (Licence Conditions).

Essential Energy has 293 Urban Feeders, 897 Short Rural Feeders and 239 Long Rural Feeders. Over 55 per cent of our customers are on Short Rural Feeders and the average length of these feeders is approximately 60 kilometres.

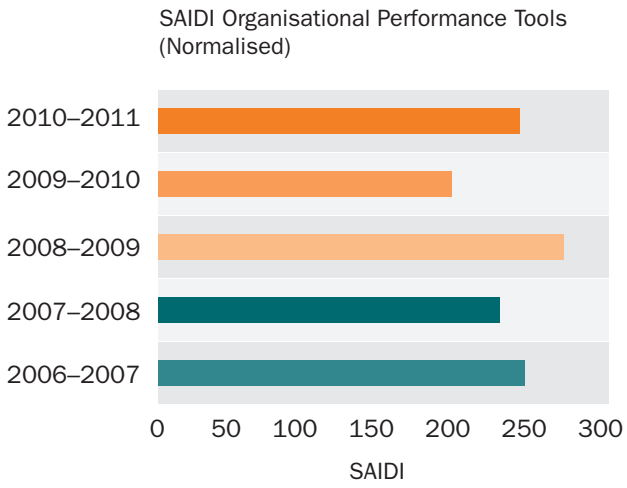
Implementation of General Electric's ENMAC suite of software was completed on 24 July 2010. ENMAC will achieve an automated interface between systems, producing accurate reliability information to a distribution substation level for outage reporting, previously outage data was only recorded to a distribution feeder segment level.

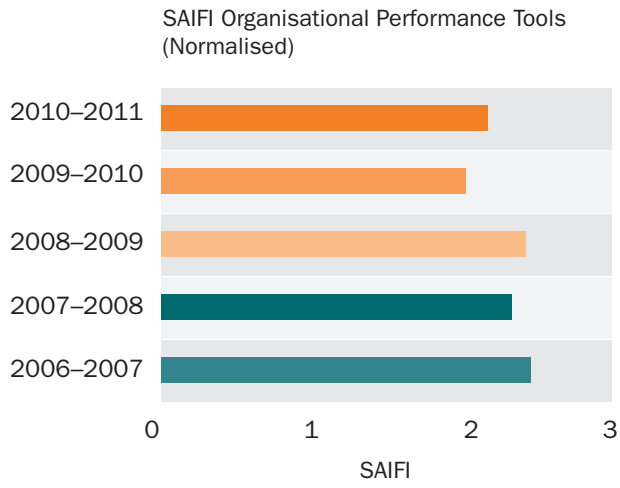
4.4.2 Organisational Performance (Normalised) Trend

Reliability data for SAIDI and SAIFI (Normalised) is reported in Table 4.1 and the graphs show the organisation trends over five years.

Table 4.1 Organisational Performance Trends (Normalised)

Year	2006–2007	2007–2008	2008–2009	2009–2010	2010–2011
SAIDI	242	225	267	196	238
SAIFI	2.39	2.28	2.37	1.99	2.14





Comment on performance

Essential Energy's network performance during the year is better than mandated in the licence conditions, and a testament to the network improvement strategies that Essential Energy is implementing.

4.4.3 Organisational Detailed Performance Current Year

Reliability data sets for SAIDI and SAIFI are reported for the whole organisation and feeder categories in Table 4.2.

Table 4.2 Organisational Detailed Performance Current Year

Sustained Interruption Data Sets		Whole Organisation and Feeder Category				
Category		ORG*	CBD	Urban	Short Rural	Long Rural
Customer Numbers		794,111	NA	207,699	459,241	127,171
SAIDI	**Overall**	434	NA	170	448	780
	Planned	157	NA	88	154	272
	Unplanned	270	NA	79	287	499
	Normalised	238	NA	66	245	493
SAIFI	**Overall**	2.97	NA	1.26	3.15	4.85
	Planned	0.67	NA	0.31	0.66	1.25
	Unplanned	2.17	NA	0.91	2.37	3.38
	Normalised	2.14	NA	0.85	2.38	3.37

* Refers to the average performance of the organisation overall.
Note: Normalised data represents unplanned outages with 'excluded interruptions' subtracted e.g. those defined as being outside the control of the distributor.

4.4.4 Reliability Report against Standards

Table 4.3 CBD Feeder Performance (Normalised) Trend

Year		2006–2007	2007–2008	2008–2009	2009–2010	2010–2011
SAIDI	**Actual**	NA	NA	NA	NA	NA
	Target					
SAIFI	**Actual**	NA	NA	NA	NA	NA
	Target					

Table 4.4 Urban Feeder Performance (Normalised) Trend

Year		2006–2007	2007–2008	2008–2009	2009–2010	2010–2011
SAIDI	**Actual**	114	80	110	69	66
	Target	137	134	131	128	125
SAIFI	**Actual**	1.36	1.21	1.36	1.04	0.85
	Target	1.96	1.92	1.88	1.84	1.80

Table 4.5 Rural Short Feeder Performance (Normalised) Trend

Year		2006–2007	2007–2008	2008–2009	2009–2010	2010–2011
SAIDI	**Actual**	239	233	285	204	245
	Target	332	324	316	308	300
SAIFI	**Actual**	2.47	2.42	2.58	2.19	2.38
	Target	3.24	3.18	3.12	3.06	3.00

Table 4.6 Rural Long-Feeder Performance (Normalised) Trend

Year		2006–2007	2007–2008	2008–2009	2009–2010	2010–2011
SAIDI	**Actual**	497	431	483	384	493
	Target	740	730	720	710	700
SAIFI	**Actual**	3.82	3.50	3.47	2.88	3.37
	Target	4.90	4.80	4.70	4.60	4.50

Comment on performance

It can be seen from Tables 4.3 to 4.6 that Essential Energy has consistently out-performed its target across all feeder categories, due to our strategic reliability improvement programs.

Excluded events

Table 4.7 Excluded Interruptions for Current Year

Date of Event	Description of Event	Number of Customers Interrupted	Maximum Duration of Interruption (minutes)	Effect of Event on SAIDI Figure (minutes)	Basis for Exclusion
05/09/10	Storms/floods Bega area	27,897	5,886	25.78	Major Event Day
22/03/11	Storms/strong winds Moruya area	18,911	10,669	6.48	Major Event Day

Major event day TMED

The value of TMED for 2010–2011 was 5.99 minutes.

4.4.5 Performance Against Individual Feeder Standards

The performance objectives for organisational average performances for each feeder category are not sufficient to identify when customers on a particular feeder experience unsatisfactory reliability performance. For this reason, SAIDI and SAIFI criteria (after 'excluded interruptions' are disregarded) act as a trigger for investigation and exception reporting purposes. The figures contained in the ministerially imposed licence conditions are shown in Table 4.8.

Table 4.8 Individual Feeder Standards for Exception Reporting Specified in the Licence Conditions Applicable to your Organisation

Category	CBD	Urban	Short Rural	Long Rural
SAIDI	NA	400	1,000	1,400
SAIFI	NA	6	8	10

Performance outside this range results in the following actions:

- immediate investigation of the causes for each feeder exceeding the individual feeder standards
- by the end of the quarter following the quarter in which the feeder first exceeded the standard, complete an investigation report identifying the causes and action required to improve the performance
- complete any operational actions identified in the investigation report by the end of the third quarter following the quarter in which the feeder first exceeded the standard
- where the investigation report identifies actions, other than operational actions, required to improve the performance of each feeder to the individual feeder standards, develop a project plan, including implementation timetable, and commence its implementation by the end of the second quarter following the quarter in which the feeder first exceeded the individual feeder standards.

Summarised performance against the above licence conditions is shown in Table 4.9.

Table 4.9 Individual Feeder Performance against the Standard Summary

Type	CBD	Urban	Short Rural	Long Rural
Feeders (total number each type)	NA	293	897	239
Feeders that exceeded the standard during the year (total number)	NA	7	72	35
Feeders not immediately investigated (total number)	NA	0	0	0
Feeders not subject to a completed investigation report by due date (total number)	NA	3	43	16
Feeders not having identified operational actions completed by due date (total number)	NA	0	0	1
Feeders not having a project plan completed by due date (total number)	NA	2	19	4

Comment on performance

Following periods of high network activity, an increased number of feeders require investigation. In all cases, the investigation commenced on time and interim remedial actions taken where appropriate, even though the report may not have been completed in the required timeframe.

The number of feeders exceeding individual feeder standards is reducing and currently is 8 per cent of the total number of feeders. Essential Energy has implemented processes to expedite investigations.

4.5 Transmission Reliability

Essential Energy has no requirement to provide this data.

5

Network Safety

5.1 Overview

Essential Energy is Australia's largest regional utility business. The safety, security, health, and wellbeing of our employees, customers, contractors, visitors, labour hire employees, the public and the environment are our highest priority.

Our aim is to integrate Safety, Security, Health and Environmental (SSHE) responsibilities into all that we do.

To demonstrate our commitment to SSHE, we will:

- strive to be an incident free organisation
- provide a safe, secure, healthy and environmentally conscious working environment through the effective implementation of this policy
- apply a risk management approach to the full scope of our activities, products and services to reduce hazards
- comply with relevant legislation, regulations, standards, codes, licences and commitments
- ensure all employees are trained and have the knowledge and skills they need to undertake their work in a safe, secure, healthy and environmentally responsible manner
- require supervisors, employees, contractors, labour hire employees and visitors to abide by all SSHE policies, procedures and other requirements
- engage in effective consultation and open communication about SSHE issues with our employees, employee representatives, contractors and labour hire employees
- conduct incident investigations fairly with a focus on implementing preventative actions
- ensure appropriate resources are applied to fulfil the aims of this policy
- establish measurable objectives and targets based on our significant SSHE hazards to continually review and improve our safety, security, health and environmental performance
- minimise the impact of pollution generated by our activities on the environment by reducing emissions, discharges and wastes by promoting energy conservation and recycling of wastes
- promote a 'safety first' culture where everyone watches out for their workmates, families and local communities.

5.2 Serious Electricity Network Accidents (Public)

Essential Energy's Public Electrical Safety Awareness Plan provides strategies to raise public awareness of the numerous hazards that may result from contact with electricity network assets, and provide simple yet effective ways to minimise the risk.

Our strategy of targeting 'at risk' groups – providing education and assistance to prevent and solve electrical safety issues – is the key to reducing the number of public safety incidents.

Table 5.1 Serious Electricity Network Accidents (Public) Trend

Year	2006–2007	2007–2008	2008–2009	2009–2010	2010–2011
Non-fatal	2	2	1	2	4
Fatal	2	0	0	2	1

Fatal incidents

A self-powered glider suffered mechanical failure shortly after take-off and lost control of the aircraft. The machine contacted HV conductors as it crashed to the ground.

Non-fatal incidents

- A truck driver was unloading poly pipes on a rural property using a HIAB-type crane mounted on the back of the truck. The operator was standing on the trailer reaching up to connect the load to the hook when he heard a crack like that of an electric fence and felt an electric shock. He continued to unload; packed up the truck and drove to the property entrance where he fainted and ran the truck off the road. Information provided by the landowner indicated the vehicle-mounted crane may have encroached safe working distances, creating a flashover.
- An elderly gentleman was riding his stock horse in a paddock when he felt the horse stumble and it fell. While freeing himself from under the deceased horse, he received an electric shock. The horse was electrocuted when it contacted an energised LV conductor lying on the ground. A cross-arm failure due to rot caused the conductor to fall.
- A gyrocopter pilot contacted an SWER line resulting in the machine crashing. The pilot was seriously injured and transferred to hospital in Adelaide.
- A homeowner was constructing an awning when he cut through the service cable with hand tools. He thought the cable belonged to Foxtel. With the cut, a flashover occurred resulting in burns to his arm. He was advised to seek medical attention.

Preventative actions for all incidents are a continuation of outworking activities in accordance with Essential Energy's Public Electricity Safety Awareness Plan. Where applicable, public electrical hazard awareness information was provided and offers were made to conduct Electrical Hazard Awareness presentations.

5.3 Actionable Electricity Network Safety Incidents (Public)

Increased agricultural activities and a bumper harvest seasons after a decade of drought along with the severe weather patterns (flooding) over a wide area appears to be the major contributing factor to an increase of public safety incidents during the 2010/2011 financial year.

Many agricultural areas during drought years may have lost workers along with their awareness knowledge to perform their normal farming activities and due to this employment short fall a reliance on transient employees, family and friends has potentially occurred during peak periods.

Construction of hastily erected levee banks to protect areas and the associated increase activity during this high pressure period is also thought to have contributed to the increase along with alternative methods of farming practice being utilisation in areas usually land based, being aerial spraying (21 wire strikes).

A revised interpretation by Essential Energy regarding the definition of an 'Actionable Safety Incident' to raise awareness with DTIRIS and "Work Cover" has also been adopted. Special emphasis regarding reporting all incidents involving public injury involving HV or LV, HV brought to the ground, machinery entangled in HV, aircraft strikes, cotton industry strikes and others as determined by Executive Management where an incident, which is not a serious electricity network accident, involving the electricity network, but there was a significant risk that a person (employee or public) could have been seriously hurt by that incident.

Much has been done to raise awareness throughout the community regarding these hazards including targeted print media and radio campaigns, face to face door knocks and Electrical hazard awareness presentations to industry and farmers in the lead up to harvest season. Attendance at agriculture field days has also lead to an increased awareness to report incidents along with an improved reporting functionality with TotalSAFE and closer review of all incidents by Safety Health & Environment (SHE) team members has contributed to the increase in ASI's.

The 'at risk' groups include Emergency Services, earth movers, construction workers, cotton growers, pilots, transport groups, and relevant Local and State Government workers. Essential Energy consults widely and tailors pro-active training sessions free of charge.

Table 5.2 Actionable Safety Incidents (Public) Trend

Category	2006–2007	2007–2008	2008–2009	2009–2010	2010–2011
Overhead mains in position	11	9	9	7	101
Overhead mains fallen	4	4			
Overhead service in position					1
Overhead service fallen	2				
Underground mains	1			2	7
Underground service					1
Street light fitting or support			1		1
Cable boxes, pillars and service cabinets					
Substation (excluding pole-type) – fire and/or explosion					
Substation (excluding pole-type) – Other				1	
Substation (pole-type) – fire and/or explosion					
Substation (pole-type) – Other					
Poles, columns or towers	1			1	1
Air break switches					
Pole mounted equipment (reclosers, drop out fuses, etc)					
Service connection or customer switchboard	1				
Total	26	13	10	11	112

5.4 Serious Electricity Network Accidents (Network Worker and Accredited Service Provider)

Table 5.3 Serious Accidents (Network Worker and Accredited Service Provider) Trend

Employment Category	2006–2007	2007–2008	2008–2009	2009/2010	2010/2011
Distributor employees	1	4	1		6
Distributor contractors					
Accredited service providers					

- employee received an electric shock from a pole due to faulty insulators creating leakage. The insulators were replaced and there was no further leakage. The employee underwent ECG as a precaution
- employee received a head injury when broken porcelain fell from aloft
- employee was hospitalised after an HV link assembly fell from aloft, striking employee on his back
- employee received crush injuries to fingers and hand when caught in a crane borer winch rope
- employee received electric shock when he contacted unseen energised fallen conductors during storm restoration
- employee received flash burns to the face from phase-to-phase fault when connecting LV ABC.

5.5 Actionable Electricity Network Safety Incidents (Network Workers)

The continued decline in incidents from 2007–2008 can be attributed to the success of the increased focus on safety process auditing, mentoring and coaching.

Table 5.4 Actionable Safety Incidents (Network Workers) Trend

Year	2006–2007	2007–2008	2008–2009	2009–2010	2010–2011
Number	24	9	5	0	0

5.6 Major Incident Reports

Table 5.5 Summary of Major Incident Reports

Date	Incident Description	Locality
20/07/2010	Tripping of Sawtell zone substation	Sawtell
9/08/2010	Tripping of Terranora zone substation	Terranora
21/08/2010	Tripping of 8F1 into Orange South zone substation	Orange
13/10/2010	Loss Of Banora Point zone substation	Banora
23/11/2010	Loss of supply to Temora 132/66 kV	Temora
27/11/2010	Loss of supply to Leeton zone substation	Leeton
27/11/2010	Loss of supply to Ashmont zone substation	Wagga Wagga
2/12/2010	Loss of supply to Sutton, Bugendore zone substations	Queanbeyan
8/12/2010	Loss of supply to zone substations in Wagga area	Wagga Wagga
25/12/2010	Plane contact HV conductor	Corowa
3/02/2011	Loss of supply to Dubbo West zone substation	Dubbo
26/01/2011	Loss of supply to zone substation in Quirindi area	Quirindi
2/05/2011	Loss of supply to zone substations in Stroud area	Stroud
02/09/2010	Truck driver unloading pipes allegedly received an electric shock. When driving away, he fainted and ran his truck off the road	Emmaville
24/12/2010	A self-powered glider suffered mechanical failure shortly after take-off and lost control of the aircraft. The machine contacted HV conductors as it crashed to the ground	Corowa
8/02/2011	An elderly gentleman was riding his stock horse in a paddock when he felt the horse stumble and it fell. While freeing himself from under the deceased horse, he received an electric shock. The horse was electrocuted when it contacted an energised LV lying on the ground. A crossarm failure due to rot caused the conductor to fall	Murwillumbah
7/03/2011	A gyrocopter pilot contacted SWER line resulting in the machine crashing. The pilot was seriously injured and transferred to hospital in Adelaide	Tiboobura
3/04/2011	A home owner was constructing an awning when he cut through the service cable with hand tools. He thought the cable belonged to Foxtel. With the cut, a flashover occurred resulting in burns to his arm. He was advised to seek medical attention	Darlington Point
25/01/2011	Employee was hospitalised after HV link assembly fell from aloft, striking the employee on his back	Inverell
9/03/2011	Employee received crush injuries to fingers and hand when caught in a crane borer winch rope	Berrigan
22/06/2011	Employee received flash burns to face from phase to phase fault when connecting LV ABC	Walgett

6

Customer Installations

Monitoring of installations is carried out in accordance with regulations and industry codes of practice. In addition to the Electricity Supply (Safety and Network Management) Regulation 2008, installations must be consistent with the Electrical Safety (Electrical Installations) Regulation 1998, the Code of Practice for Installation Safety Management and the Code of Practice for Contestable Works Accreditation.

Essential Energy's CEOP8004 Network Management Plan Chapter 2: Customer Installation Safety Plan outlines the approach taken to managing all aspects of customer installation work. The plan defines our approach with respect to the roles of both contractors and Essential Energy.

Installation and inspection data is managed within Essential Energy's Web Form Manager system which provides a history of work notified through the lodgement of Certificates of Electrical Work (CCEW's) and Notifications of Service Work (NOSW) forms which provide the platform to manage the auditing of Electrical Contractor's to ensure adherence to CEOP8004.

The figures shown in Table 6.1 below indicated a substantial increase in the number of forms lodged and reflects the industries involvement in the solar bonus scheme over the reporting period.

6.1 Reports against Customer Installation Safety Plans

Table 6.1 Installation Inspections Trend

Year	2006–2007	2007–2008	2008–2009	2009–2010	2010–2011
Number of notifications (CCEW)	20,651	19,721	18,771	26,614	54,152
Number of inspections	9,404	8,555	7,297	10,920	25,706
Installation inspection rate (%)	45.5	43.4	38.9	41	47
Major safety defect rate (%)	3.3	2.4	2.8	2.5	2.1
Safety breach notices Issued (%)	3.4	2.5	2.9	2.6	0.44
Number of warnings ilssued	323	212	214	280	1,148
Reports to Fair Trading (No.)	5	5	4	5	3
Number of audits by distributor	68	37	28	91	212

6.2 Customer Installation Shock Reports

Table 6.2 Customer Installation Shock Reports Trend

Year	2006–2007	2007–2008	2008–2009	2009–2010	2010–2011
Shocks on customer's premises (number reported)	608	834	719	678	654

Table 6.3 Customer Installation Safety- Categories of Shocks Analysed

Category	Number		% of Total
	Fatal	Non Fatal	
Cause Category Installation Related			
Contact with Consumer's Mains – Faulty Mains		4	0.6%
Contact with Consumer's Mains – Human error		14	2.1%
Contact with Live Parts at Switchboard – Faulty Switchboard		4	0.6%
Contact with Live Parts at Switchboard – Human Error		8	1.2%
Faulty Mains Box		47	7.2%
Induced Voltage		22	3.4%
Poor Earthing		12	1.8%
Unsafe Installation Work by Licensed Contractor		7	1.1%
Failure of Part of Installation (not water related)		15	2.3%
Defective or Unsuitable Appliance		39	6.0%
Working on or Interference with Installation		9	1.4%
Working on or Interference with Appliance	1	3	0.5%
Water Damage or Ingress		15	2.3%
No Cause Found (Including Static Electricity)		61	9.3%
Other (Installation Related)		44	6.7%
Sub Total	**1**	**304**	**46%**
Cause Category Network Related			
Contact with Network Mains - Faulty mains		2	0.3%
Contact with Network Mains - Human error		3	0.5%
Contact with OH Service Mains - Faulty mains		2	0.3%
Contact with OH Service Mains - Human error		3	0.5%
Faulty OH Mains Joint		39	6.0%
Faulty OH Service Joint		112	17.1%
Faulty Underground Mains Joint		17	2.6%
Faulty Underground Service Joint		14	2.1%
Faulty OH Open Service		2	0.3%
Faulty OH Twisted Service		11	1.7%
Faulty UG Service		1	0.2%
Faulty UG Mains		0	0.0%
Long LV Run		37	5.7%
LV Leakage (salt/dust)		4	0.6%
HV Leakage		2	0.3%
Nuisance Tingles <10 volts		63	9.6%

Incorrect Polarity		3	0.5%
Other (Network Related)		28	4.3%
Sub Total	**0**	**343**	**52.4%**
Other Cause Categories			
Lightning/Storm		4	0.6%
NA		2	0.3%
Undefined (under investigation)		1	0.2%
Sub Total	**0**	**7**	**1.1%**
Total	1	654	
Total per 1,000 customers			0.8147

7

Contestable Works Scheme

Essential Energy previously used the Contractor Performance Register (CPR) to monitor all Level 2 works. Since April 2011, CPR was decommissioned and the Level 2 data capture is now entered into the recently developed Web Form Manager (WFM) system. The Level 2 figures for this report period have been a manual compilation from both systems.

Level 1 and Level 3 work is collected regionally by the Quality Control Coordinators, working in conjunction with the regional Planning and Customer Connection Managers.

2010/2011 has seen the following trends:

- **Level 1:** Internal project notifications are down and inspection rates falling in line with this decline. This is partly explained by the increase in external Level 1 works notices and inspections
- **Level 2:** The 2010–2011 trends have again highlighted the continued growth and involvement by all stakeholders in the solar bonus scheme. The rigour of Essential Energy's commitment to the inspection of these installations has created the need for additional resources across all the respective business units. The additional resources while retaining the previous year's inspection average are currently addressing the growing number of inspections pending
- **Level 3:** A significant increase in certified external designs is reflective of the increase in Level 1 external works. As more external Accredited Service Providers continue to gain accreditation to operate within the service area, this increase will continue to meet demand of contestable market.

Table 7.1 Contestable Works Trend

	2006–2007		2007–2008		2008–2009		2009–2010		2010–2011	
	Int	Ext	Int	Ext	Int	Ext	Int	Ext	Int	Ext
Network Work (Level 1)										
Project notifications	1,861	799	1,520	1,103	778	1,269	538	1,434	153	1,830
Initial inspections of completed projects	1,048	618	540	623	786	947	595	907	391	1,026
Of projects inspected, number initially nonconforming	175	85	109	146	220	200	46	159	87	228
Customer Connection Work (Level 2)										
Notifications (NOSW)	6,299	13,203	5,573	13,238	5,518	17,135	3,338	19,910	2,653	49,163
Inspections by network operator	3,540	9,268	3,143	11,807	3,485	12,919	2,526	12,433	1,891	31,554
Major defects	3	130	–	102	3	107	2	62	2	379
Network Design Work (Level 3)										
Designs certified	1,861	631	1,225	1,114	778	947	538	1,234	158	1,825

8

Bushfire Risk Management

Table 8.1 Bushfire risk management

	2006–2007	2007–2008	2008–2009	2009–2010	2010–2011
Assets in bush fire prone areas checked by pre-summer inspection (%)	70	70	100	100	100
Private lines in bush fire prone areas checked by pre-summer inspection (%)	70	70	100	100	100
Fire ignitions by network assets (number)	131	71	98	169	120
Complaints from the public regarding preparation for the bushfire season (number)	6	7	7	22	37

Notes:

1. Fire ignition numbers exclude bushfire affected network poles where ignition is not network related. Reported numbers include damage to network by third parties resulting in fire ignition (19 for 2010–11) and private lines.
2. Complaints increased significantly in 2010 due to modification to the reporting system, larger network area flown, including low voltage supply to rural homes, and the introduction of a new contracted service provider flying at a lower altitude.

Inspections

Essential Energy predominant inspections pertaining to bushfire risk mitigation include:

- annual pre-summer aerial inspection of overhead lines to identify assets or vegetation with potential bushfire risk
- annual inspection of the entire rural network by aerial bushfire patrols was satisfactorily completed prior to the declared fire season. This inspection seeks to identify any urgent risk or risk defect work requirements within high bushfire-prone areas with potential for fire start
- four yearly cycle of ground-line inspection and assessment of overhead poles and structures
- the Essential Energy ground-line asset inspection program was behind schedule at 30 June 2011, due to wet weather and implementation of a revised program schedule. 87 per cent of the targeted pole population was inspected. Additional resources are being employed to address this situation with priority given to areas of high risk
- two yearly cycle of ground-line inspection of vegetation in rural areas
- vegetation inspections were also behind schedule for 2010-11 and measures are also being put in place to address this situation. Essential Energy is consulting with staff and unions for the use of contract vegetation scoping service providers for 2011–12
- four yearly earth integrity testing program
- this inspection program is generally aligned with the pole and line inspection program.

Private lines

- Essential Energy inspects and monitors the maintenance requirements for rural private lines to manage potential bushfire risk. Rural private low-voltage lines are generally inspected under the same programs that Essential Energy applies to its own network, for example, four-year ground-line inspection of poles and lines, two-year vegetation inspections and annual pre-summer inspection of assets and vegetation clearances.

The results of the 2010–11 asset inspection program are shown below.

Table 8.2 Asset Inspection Program

Poles Inspected	Poles for replacement or reinforcement
282,426	6,535

The average pole replacement/reinforcement rate was 2.31 per cent of poles inspected, which is consistent with expectations.

Annual bushfire patrol

The results of the annual pre-summer bushfire patrols for the 2010–11 season are shown below.

Table 8.3 Annual Patrol Defects Identified

Annual Patrol Defects Identified 2010–11

Defect Category	Urgent Risk Defects – Rural Areas
Number of defects identified in annual patrols 01/01/2011 – 30/06/2011	1,758
Defects rectified by 10/08/11	1,730

Essential Energy proposes to report progress of the annual bushfire patrol based on the calendar year as patrols occur at the start of the year and take approximately six months to complete. Priority defects identified by these patrols are programmed for completion by commencement of the fire danger declaration period, usually in October/November each year.

This year's patrol found 1,758 urgent defects requiring attention before the fire season. As at 10 August 2011, a small number (28) of these remained open. It wass expected these would be completed prior to 1 October 2011.

Audit of activities

Essential Energy carries out a number of audits on key activities associated with bushfire mitigation. These include activities relating to;

- ground-line pole and line inspections
- vegetation inspections
- annual bushfire patrols in rural areas.

The purpose of the audits is to ensure the activities are carried out in accordance with Essential Energy's policies and procedures.

Essential Energy is developing specific reports in regard to the outcomes of these audits to highlight performance and outcomes in future Network Performance Reports.

Each asset inspector has been audited a minimum of once per year and any competency deficiencies addressed. Many of these are minor non conformances.

Community awareness

Essential Energy has developed materials relating to bushfire risk and safety that are provided to the public via its website and other marketing channels each year. The Vegetation Management Plan and Bushfire Plan are specifically available for download to the public.

Bushfire related electrical safety topics include:

- bushfire and storm safety tips
- dangers of trees near power lines
- electrical safety for emergency services personnel
- advice on safety when burning off near electrical network assets
- safe operation of farm equipment such as grain augers, harvesters and irrigation systems
- advice on electrical safety for heavy plant operators.

Essential Energy remains an active member of the local Bushfire Management Committees with employee representatives on some 45 committees across NSW.

Bushfire mitigation initiatives

In 2010–11, Essential Energy continued the review and assessment of the Victorian Bushfire Royal Commission recommendations relating to electrical causes of fire. Essential Energy continues to monitor industry research being conducted through the Powerline Bushfire Safety Taskforce.

Essential Energy has implemented, or is currently implementing, several new bushfire mitigation initiatives such as;

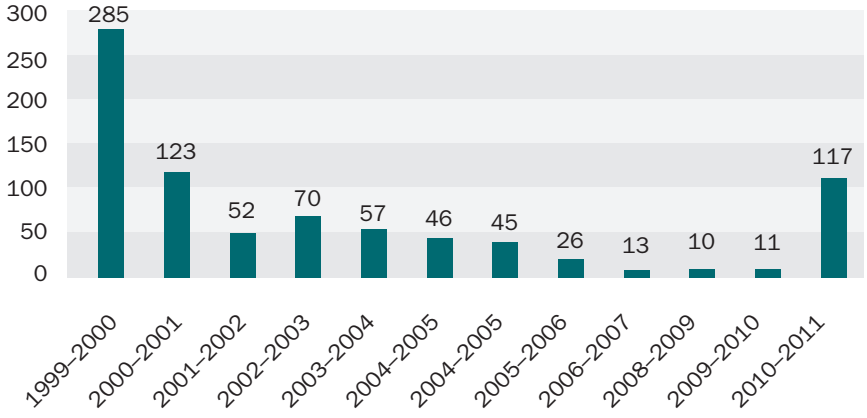
- review and implementation of activities associated with the eight Victorian Bushfire Royal Commission recommendations relating to electrical caused fires
- participation in industry review of ISSC 33 – A guideline for network configuration during high bushfire risk days
- RFS consultation
  - to understand the new fire danger rating codes including setting new imitations for field activities on high risk days
  - to access information relating to new gridded weather forecasts and make this available to the network operators
  - to align Essential Energy risk management methodology applied when operating the network on high risk days.
- review of the Vegetation Management Plan and Bushfire Risk Management Plan
- trials and research into new technologies including
  - a high-voltage fuse saver product that prevents fuse operation associated with ignition risk
  - corridor reclamation projects using specialised vegetation cutting machinery (girraff, mega mulchers)
  - Lidar, Corona and thermal-imaging cameras attached to vehicles to scan the network and detect potential faults
- refinement to the procedures and processes for network fire reporting, investigations, and analysis of causes
- assessment of different methods for modelling fire risk associated with electrical networks.

9

Public Electrical Safety Awareness

The number of reportable Public Safety incidents increased dramatically from 11 in 2009–10 to 117 in 2010–2011. Increased agricultural activity and bumper harvest seasons after a decade of drought appears to be the major contributing factor to this increase. Other contributing factors include an alteration to the reporting process to align more closely to the SENI descriptors along with the decision to notify DTIRIS and other regulators about the worrying increase of these incidents.

Reportable Public Safety Incidents Historical



Much has been done to raise awareness throughout the community regarding these hazards, including targeted print media and radio campaigns, face-to-face door knocks and Electrical Hazard Awareness presentations to industry and farmers in the lead up to harvest season; and attendance at agricultural field days.

The major ‘at risk’ groups for continued focus includes the agricultural, transportation, aviation and construction industries. This will be done in consultation with WorkCover NSW to ensure consistency and a united front.

Public safety initiatives:

A new series of Public Safety Electrical Hazard Awareness DVDs are under development in a joint venture between Essential Energy, Ergon Energy, Endeavour Energy and Ausgrid. This is a great initiative for the industry as a whole.

Essential Energy planned to offer new educational resources to all primary schools in our network area during September. The goal is to teach children aged seven to 10 about electricity and safety. The resources are aligned with the NSW Science and Technology curriculum. This is the first time Essential Energy will be rolling out a large-scale educational program to primary schools in its network area.

The 2011 program will offer an Electricity and Safety unit book with lesson plans for teachers with classes in Years 5 and 6. These have been translated into four interactive SMART Board lessons. These SMART Board resources will be uploaded to Essential Energy’s website for teachers to download and provide to students.

10

Power Line Crossings of Navigable Waterways

Existing crossing numbers

In consultation with NSW Maritime, a number of waterways crossings were identified for risk assessment.

The overhead sites are part of an ongoing inspection and risk assessment program. The table below provides the current number of sites and works carried out in the 2010–11 reporting period.

Table 10.1 Power Line Crossings of Navigable Waterways Summary

	Existing (Number)	New (Number)	Incidents (Number)*	Crossings Reconstructed (Number)#	Crossings Identified as Requiring Conversion to Submarine Crossings (Number)
Overhead crossings	1,299	0	0	4	1
Submarine crossings	59	1	0	–	–

Note: The existing numbers of overhead and submarine crossings shown in Table 10.1 are based on figures provided by the Network Asset Group using the NSW Maritime GIS overlay and information form the network planning database.

One new submarine crossing was installed in the last financial year at Yamba traversing the entrance to the Clarence River. Details of the four reconstructed sites are;

- 1 x Reconstructed to Overhead (relocation from existing site)
  - Durras Lake River Crossing relocation. LIC 100
- 2 x Reconstructed existing overhead to underground
  - Fotherby Park and river crossings
  - Bud Island Oyster Shed River Crossing
- 1 x Reconstruct OH to Bridge attachment
  - Brushgrove – reconstructed crossing from overhead to conduits on bridge

These works resulted in improved safety due to the removal of three existing overhead crossings.

Essential Energy Navigable Waterways Risk Assessment Program

Essential Energy has embarked on a program to inspect and assess all existing overhead sites. This will include an inspection of vegetation, the confirmation of existing data, inspection of supporting structures and hardware, conductor condition, height verification and signage requirements. Delays to the completion of assessment program were experienced in 2010–11 due to high rainfall, high river flows and flooding. It is now anticipated the assessments process will be completed by 30 June 2012.

Crossings incidents

Essential Energy had no reportable incidents for the 2010–11 period.

11

Managing Director Declaration

Essential Energy

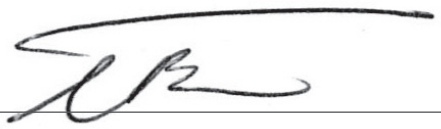
ELECTRICITY NETWORK PERFORMANCE REPORT 2010/11

Declaration by Managing Director

In submitting this Electricity Network Performance Report (the Report), I declare that the Report:

1. Complies with reporting requirements prescribed under the Electricity Supply (Safety and Network Management) Regulation 2008, and the "Distribution Network Service Provider Annual Report Outline" (the Outline), as provided by DTIRIS.
2. Has been checked in accordance with recognised quality procedures; and in my opinion, there are reasonable grounds to believe the data, and notes in respect of data contained in this Report, give a true and fair view of the organisation's performance in respect of the matters contained in the Outline.

MANAGING DIRECTOR: Terri Benson

SIGNATURE: 

DATE: 29/11/11

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