INQUIRY INTO ETSA UTILITIES' NETWORK PERFORMANCE AND CUSTOMER RESPONSE JANUARY 2006

- FINAL REPORT -

September 2006

The Essential Services Commission of South Australia
Level 8, 50 Pirie Street Adelaide SA 5000
GPO Box 2605 Adelaide SA 5001
Telephone 08 8463 4444 Facsimile 08 8463 4449
E-mail escosa@escosa.sa.gov.au Website www.escosa.sa.gov.au

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EXECUTIVE SUMMARY

Between 19 and 22 January 2006, South Australia experienced a heatwave, with the maximum temperature in Adelaide exceeding 40º C on each of those days. ETSA Utilities' electricity distribution network was affected by the heatwave, with significant impacts on customers. As a result, the Minister for Energy referred an Inquiry to the Commission under Part 7 of the Essential Services Commission Act 2002. The Inquiry asked the Commission to investigate the reliability and customer service performance of ETSA Utilities during the heatwave. This Inquiry Report sets out the Commission's findings and recommendations in response to the Terms of Reference for the Inquiry.

As required by the Terms of Reference, the Commission has undertaken investigations and made conclusions and recommendations in relation to certain matters considered critical to ETSA Utilities' heatwave performance. Those conclusions and recommendations, summarised below, relate to the performance of ETSA Utilities before and during the heatwave, and appropriate measures that should be put in place to ensure that an improved standard of service to customers is achieved for future extreme weather events.

The Commission will require ETSA Utilities (pursuant to clause 15(1)(b)) of its electricity distribution licence) to provide the Commission with a report by 30 November 2006, addressing separately each of the Commission's conclusions and recommendations.

The Commission will also develop and implement an audit program (in addition to audit work already being undertaken on ETSA Utilities' reporting systems – including the Guaranteed Service Level Payment system) to obtain assurance that ETSA Utilities' systems and processes for dealing with extreme weather events are improved.

Finally, the Commission will embark on a consultative process under the Essential Services Commission Act 2002, with a view to amending the Electricity Distribution Code in a number of important areas where the need for change has been identified through this Inquiry process.

The work of the Commission during the Inquiry has been informed by material received from ETSA Utilities, the Commission's technical consultant (PB Associates), other expert sources (such as the Electricity Supply Industry Planning Council, the Technical Regulator and the Bureau of Meteorology) and members of the South Australian public.

The impacts of the heatwave on the network and customers

Generally, heat-related distribution network problems arise from prolonged (rather than short-term) periods of high temperatures and increasing electricity demand. In South Australia, this is largely due to the use of air-conditioning, leading to overloading of network equipment such as transformers. On 20 January, the ETSA Utilities' network experienced a record peak demand of 2,633 MW.

There were about 96,600 interruptions on ETSA Utilities' network (which has a customer base of around 760,000) over the period 19 to 22 January, of which about 87% were associated

with interruptions on the high voltage network. High voltage interruptions were addressed relatively quickly (an average supply restoration time of 90 minutes). However, low voltage network interruptions, which occurred mostly in the Metropolitan area, were of much longer duration (an average restoration time of 7 hours, with about 560 customers being without supply for 24 hours or more). Response times of such duration are, in the Commission's view, unsatisfactory.

The Commission has found that the problems of most concern during the heatwave were due to the low voltage interruptions.

As required by the regulatory regime imposed by the Commission, ETSA Utilities must make Guaranteed Service Level payments to customers affected by interruptions of duration greater than 12 hours. To date, payments arising from the heatwave total about $535,360 to over 4,000 South Australians. In addition, ETSA Utilities expects to make compensation payments of some $600,000 to customers who suffered a loss due to extended power outages.

These customer payments, which total over $1 million to date, represent a significant financial penalty to ETSA Utilities in relation to its performance during the heatwave – exceeding the amount of any penalty that could be sought by the Commission from a Court were it to seek to prosecute ETSA Utilities in relation to that performance.

Customers affected by outages during the heatwave also experienced difficulties with the timeliness and quality of information from ETSA Utilities concerning expected restoration times. The call rate to the faults and emergencies line of ETSA Utilities' call centre was above 15,000 on each of 21 and 22 January, with average wait times to talk to an operator of about 12 minutes.

Such wait times are unsatisfactory. Further, while the calls of many customers were dealt with by the automated Interactive Voice Recognition system, the information provided was often of poor quality, leading to increased frustration for customers.

ETSA Utilities' planning and preparations

ETSA Utilities has in place a wide range of general planning and preparatory measures that aim to ensure that the network can withstand heatwave conditions and that supply interruptions during such events can be dealt with effectively. These include planning approaches to appropriately "size" the high voltage and low voltage networks for peak summer demands, and documented emergency response procedures. The Commission observes that ETSA Utilities' planning processes have been made more difficult as a result of the proliferation of air conditioners in South Australia.

Specific summer preparatory measures utilised by ETSA Utilities include a program of low voltage transformer upgrades and load balancing in areas of potential concern, and ensuring that adequate resources (e.g. low voltage transformer and fuse spares) have been stockpiled.

Having reviewed ETSA Utilities' preparations for the heatwave, the Commission has found that those preparations were generally appropriate. Specific preparation by ETSA Utilities for

the heatwave was undertaken in accordance with its documented emergency response procedures.

The Commission has also found that ETSA Utilities' low voltage transformer program was (and remains) generally appropriate, although it should ensure that upgrades and replacements are completed prior to the start of peak demand periods.

There are two areas, however, in which the preparations were not appropriate. These two areas were, in the Commission's view, fundamental factors leading to the particular problems experienced by ETSA Utilities and customers as a result of the heatwave.

The first is the reported lack of staff availability during the heatwave; the second is ETSA Utilities' lack of appropriate integration of weather forecasting into its preparations.

There is a close link between the two as, if ETSA Utilities had better processes for utilising weather forecasts in its preparations, then it would have had more opportunities to ensure that appropriate staffing arrangements were in place.

The Commission has had regard to ETSA Utilities' submission that its preparations would have been different in nature and extent if the weather forecasts provided by the Bureau of Meteorology had proved more accurate. The Commission does not accept that submission and has reached the conclusion that ETSA Utilities should adopt a more sophisticated, proactive approach to the interpretation of, and organisational response to, weather forecasts in preparation for extreme weather events.

Commission's Recommendations: Planning and Preparations

In relation to ETSA Utilities' overall network planning and preparation, the Commission recommends that ETSA Utilities should have regard to at least the following matters in on-going reviews of processes:

- ***monitoring "good practice" developments in network planning, in particular to ensure that its planning basis adequately takes account of very hot weather conditions;***
- ***ensuring that the low voltage network load information that it obtains from receiving copy Certificates of Compliance, particularly in relation to the installation or upgrades of air-conditioning units, is appropriately used in network planning;***
- ***ensuring that the After Diversity Maximum Demand value (the maximum demand for an area after considering the diversification of peak loads which occur at different times) used in the planning of new subdivisions is adequate for the expected current demand and reasonable future growth;***
- ***allocating necessary resources to ensure that its pre-summer preparatory work, including necessary low voltage transformer upgrades, is completed prior to 31 December each year, ahead of likely times of peak demand; and***

- ***completing and fully implementing the Outage Management System and network connectivity model by the end of calendar year 2006.***

In relation to ETSA Utilities' use of weather forecast data, the Commission recommends that ETSA Utilities consider at least the following matters:

- ***the development of an internal definition of extreme weather events for which ETSA Utilities should be alert and responsive;***
- ***the incorporation of appropriate error margins into weather forecasts used for extreme weather event planning purposes;***
- ***the feasibility of adopting commercial weather forecasting arrangements to provide data that is tailored to its needs to assist in planning for extreme weather events; and***
- ***the need for active engagement with the Bureau of Meteorology's Duty Forecaster on a regular basis during extreme weather events.***

ETSA Utilities' organisational response during the heatwave

ETSA Utilities' organisational response problems during the heatwave suggest inadequacies in the documented emergency response procedures of ETSA Utilities.

This Inquiry has revealed problems with the manner in which ETSA Utilities managed outstanding low voltage fault restoration jobs during the heatwave. This may have been due partly to inadequate information management relating to such faults and the fact that staff at regional depots, rather than at the centralised Network Operations Centre, were responsible for management of low voltage jobs. As a consequence of this decentralised approach, the extent of problems on the low voltage network was not recognised in time to rectify those problems in an efficient manner.

During the heatwave, ETSA Utilities did not have sufficient crews available in the Metropolitan area to satisfactorily address the outstanding low voltage jobs, and experienced difficulty in calling line and substation staff back to work outside normal business hours.

While the Commission has made a number of recommendations in this area, it acknowledges that ETSA Utilities has advised that it will adopt various initiatives to address the problems found during the heatwave. These include:

- providing wider dissemination of "Emergency Response Level" Procedures to all relevant operational personnel and issuing ETSA Utilities-wide alerts to forewarn relevant personnel of forecast emergency conditions;
- developing new arrangements to maximise the number of personnel likely to make themselves available out of hours for extreme weather events;
- centralising procedures for sorting, managing and dispatching customer outage notifications in the Network Operations Centre; and

- implementing a Maximum Restoration Time Policy to include an outage time component which prioritises customers who face prolonged outages, including single customer outages and outages affecting small groups of customers to ensure that all customers are reconnected within an acceptable time.

Commission's Recommendations: Operational Response

The information available to the Commission suggests that there are opportunities for improvement in ETSA Utilities' operational response processes. The Commission recommends that ETSA Utilities give consideration to the following measures for extreme and/or emergency events:

- ***revising its internal processes and procedures for the management and tracking of low voltage network faults by retaining central control for this function;***
- ***defining a formal emergency risk management role, with the view to appointing a risk manager to the emergency response team;***
- ***exploring the need for non-operational staff (e.g., office-based staff) to be part of the response team during emergency conditions, to ensure that ongoing business culture development includes an emphasis on the "need to respond" during such conditions;***
- ***clarifying the internal responsibility for high-level decisions regarding the priorities for deployment of field resources; and***
- ***considering the use of qualified contractors to supplement the internal resources of ETSA Utilities in tackling widespread low voltage outages.***

ETSA Utilities' management of information during the heatwave

Efficient and timely management of network and customer information by ETSA Utilities during extreme operating conditions will assist it to respond quickly to outages, and to ensure that customers are given reliable information about the likely length of outages. The customer call centre is very important in this respect. The heatwave revealed deficiencies in the information communications systems of ETSA Utilities, with both the timeliness and quality of responses to customers affected by these deficiencies.

The Commission has concluded that the devolution of low voltage outage management to the depots contributed to the information flow difficulties during the heatwave and, as the number of low voltage outages escalated, the updating of the Interactive Voice Recognition system to reflect the status of restoration activities in the field became less timely.

The Commission notes that improvements to the call centre were implemented after the major storms in August 2005. In particular, ETSA Utilities advised that it had addressed the problems it experienced at that time with updating the Interactive Voice Recognition system

with information from field staff. Disappointingly, this issue was again a contributor to the poor call centre performance during the heatwave.

Perhaps the key conclusion made by the Commission from the point of view of poor customer service, and which may be identified as the key contributor to customer frustration, is the inadequacy of ETSA Utilities' information management during the heatwave.

The shortcoming of most concern is the failure to centralise and disseminate information relating to the existence or restoration of outages on the low voltage network. This failure had both upstream and downstream impacts. The lack of information on the status of low voltage outages meant that the Network Operations Centre was not fully aware of the extent of issues on the network. This led in turn to scheduling of jobs not being as efficient as possible, compounding the dilemmas in the field. On the downstream side, the lack of information meant that customers who did get through to the call centre were not given accurate and/or up-to-date information on the existence of, or likely duration of, outages which they were experiencing.

While the Commission has made a number of recommendations in this area, it acknowledges that ETSA Utilities has advised that it will adopt a number of initiatives to address the problems found during the heatwave. These involve improving its call handling capability through:

- the establishment of a 50 seat Keswick (South Australia) Overflow Call Centre in the case of major/extreme events and the transferring of calls directly to that Overflow Call Centre once staff are available;
- updating the Interactive Voice Recognition messaging; and
- updating the Operational Contingency Plan.

Commission's Recommendations: Information Management

The Commission recommends that ETSA Utilities consider the adoption and implementation of a more integrated communications strategy (during extreme weather events involving extensive outages), which encompasses the following matters:

- ***detailed and reliable information on expected restoration times updated to the IVR system on a regular basis;***
- ***regular updates to key media outlets during extreme weather events, including access to ETSA Utilities' personnel, rather than assuming that media staff will have the understanding and take the time to interpret website information (at least initially);***
- ***maintaining reliable, accurate and timely information on the ETSA Utilities' website;***

- ***generating information (for internal purposes) on call centre overload events (this information would also be required to be incorporated into periodic performance reporting to the Commission); and***
- ***appointment of depot liaison officers to the emergency management team.***

The Commission also recommends that ETSA Utilities complete the implementation of the Outage Management System and connectivity model by the end of 2006.

ETSA Utilities' compliance with its regulatory obligations

The Inquiry Terms of Reference require the Commission to consider ETSA Utilities' compliance with its regulatory obligations during the heatwave and to make recommendations with regard to any changes that could be made to the regulatory framework to better protect South Australian consumer interests, including appropriate incentives and penalties.

The Commission has reviewed the extent to which ETSA Utilities meets a standard of good electricity industry practice in its management of extreme weather events such as the heatwave. The Commission has found that ETSA Utilities meets the good electricity industry practice requirements in the areas of network management and resource management, but that there is some doubt that ETSA Utilities' performance during the heatwave was consistent with a good electricity industry practice standard in the area of information management.

The Commission has also found that Guaranteed Service Level payments by ETSA Utilities to customers associated with lengthy outages during the heatwave were not all made during the three-month period following the event as required by the regulatory regime.

While the heatwave has revealed certain inadequacies in the manner in which ETSA Utilities has maintained appropriate levels of reliability and customer service performance during extreme weather events, the Commission does not believe that this suggests the need for major changes to the current framework of network reliability and customer service standards for ETSA Utilities. The framework provides appropriate incentives to ensure that ETSA Utilities is motivated to redress poor performance.

On the basis of the information before the Inquiry, the Commission has reached the following conclusions with respect to regulatory compliance:

- In failing to make all of the required outage duration Guaranteed Service Level payments to customers entitled to receive them within the prescribed three-month period, ETSA Utilities has, on the facts before the Inquiry, failed to comply with the requirements of the Electricity Distribution Code. As a result, it also failed to comply with the requirements of clause 6(1)(d) of its electricity distribution licence. The Commission has reached the conclusion that the appropriate means of dealing with this matter is through a comprehensive audit of ETSA Utilities' Guaranteed Service Level payment systems and processes, which is currently in progress.

- ETSA Utilities met good electricity industry practice in network management and resource management, although both ETSA Utilities and the Commission have identified opportunities for improvement in those areas.
- There is some doubt that ETSA Utilities' information management performance was consistent with a good electricity industry practice standard at the time of the heatwave.
- While the Guaranteed Service Level payment scheme provides significant incentive to ETSA Utilities to change its supply restoration practices to reduce the level of payments, it is appropriate that a further band be added to the scheme to provide an additional financial incentive for ETSA Utilities to ensure that the restoration times of the heatwave are not repeated; whether in future extreme weather events or in general restoration practices.
- Consideration will be given to establishing additional telephone responsiveness standards, such as an additional annual standard relating to the average wait time for callers wishing to talk to an operator.
- ETSA Utilities will be required to report on the number of overload calls (that is, customer calls not able to get through to the call centre), commencing no later than the September 2006 regulatory reporting quarter.
- For reasons set out in detail in section 11.5 of this Inquiry Report, which include acknowledgment of the more than $1 million in financial penalties already incurred by ETSA Utilities, as well as the lack of intent on the part of ETSA Utilities to perform poorly during the heatwave, the Commission will not take legal action against ETSA Utilities in relation to the events which occurred during the heatwave. The Commission will, however, implement a comprehensive audit program in relation to areas of concern identified through this Inquiry (noting that, as identified above, the Commission is already auditing ETSA Utilities' Guaranteed Service Level payment systems and processes)

Commission's Recommendations: Regulatory Obligations

Consideration will be given (through a consultative process under the Essential Services Commission Act 2002) to amending the Electricity Distribution Code to include:

- ***an additional threshold for outage duration Guaranteed Service Level payments, such that a payment of $320 will be made to any customer affected by an outage of greater than 24 hours duration (the current maximum is $160 for an outage of more than 18 hours' duration);***
- ***additional telephone responsiveness standards, such as an additional annual standard relating to the average wait time for callers wishing to talk to an operator;***
- ***minimum levels of service to be met by ETSA Utilities for the call centre Interactive Voice Recognition system, to be applied during extreme weather events;***

- ***a requirement to report on the number of overload calls (that is, customer calls not able to get through to the call centre), commencing no later than the September 2006 regulatory reporting quarter.***

General observations

To give some context to its conclusions and recommendations, the Commission makes the following general observations.

First, while there can be no doubt that the period from 19 to 22 January 2006 was hot, it is generally acknowledged that summers in South Australia are hot. The occurrence of a heatwave cannot, therefore, be regarded as a highly unusual event. It follows that it is reasonable for the community to have an expectation that the South Australian electricity network will be designed and operated so as to generally cope with such conditions.

Secondly, the electricity supply system is fundamental to the economic and social infrastructure of a modern society. At the same time, however, it is important to realise that electricity distribution systems are not perfect and, moreover, that there are necessary trade-offs between the level of service that is provided and the prices that customers pay.

It may be technically possible to design a network that continues to operate without failures no matter what the level of demand for electricity might be from time to time. Building, operating and maintaining such a network would, however, be extremely costly and would require customers to pay prices many times higher than they do now if such a standard was required of ETSA Utilities' distribution network.

Nevertheless, it is important that ETSA Utilities provides the best level of service for the revenue it is entitled to earn in accordance with the Commission's Electricity Distribution Price Determination.

Thirdly, it should not be inferred from the fact that the Minister referred an Inquiry to the Commission that ETSA Utilities was itself satisfied with its performance during the heatwave, nor should it be thought that it has done nothing to address community concerns since the heatwave. While this Inquiry Report does identify areas of concerns in ETSA Utilities' systems and processes, the Commission recognises that ETSA Utilities has undertaken significant work and developed important new programs aimed at improving its performance since the heatwave occurred.

Fourthly, the Commission observes that neither it, as the economic regulator for the electricity distribution business, nor the Energy Industry Ombudsman, have received an unusual level of contacts from customers concerning the events which occurred during the heatwave. The Commission understands, however, that ETSA Utilities did receive a number of contacts from customers in the period following the heatwave and put significant resources into responding to customers and seeking to address their concerns.

Finally, while there can be no doubt that the January heatwave and the resultant impacts on the distribution network had a significant effect on the lives of some South Australians during the heatwave of 19 to 22 January, recent heatwaves and associated blackouts elsewhere in the world, such as the United States of America and Europe have emphasised that this is not solely a South Australian phenomenon.

Experiences such as those show that while, as demonstrated in this Inquiry Report, there are concerns over some of the actions of ETSA Utilities in relation to its performance during the heatwave, care needs to be taken not to assess that performance without regard to events, practices and outcomes elsewhere.

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GLOSSARY OF TERMS

ABN	Australian Business Number
ACN	Australian Company Number
ADMD	After Diversity Maximum Demand, the maximum demand for an area after considering the diversification of peak loads which occur at different times
AS	Australian Standard
AUGUST 2005 STORMS	Refers to the 29-31 August 2005 Storm event affecting many parts of SA
BOM	Bureau of Meteorology
CAIDI	Customer Average Interruption Duration Index**,** means the average duration of each supply interruption per customer who experienced a supply interruption within the distribution network (or defined part of the distribution network)
CAMS	Construction and Maintenance Services – the ETSA Utilities department responsible for field crews and emergency response crews who operate, repair and maintain the network infrastructure
CBD	Central Business District
CEO	Chief Executive Officer
CITIPOWER	Citipower Pty ACN 064 651 056, holder of a distribution and retail licence in Victoria
COMMISSION	Essential Services Commission of SA, established under the ESC Act
DISTRIBUTION	Refers to the operation of equipment used to convey electricity or gas through a distribution network
DISTRIBUTION CODE	Electricity Distribution Code, made by the Commission on 1 January 2003, pursuant to Section 28 of the ESC Act, and as subsequently varied by the Commission
DRAFT INQUIRY REPORT	Refers to the Commission's draft report produced for the purposes of this Inquiry process, available at www.escosa.sa.gov.au/site/page.cfm?c=1643
EDPD	Electricity Distribution Price Determination, released by the Commission in April 2005
EIO	Energy Industry Ombudsman SA Ltd
ELECTRICITY ACT	*Electricity Act 1996* (SA)
ERG	Emergency Response Group (ETSA Utilities)
ERL 0/1/2/3	Emergency Response Level 0/1/2/3
ESC ACT	*Essential Services Commission Act 2002*
ESDP	Electricity System Development Plan
ESCV	Essential Services Commission, Victoria
ESIPC	Electricity Supply Industry Planning Council
ETSA UTILITIES	ETSA Utilities (ABN 13 332 330 749) is a partnership of CKI Utilities Development Limited (ABN 65 090 718 880), HEI Utilities Development Limited (ABN 82 090 718 951), CKI Utilities Holdings Limited (ABN 54 091 142 380), HEI Utilities Holdings Limited (ABN 50 091 142 362) and CKI/HEI Utilities Distribution Limited (ABN 19 091 143 038) which is authorised to operate an (SA) electricity distribution network by an electricity distribution licence issued by the Commission under section 17(1) of the *Electricity Act 1996*
FDL	Fire Danger Level
FEEDER	Refers to a part of the distribution network through which supply to a defined group of customers is directed. The ETSA Utilities' network comprises about 1,200 feeders

GEIP	Good Electricity Industry Practice
GENERATION	Refers to the operation of any kind of electricity generating plant
GIS	Geographic Information System
GSL SCHEME	Guaranteed Service Level Scheme
GWH	Giga Watt hour, which is the equivalent of 1,000 MWh
HEATWAVE	In general refers to either 3 consecutive days of temperatures with maximums above 40 ºC, or 5 consecutive days with maximum temperatures above 35 ºC, but as used in this Report can also refer to the four-day heatwave event that occurred over the period 19 January to 22 January 2006
HV	High Voltage – defined in the National Electricity Rules to be greater than 1kV.
IC	Incident Co-ordinator (ETSA Utilities)
ISSUES PAPER	Refers to *Essential Service Commission Act 2002-Part 7 Inquiry, ETSA Utilities' Network Performance and Customer Response January 2006 – Issues Paper*, February 2006, available at www.escosa.sa.gov.au/site/page.cfm?c=1643
IVR	Interactive Voice Response, an automated system used for answering telephone calls
KV	kilo Volt
KVA	kilo Volt Amperes
KW	kilowatt
KWH	Kilowatt hour
LV	Low Voltage – voltages other than High Voltage (HV - defined above)
MAIFI	Momentary Average Interruption Frequency Index
METERING CODE	Electricity Metering Code made by the Commission on 1 January 2003, pursuant to section 28 of the ESC Act, and as subsequently varied by the Commission
MIN	Minutes
MW	Mega Watt, which is the equivalent of one million Watts
MWH	Mega watt hour
NEM	National Electricity Market, arrangements for which are set out in the National Electricity Law, which is a Schedule to the *National Electricity (SA) Act 1996*
NEMMCO	National Electricity Market Management Company Ltd (ACN 072 010 327)
NER	National Electricity Rules, made under the *National Electricity Law* (which is contained in the *Electricity (South Australia) Act 1996*), which establishes the NEM. The NER replaces the National Electricity Code
NOC	Network Operations Centre (ETSA Utilities)
NZS	New Zealand Standard
OH&S	Occupational Health and Safety
OMS	Outage Management System
P.A.	Per annum
PB ASSOCIATES REPORT	Refers to PB Associates, *ETSA Utilities Network Performance and Customer Response During the Heatwave of 19-22 January* 2006, April 2006, available at www.escosa.sa.gov.au/site/page.cfm?c=1643
POE	Probability of Exceedance
POWERCOR	Powercor Australia Limited ACN 064 651 109, holder of a distribution and retail licence in Victoria
SA	South Australia

SAIFI	System Average Interruption Frequency Index, means the number of supply interruptions each customer experiences for the year when averaged over all customers on the distribution network (or defined part of the distribution network)
SCADA	Supervisory Control And Data Acquisition
SEC	Seconds
SES	State Emergency Service
SI SCHEME	Service Incentive Scheme, established under the Electricity Distribution Code for ETSA Utilities
SRMTMP	Safety, Reliability, Maintenance and Technical Management Plan
SSF	Service Standards Framework
TECHNICAL REGULATOR	Refers to the person holding the office of Technical Regulator established under Part 2 of the Electricity Act
TRANSMISSION	Refers to the operation of equipment used to convey electricity through a transmission network. The ElectraNet SA network consists of about 5,600 km of mostly 132 kV and 275 kV lines
TRANSMISSION CODE	Electricity Transmission Code, made by the Commission on 1 July 2003, pursuant to Section 28 of the ESC Act, and as subsequently varied by the Commission
VCR	Value of Customer Reliability
VENCORP	VENCorp is a Victorian State-owned Government entity and has major operational, planning and development roles for gas and electricity in Victoria's privatised energy industry.
VOLL	Value of Lost Load
WATT	A derived SI (International System of units) unit of power, defined as one joule per second
Wh	One watt hour, a unit of energy

1 "CLIMATE IS WHAT WE EXPECT, WEATHER IS WHAT WE GET" – THE JANUARY 2006 HEATWAVE

By any measure, it was very hot in Adelaide, and indeed the whole of South Australia, during January 2006. While the average maximum January daytime temperature in Adelaide is 28.8°C, in January 2006, the average daily maximum temperature was 31.9°C, with the maximum daytime temperature exceeding 30°C on 20 days.

Daytime temperatures in Adelaide rose steadily during the early part of January from around 25°C, reaching the high 30s by the end of the first week. The temperature then dipped somewhat for a few days down to around 30°C and then, from around 10 January, temperatures again rose steadily over the next week up towards the mid-30s.

From Thursday 19 to Sunday 22 January, a heatwave was experienced. The maximum daytime temperatures for Adelaide on each of those days exceeded 40°C, with a high of 43.1°C on Saturday 21 January. Exacerbating the discomfort, there was no let-up in the heat overnight, with the temperature exceeding 27°C for three nights in a row, culminating in an overnight minimum of 33.1°C on Saturday night.

Relief finally arrived on the afternoon of Sunday 22 January, when a cool change progressively moved across the State from the west, arriving in the metropolitan region by the mid-afternoon. That cool change was accompanied by strong winds and resulted in a gradual drop in temperature down to the low 20s.

According to the Bureau of Meteorology (BoM), these temperatures in metropolitan Adelaide constitute an official "heatwave" (being an observed sequence of 5 or more days with maximum day-time temperatures above 35°C, or 3 or more days with maximum day-time temperatures above 40°C – as was the case between 19 and 22 January).

Those living in metropolitan Adelaide did not suffer alone in the January 2006 heatwave. Extreme temperatures were also recorded during this period over the whole of South Australia, ranging from 47.4°C at Ceduna, 45.9°C at Renmark, 40.8°C at Mount Gambier and 43.1°C at Victor Harbor.

There can be no doubt that the heatwave was an extreme event; as the Commission has previously observed, perhaps the most extreme heatwave event in Adelaide since 1943.

1.1 Blackouts and a lack of information

Making the heatwave particularly uncomfortable for some of those living in metropolitan Adelaide was the fact that the electricity distribution network operated by ETSA Utilities[1]

[1] ETSA Utilities (ABN 13 332 330 749) is a partnership of CKI Utilities Development Limited (ABN 65 090 718 880), HEI Utilities Development Limited (ABN 82 090 718 951), CKI Utilities Holdings Limited (ABN 54 091 142 380), HEI Utilities Holdings Limited (ABN 50 091 142 362) and CKI/HEI Utilities Distribution Limited (ABN 19 091 143 038) which is authorised to operate an electricity distribution network by an electricity distribution licence issued by the Commission under section 17(1) of the *Electricity Act 1996*.

suffered various failures during the heatwave and, as a result, widespread power outages were experienced.

To make matters worse, many people were either not able to contact the call centre operated by ETSA Utilities to report or get information about a power outage or, if they did get through, were at times unable to get accurate information about the likely duration of a power outage affecting them. This caused many customers to make repeated calls to find out what was going on, adding to the pressures faced by the call centre.

The call centre was under considerable pressure during the heatwave, with calls per day to ETSA Utilities' faults and emergencies line exceeding 15,000 on 21 and 22 January 2006 (Saturday and Sunday), compared with an average of 1,200 per day (made to all lines) over the past five years.[2]

As ETSA Utilities itself has remarked, that situation resulted in longer than average duration phone calls when people finally got through to operators, as understandable frustrations were vented on the call centre staff.[3]

The impact of all events[4] on the electricity distribution network over the 96-hour period 19 to 22 January can be summarised as follows:

- Overall, approximately 96,600 customers (of some 760,000) were affected by power outages.
- Approximately 84,000 customers were affected by high voltage (HV) network interruptions, with 94% restored within 3 hours.
- Approximately 12,600 customers were affected by low voltage (LV) network interruptions, with 46% restored within 3 hours.
- 238 low voltage transformers either experienced fuse operations (211) or failures (27), out of 63,777 transformers connected to the network.[5]
- The average restoration time for all outages during the heatwave was 131 minutes compared to a normal average for a year of 100 minutes.
- For customers affected by outages on the LV network:
  - 564 customers were without electricity for more than 24 hours;

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2 The Commission notes that it has consistently received information from ETSA Utilities on telephone calls made to all of its lines rather than on a disaggregated basis (that is, calls to faults and emergencies line etc) over the past 6 years. ETSA Utilities reported only faults and emergencies line data to the Commission in relation to calls during the heatwave. In the absence of appropriate and verifiable historical data, the Commission has compared calls to the faults and emergencies line with the average of all calls received in order to provide some insight into the extent and impacts of telephone calls during this heatwave.

3 ETSA Utilities' 24 January 2006 *Distribution Network Performance 19-22 January 2006*, (report to the Commission), paragraph 3.23.

4 Those due to both heatwave and other causes such as vegetation and lightning, for country and metropolitan areas.

5 While ETSA Utilities' submission to the Issues Paper, page 22 refers to a total of 241 affected LV transformers, PB Associates Report, page 27 identified a total of 238 from ETSA Utilities response to the Commission's detailed Questionnaire, Question 30 (page 21). The transformer figures include failures due to all causes.

- 1,937 customers were without electricity for more than 12 hours but less than 24 hours; and
- 650 customers were without electricity for more than 8 hours but less than 12 hours.

Putting these figures and statistics to one side for a moment, however, the Commission is also keenly aware that the blackouts had significant impacts on South Australians during the period 19 to 22 January 2006.

Over the past 100 years, societies have come to depend on a reliable supply of electricity as an essential service - essential in the sense that the availability of many of those things regarded as fundamental in our everyday life - such as communications, lighting, entertainment, food and water supply, heating and cooling - depend to a great extent on the availability of electricity. When it is unavailable, particularly when it is hot, people can become angry and distressed.

Of course, everyone knows that the power and the lights will go out from time to time, be it that the outage is caused by a car hitting a stobie pole, a possum short-circuiting a powerline, someone accidentally digging up an underground cable, the effects of a lightning storm or the impacts of massive and sudden increases in the amounts of electricity being drawn from the system. At the same time however, there is, or needs to be, a general community understanding that providing an uninterrupted supply of electricity presents an enormously complex and expensive technical challenge – even without those common causes of power outages. While it might be technically possible to build a distribution network which rarely fails, the costs associated with such a network would lead to electricity prices being significantly higher than they are now.

Such realisations do not, however, provide much comfort during a heatwave, when the air conditioner does not work and the phone lines are busy so that customers cannot get through to report, or find out about, the blackouts being experienced.

1.2 What were the costs to ETSA Utilities?

ETSA Utilities also suffers when its services fail; albeit in a different way than do its customers. It is in ETSA Utilities' best interests to keep the power on for both financial and customer service reasons. While it is a monopoly service provider, reductions in sales and reputational damage have very real business impacts for ETSA Utilities.

As ETSA Utilities delivers services to customers under a contract, it is exposed to the need to pay compensation to those of its customers that suffer loss as a result of power supply interruptions (where the interruption is not caused by the customer). To date, ETSA Utilities has paid in excess of $550,000 to such customers as a result of the power outages during the heatwave, and has advised the Commission that it expects this amount to rise to over $600,000 by the time that all claims are settled.

In addition, as is explained in detail later in this Inquiry Report, the incentive-based regulatory regime established by the Commission to regulate the behaviour of ETSA Utilities requires ETSA Utilities to make Guaranteed Service Level (GSL) payments to customers who do not have power restored after an outage within an acceptable time frame. As a result of the outages during the heatwave, ETSA Utilities has paid a total of $535,360 in outage duration GSL payments to 4,057 South Australians.

In total, therefore, the failures on ETSA Utilities' electricity distribution network, and the associated power outages, which occurred during the heatwave of 19 to 22 January 2006 have already cost ETSA Utilities more than $1 million in payments to customers. This represents a significant financial penalty to ETSA Utilities in relation to its performance during the heatwave – exceeding the amount of any penalty that could be sought by the Commission from a Court were it to seek to prosecute ETSA Utilities in relation to that performance.

In addition to these amounts, there is likely to be a financial impact on ETSA Utilities under the Service Incentive (SI) Scheme imposed through the Electricity Distribution Price Determination. That scheme operates to financially penalise or reward ETSA Utilities based on the level of service provided to its worst-served customers – approximately 15% of the customer base. While the impact of the heatwave on the SI scheme is expected to be relatively small, it should be noted that the impact on the SI scheme from other extreme weather events, such as storms, can be more significant. For instance, ETSA Utilities has estimated the impact of the August 2005 storms on the SI scheme as involving a penalty of $7.5 million.[6] These impacts cannot be quantified until early in 2007, as the SI scheme operates on a calendar year basis.

As well as these financial penalties, which well exceed $1 million in total, internal recognition of the level of its performance during the heatwave has caused ETSA Utilities to implement several improvements to its systems and processes to enable it to better manage extreme weather events in the future. These include:

- improvements in its emergency response level procedures;
- new arrangements for its personnel, including financial incentives, to maximise the number of staff available to respond to such events outside of normal business hours;
- new and improved procedures for handling outage notifications in a centralised manner;
- full implementation of the Outage Management System;
- adoption of a new maximum restoration time policy, including an outage time component such that customers without power for 10 hours or who have experienced multiple outages are prioritised; and
- improvements to call centre capabilities by establishing a 50 seat overflow call centre at Keswick and reviewing the Interactive Voice Response plan.

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6 Email from ETSA Utilities to the Essential Services Commission of SA dated 6 February 2006. Calculated as a loss of bonus of $1.5 million for each of the next 5 years.

ETSA Utilities anticipates that these initiatives will assist in a reduction in numbers of customers experiencing extended outages during extreme weather events. It also expects that information flowing from and to ETSA Utilities during such events will improve markedly as well.

Such actions on the part of ETSA Utilities are welcomed and display an appropriate and proportionate response on its part to its acknowledged poor performance during the heatwave in a number of critical areas.

1.3 It doesn't only happen in South Australia

While there can be no doubt that the January heatwave and the resultant impacts on the distribution network had a significant effect on the lives of some South Australians during the weekend of 21 and 22 January, recent events elsewhere in the world have emphasised that this is not solely a South Australian phenomenon.

A heatwave in the United States of America in July of this year saw record temperatures (reaching 48°C in Phoenix), record levels of demand for electricity across the country (50,270 MW in California on 24 July) and extensive blackouts caused by equipment failure affecting hundreds of thousands of people for extended periods of time – in some cases up to a week or more. For example, it has been reported that some 6,000 residents of the Queens district of New York were without power for over nine days (with up to 100,000 residents being without power for significant periods, albeit shorter than nine days).[7] Further, some 50,000 households in California suffered power outages on Saturday 22 July, with more than 700,000 households having experienced a power outage of some duration during the preceding two weeks of heatwave conditions.

Experiences such as these show that while, as demonstrated in this Inquiry Report, there are concerns over some of the actions of ETSA Utilities in relation to its performance during the heatwave, care needs to be taken not to assess that performance without regard to practices and outcomes elsewhere.

[7] See, for example, the New York State Public Service Commission Inquiry into the July Heatwave Outages, http://www.dps.state.ny.us/06E0894.htm.

2 THE MINISTER REFERS AN INQUIRY

There was a significant degree of public disquiet surrounding the operation of the electricity distribution network and the call centre during the heatwave. As a result, on 31 January 2006 the Minister for Energy referred a formal Inquiry to the Essential Services Commission ("the Commission") to investigate and make recommendations about the reliability and customer service performance of ETSA Utilities during the heatwave.[8] The Minister referred the Inquiry to the Commission having had regard to the Commission's Preliminary Report dated 28 January 2006.[9]

The Terms of Reference for the Inquiry require the Commission to:

- investigate the performance of the electricity distribution network operated by ETSA Utilities and the adequacy of ETSA Utilities' response during the heatwave conditions experienced in South Australia from 19 to 22 January 2006;
- determine whether or not ETSA Utilities complied with its regulatory obligations as established under the Electricity Distribution Code and the Electricity Act 1996, and if those obligations should be amended in light of the heatwave conditions experienced in South Australia from 19 to 22 January 2006;
- determine if the payments available under the Guaranteed Service Level Scheme (GSL) should be increased to provide increased incentives for ETSA Utilities to meet determined levels of reliability;
- determine if the performance of ETSA Utilities was consistent with good electricity industry practice as defined in the National Electricity Rules; and
- make recommendations as it considers appropriate, in particular with regard to any changes that could be made to the regulatory framework to better protect South Australian consumer interests, including appropriate incentives and penalties.

In investigating and determining these matters, the Terms of Reference also require the Commission to consider a number of particular issues, as set out in clause 3.5 of the Notice of Inquiry.

In addition, in undertaking this Inquiry, the Commission is required by its governing legislation, the Essential Services Commission Act 2002 (ESC Act), to have regard to certain other matters.[10] Most importantly, the Commission must have as its primary objective protection of the long term interests of South Australian consumers with respect to the price, quality and reliability of essential services.

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8 A copy of the Terms of Reference for the Inquiry may be accessed from the Commission's website at http://www.escosa.sa.gov.au/site/page.cfm?u=27&c=1624.

9 See Essential Services Commission of SA, 28 January 2006, *Performance of ETSA Utilities' Electricity Distribution Network During the Heatwave of January 2006, Preliminary Report to the Minister for Energy* (Refer http://www.escosa.sa.gov.au/webdata/resources/files/060128-D-PerfETSAJanHeatWave.pdf).

10 See section 6 of the *Essential Services Commission Act 2002*.

2.1 The nature of an Inquiry

The core responsibility of the Commission in an Inquiry under the ESC Act is to investigate the factual circumstances of the matters that are the subject of the Inquiry, taking into account all points of view put forward in submissions. The Commission draws on the information it receives and information, research and expertise assembled from other sources to formulate its report on the matters within the scope of the Terms of Reference, having regard to any additional requirements of the referring Minister as specified in the Notice of Reference. The Inquiry process is fundamentally different in nature and scope from the adversarial judicial process.

In the course of the Inquiry the Commission makes conclusions and findings of fact (referred to in the Notice as 'determining' matters). In addition, the Commission also makes consequent recommendations as a part of that process (such as for changes to Industry Codes and reporting arrangements).

2.2 The process of the Inquiry

The process for undertaking the Inquiry is set out in the Notice of Referral and is also governed by Part 7 of the ESC Act.

2.2.1 Public consultation

In accordance with that process, the Commission published a notice in the Advertiser on Tuesday 7 February 2006 describing the Inquiry and setting out the full Terms of Reference, details of how to make a submission and how to access Inquiry papers.

In accordance with the requirements of clause 4.1.3 of the Notice of Referral, on 9 February 2006 the Commission released an Issues Paper: "ETSA Utilities Network Performance and Customer Response 2006".[11] That Issues Paper set out various background material, based on the evidence then available, to assist stakeholders wishing to comment on the Terms of Reference.

The Commission also prepared a Customer Questionnaire to enable South Australians to provide details of their experiences during the heatwave.[12]

In order to ensure wide community awareness of the Inquiry and the questionnaire, the Commission published a second notice in the Advertiser on 18 February 2006 and notices in all regional papers and the Messenger press in the week commencing 20 February 2006.

The Commission received four submissions to the Issues Paper and 18 customer questionnaire responses, all of which have been taken into account in the preparation of this Inquiry Report.

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11 Copies of Commission material and papers concerning the heatwave are available on the Commission's website at www.escosa.sa.gov.au/site/page.cfm?c=1643.

12 A copy of the Questionnaire can be accessed from the Commission's website at www.escosa.sa.gov.au/site/page.cfm?c=1643.

In June 2006, the Commission released a Draft Inquiry Report as required by clauses 4.1.4 and 4.1.5 of the Notice of Referral. The Draft Inquiry Report set out the draft findings and recommendations of the Commission in relation to the matters referred to it by the Minister.

Three submissions were received on the Draft Inquiry Report, one from a member of the public, one from ETSA Utilities and one from the Minister for Energy.[13]

2.2.2 Extent of submissions

In the context of the number of South Australians affected by power outages during the heatwave, there were a surprisingly small number of responses to the Inquiry processes. Having considered this matter in some detail, and having made relevant inquiries, the Commission has ascertained that a large number of customers affected by the heatwave dealt directly with ETSA Utilities regarding their concerns.[14] This is appropriate, as the customer should first attempt to resolve any issues directly with ETSA Utilities, with the Energy Industry Ombudsman (EIO) only called upon to deal with issues of unresolved disagreement between customers and ETSA Utilities.[15]

To the extent that customers received satisfaction in their dealings with ETSA Utilities, this could offer an explanation as to why the Commission received such a relatively low number of submissions to its Issues Paper and Draft Inquiry Report. On this basis, the Commission commends ETSA Utilities for its customer responsiveness following the heatwave.

2.2.3 PB Associates

In addition to the public consultation process, in order to ensure that it properly informed itself on relevant matters through the Inquiry, the Commission contracted a consulting firm, PB Associates, to provide detailed technical advice on specific matters relating to the Terms of Reference. PB Associates provided the Commission with a report during the Inquiry, a copy of which is available on the Commission's website.[16]

In preparing that report, PB Associates liaised extensively with ETSA Utilities to assess the nature of its response to the heatwave. With the assistance of PB Associates, the Commission forwarded a detailed Questionnaire to ETSA Utilities in early February 2006 which sought a range of information on ETSA Utilities' preparations for, and its organisational response during, the heatwave. The results of that Questionnaire, supported by on-site discussions with ETSA Utilities staff, provided the key source of information upon which the Commission relied in making findings and conclusions regarding ETSA Utilities' performance during the heatwave.

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13 Submissions received in response to the Draft Report are available from the Commission's website, refer http://www.escosa.sa.gov.au/site/page.cfm?u=27&c=1624.

14 ETSA Utilities, *March Quarter 2006 Statistical Return for Guideline No.1* ("Electricity Regulatory Information Requirements - Distribution, Guideline No.1", July 2005) shows that the number of written enquiries received by ETSA Utilities in the March Quarter 2006 was 30% higher than the total number of written enquiries received for the whole of 2004/05.

15 The Energy Industry Ombudsman (EIO) has advised the Commission that his Office received few complaints from customers about electricity supply matters arising from the heatwave.

16 See PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, at http://www.escosa.sa.gov.au/site/page.cfm?c=1643.

A copy of the detailed Questionnaire provided to ETSA Utilities is reproduced as Appendix B in PB Associates' report. The completed Questionnaire and attachments provided by ETSA Utilities has not been published on the Commission's website as that material is confidential. Nevertheless, the Inquiry Report cites important aspects of that material as appropriate and references the questions from the Questionnaire so that interested parties can determine the context of questions asked of ETSA Utilities.

Having reviewed the information provided in the submissions to the Draft Inquiry Report, and having further reviewed all of the other evidence and information made available to the Commission during the course of the Inquiry process, the Commission has prepared this Inquiry Report for submission to the Minister for Energy.

2.3 Structure of this Inquiry Report

This Inquiry Report is structured so as to satisfy each of the requirements of the Terms of Reference in turn.

Chapters 3 to 9 are dedicated to an investigation of the performance of the distribution network and the adequacy of ETSA Utilities' response during the heatwave. Of necessity, there is considerable technical and evidentiary detail in these Chapters and considerable discussion of the nature of the distribution network and the work undertaken by ETSA Utilities in operating and maintaining it. It should also be noted that the considerations specified by the Minister in clause 3.5 of the Notice of Inquiry, being matters of fact, are largely dealt with in these Chapters.

Chapter 10 considers whether or not ETSA Utilities' performance during the heatwave was consistent with good electricity industry practice (as defined in the National Electricity Rules).

Chapter 11 explores whether or not ETSA Utilities complied with its regulatory obligations and makes determinations as to whether those obligations require any amendment. The Chapters includes specific consideration as to whether or not the payments available under the GSL Scheme should be increased.

Finally, Chapter 12 sets out the full set of recommendations of the Commission in relation to the matters that are the subject of this Inquiry and the Commission's next steps as a result of those recommendations.

3 THE ELECTRICITY DISTRIBUTION SYSTEM AND THE REGULATORY FRAMEWORK

In order to give some context to the analysis in this Inquiry Report, it is useful at the outset to review two key matters:

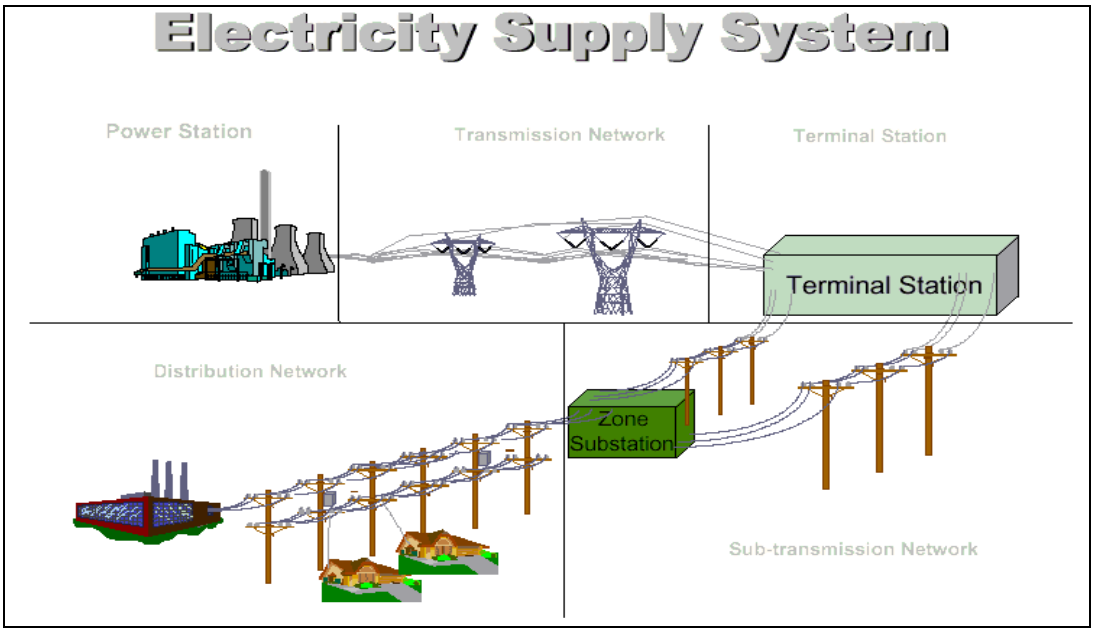
- the SA electricity supply industry, the role of ETSA Utilities in that industry; and
- the regulatory regime that applies to ETSA Utilities.

3.1 The South Australian electricity supply industry

The electricity supply industry in SA is separated into generation, transmission, distribution and retail sectors. Two sectors, distribution and transmission, have natural monopoly characteristics and are therefore separated to ensure that the industry structure does not impede competition in the generation and retail sectors.

Figure 3.1 represents, in a simple diagrammatic form, the manner in which electricity is supplied from generators to end-use customers. ETSA Utilities is responsible for the sub-transmission and the distribution network elements of the system as depicted in the diagram.

Figure 3.1: Overview of Electricity Supply System[17]



[17] ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006",* page 9.

The distribution network is made up of high voltage (HV) feeders that distribute electricity to transformers, which generally step down the voltage from 11,000 volts (11kV) to 415/240 volts, which is then distributed through the low voltage (LV) network to supply households and small businesses. Most residential households are supplied by one 240-volt LV phase from a transformer.

In physical terms, the electricity distribution system operated by ETSA Utilities includes:

- Subtransmission powerlines (66kV and 33kV);
- Zone substations where voltage is transformed from sub-transmission voltages (e.g. 66kV) to high voltage (eg 11kV);
- High voltage feeders which transport electricity from zone substations and other substations (approximately 300 supply the State) to transformers near customers; and
- Low voltage circuits/feeders which transport electricity at 415/240 volts to customers' premises.

ETSA Utilities supplies electricity to about 761,000 customers. It operates and maintains a network with about 80,600 km of power lines, of which about 86% is overhead. About 70% of the power lines comprising the network are operated at HV (7.6 kV and above) with the remainder at LV(415/240V). The distribution network also includes 393 substations, 1,420 sub-transmission transformers, about 64,900 distribution transformers (including transformers with an LV secondary), and about 723,000 stobie poles.[18]

3.2 The regulatory regime applying to ETSA Utilities

Economic regulatory oversight of regulated industries that provide essential services to South Australians is the responsibility of the Commission (as established by the Government in 2002 under the ESC Act). As noted previously, the primary objective of the Commission when undertaking its functions is to protect the long-term interests of SA consumers with respect to the price, reliability and quality of essential services.

The electricity supply industry is a regulated industry for the purposes of the ESC Act and the Commission therefore has regulatory functions in respect of those who carry on activities (including the distribution of electricity) within that industry. These functions, which include the responsibility for licensing, service standard setting, monitoring and pricing, are specified in the Electricity Act.

As a result, ETSA Utilities is licensed by the Commission to operate the National Electricity Market (NEM) connected electricity distribution network in SA. As a condition of its licence, ETSA Utilities is required to operate within a regulatory regime and to comply with, among other things, various Acts and statutory instruments, including the National Electricity Rules

[18] ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006",* page 9.

(NER), various industry codes issued by the Commission, as well as the terms of binding price determinations which control the prices which ETSA Utilities may charge customers.

There is a complex interplay between the various aspects of this regime.

As a monopoly service provider, ETSA Utilities is subject to a price control regime for distribution network charges. The price control regime currently in place was established by the Commission through the Electricity Distribution Price Determination (EDPD) in 2005.[19] In establishing the EDPD, the Commission in effect set a regulatory bargain between electricity consumers and ETSA Utilities, wherein providing a reasonable return on investment to ETSA Utilities was balanced with the need for ETSA Utilities to provide sustainable services at an agreed standard as specified in the Electricity Distribution Code.[20]

The Electricity Distribution Code (one of the industry codes issued by the Commission) therefore plays a fundamentally important role in the regulatory arrangements. It regulates the terms on which ETSA Utilities may connect customers to its network and supply electricity to customers, including a service standard framework that applies to ETSA Utilities in operating the electricity distribution network.

There are three distinct elements to the service standard framework: the specification of average service standards to be met by ETSA Utilities; a Service Incentive scheme under which ETSA Utilities is rewarded or penalised in terms of its revenue allowance based on whether it meets specified standards; and a Guaranteed Service Level (GSL) payment scheme, under which customers are entitled to payments (not compensation) where they individually are not provided with service of a standard specified by the Commission.

3.3 Average service standards

The service standard framework is a set of average service standards contained in clause 1.2 of Part A of the Electricity Distribution Code, which underpin the distribution prices that ETSA Utilities charges its customers. Being “average” standards, they are expressed in terms of the average performance provided to customers in a particular region of the ETSA Utilities network over a 12-month period.

There are three elements in the service standard framework for ETSA Utilities, each of which is discussed in turn below.

3.3.1 Reliability

Reliability is measured by the frequency and duration of supply interruptions experienced by customers. In discussing reliability of electricity supply, it is important

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19 See the Electricity Distribution Price Determination website page on the Commission’s website at www.escosa.sa.gov.au/site/page.cfm?u=163.

20 Other elements of the SSF are contained in the Electricity Metering Code and Energy Customer Transfer and Consent Code as established by the Commission, and in the Electricity Act and Regulations. Codes made by the Commission that apply to electricity entities are available from http://www.escosa.sa.gov.au/site/page.cfm?u=54#e71.

to note that supply interruptions experienced by customers can originate from problems at power stations, transmission lines (275 kV and 132 kV), and the distribution network (66 kV and less).[21] The focus of this Inquiry, in terms of reliability of supply, is with interruptions that originate from the distribution network.

Key measures when considering reliability performance are:

- *System Average Interruption Duration Index*, referred to as "SAIDI": this is a measure of how long each customer is without supply for the period under consideration (e.g., a year) when averaged over all customers in the network (or specified parts of the network).[22]
- *System Average Interruption Frequency Index*, referred to as "SAIFI": this is a measure of the number of supply interruptions each customer experiences for the period (e.g., a year) when averaged over all customers on the network (or specified parts of the network).[23]

Clause 1.2.3 of Part A of the Electricity Distribution Code specifies that ETSA Utilities must use its best endeavours[24] to achieve the SAIDI and SAIFI reliability targets specified in Table 3.1 and Table 3.2 during each year (ending 30 June).[25] As average standards, they apply for a given financial year and ETSA Utilities is required to meet them over the course of a year, rather than necessarily for a single (extreme weather) event.

The calculation of SAIDI and SAIFI requires a measure of the number of customers affected by each interruption, with SAIDI also requiring an estimate of the duration of each interruption.

In relation to the number of customers affected, ETSA Utilities is in the process of installing a sophisticated Outage Management System (OMS) that will assist in accurate measurement of this parameter for each interruption. The duration is estimated as the difference between the start time for the interruption (as reported by a customer) and the restoration time (as reported by field crews).

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21 For more information on these issues, refer to the Commission's information brochure *Electricity Supply Interruptions: The Facts*, available from http://www.escosa.sa.gov.au/webdata/resources/files/060120-D-ElectricitySupplyInterruptions.pdf.

22 Both planned and unplanned interruptions are included in the SAIDI measure. From time to time it is necessary for ETSA Utilities to undertake planned interruptions of supply to customers. This may be necessary to enable ETSA Utilities to undertake maintenance, augmentations and extensions on the network, to connect a new supply address, for emergency purposes and for other reasons. Procedures for carrying out planned interruptions are dealt with at clauses 1.2.3.2 to 1.2.3.5 of the Electricity Distribution Code. In particular, ETSA Utilities is required to give at least 4 business days' notice to each customer affected by a planned interruption. Typically, about 10% of an annual SAIDI figure for a region is caused by planned interruptions

23 In SA, interruptions of less than 30 seconds duration are not included in this measure. Both planned and unplanned interruptions are included in the SAIFI measure.

24 The term "best endeavours" is defined in the Electricity Distribution Code as *"to act in good faith and use all reasonable efforts, skill and resources*".

25 These standards are based on the performance averaged across all customers connected to the ETSA Utilities network within the specified regions. They were determined during the process of finalising the EDPD on the basis of historical reliability performance applying over the period 2000/01 – 2003/04. The regions are as defined in maps contained in Schedule 4 of Part A of the Electricity Distribution Code.

Table 3.1: SAIDI and SAIFI Targets

REGION	SAIDI (MINUTES)	SAIFI (INTERRUPTIONS)
Adelaide Business Area	25	0.30
Major Metropolitan Areas	115	1.40
Barossa/Mid-North & Yorke Peninsula/ Riverland/Murrayland	240	2.10
Eastern Hills/Fleurieu Peninsula	350	3.30
Upper North & Eyre Peninsula	370	2.50
South East	330	2.70
Kangaroo Island[26]	450	N/A

The ratio of SAIDI to SAIFI provides an estimate of an appropriate average time to restore supply for interruptions in the regions specified in Table 3.1 (e.g. about 80 minutes for the Major Metropolitan Areas). In developing the service standard framework, however, the Commission considered it important to specify also a standard for time to restore supply, as shown in Table 3.2.

Table 3.2: "Time to Restore Supply" Targets

SUPPLY RESTORATION TIMES FOR:	TARGET
Adelaide Business Area	90% within 2 hours 95% within 3 hours
Major Metropolitan Areas	80% within 2 hours 90% within 3 hours
Barossa/Mid North & Yorke Peninsula/ Riverland/Murrayland	80% within 3 hours 90% within 5 hours
Eastern Hills/Fleurieu Peninsula	80% within 3 hours 90% within 4 hours
Upper North/Eyre Peninsula	80% within 4 hours 90% within 6 hours
South East	80% within 4 hours 90% within 5 hours

Unlike the SAIDI and SAIFI average standards, the time to restore supply average standards do not incorporate planned interruptions.

The Commission's assessment of the reliability performance of ETSA Utilities over the regulatory period ending in June 2005 has shown that achievement of the "best endeavours" annual reliability performance standards of the type outlined in Table 3.1 and Table 3.2 is very dependent on the number and extent of severe weather events

[26] The determination of reliability performance standards for Kangaroo Island was the subject of a review process not directly linked to the EDPD (refer http://www.escosa.sa.gov.au/site/page.cfm?u=27&c=685). As part of this process, it was determined to be inappropriate to establish a separate SAIFI standard for Kangaroo Island.

impacting on the network during that year.[27] In its 2004/05 Performance Report for Energy Distributors, the Commission noted that:[28]

> *The Commission has no evidence to suggest that ETSA Utilities did not apply a best endeavours approach to meeting the relevant standards. Nevertheless, in its future assessment of this matter, the Commission will pay particular attention to the manner in which ETSA Utilities seeks to maintain network reliability during severe weather events.*

3.3.2 Quality of Supply

Quality of supply, which is measured by deviations of voltage from specified levels, concerns voltage occurring at a customer's supply address and at other points on the network. Clause 1.2.4 of Part A of the Electricity Distribution Code specifies that the distribution network must be designed, installed, operated and maintained such that voltage standards as specified in Table 3.3 are maintained.

Table 3.3: Quality of Supply

DESCRIPTION OF MEASURE	TARGET
Voltage	As set out in AS60038
Voltage fluctuations	Within limits as set out in AS/NZS 61000 Parts 3.3 and 3.5 and AS2279 Part 4
Harmonic voltage distortions	Do not exceed values in AS/NZS 61000 Part 3.2 and AS2279 Part 2 and as set out in the schedule to the standard connection and supply contract
Voltage unbalance factor in 3 phase supplies	Do not exceed values in the schedule to the standard connection and supply contract
Interference	Less than limits set out in AS/NZS 61000 Part 3.5 and AS/NZS 2344

3.3.3 Customer Service

Customer Service involves responsiveness by ETSA Utilities to telephone and written enquiries from customers, and the means by which disputes with customers are handled by ETSA Utilities. This average standard is measured by such attributes as timeliness of responses to telephone and written enquiries, and timeliness in providing written explanations for interruptions to supply after customer requests.

Clause 1.2.2 of Part A of the Electricity Distribution Code specifies that ETSA Utilities must use its best endeavours to achieve the level of customer service during each year (ending 30 June) as specified in Table 3.4. Each of these standards involves performance averaged across all customers that have made the specified form of

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27 See, for example, Essential Services Commission of SA, November 2005, *2004/05 Annual Performance Report: Performance of South Australian Energy Distributors*, section 3.2.2.6 (http://www.escosa.sa.gov.au/webdata/resources/files/051130-APR_EnergyDistributors.pdf).

28 Essential Services Commission of SA, November 2005, *2004/05 Annual Performance Report: Performance of South Australian Energy Distributors*, section 3.2.2, page 14 (http://www.escosa.sa.gov.au/webdata/resources/files/051130-APR_EnergyDistributors.pdf).

enquiry. Thus, for example, ETSA Utilities must employ best endeavours to ensure that at least 85% of all telephone calls are answered within 30 seconds.

Table 3.4: Customer Service Targets

DESCRIPTION OF MEASURE	TARGET
Time to respond to telephone calls	85% within 30 seconds (including calls after a major outage event)
Time to respond to written enquiries	95% within 5 business days
Time to provide written explanation for interruptions to supply	85% within 20 business days

Once again, these standards are average standards that apply for a given financial year and so ETSA Utilities is required to meet them over the course of a year, rather than necessarily for a shorter period, e.g. a single (extreme weather) event.

In relation to telephone responsiveness, all appropriate telephone numbers through which customers might make enquiries of ETSA Utilities are required to be included in the assessment of performance, including the Power Failures & Emergencies 24 hour line (13 13 66).

ETSA Utilities (as with all electricity distributors) operates an Interactive Voice Response (IVR) system that processes telephone enquiries by providing information (e.g. in relation to the status of restoration of supply following an interruption) or directing telephone enquiries to an operator.[29] When a caller selects an IVR option that involves speaking to an operator, the call is considered answered only when responded to by the operator.

The Electricity Distribution Code classifies a call as being answered within 30 seconds where the customer receives information from the IVR system within 30 seconds and does not elect to speak to an operator. This classification within the Electricity Distribution Code recognises that electricity distribution businesses can only respond efficiently to large volumes of telephone enquiries by use of an IVR.

There is no provision for exclusions due to a major outage event (e.g. associated with extreme weather conditions) in the measurement of telephone performance. Under such conditions, an electricity distributor's call centre may become overloaded as thousands of customers seek to report a supply interruption and/or ascertain how long their supply will be interrupted.

3.4 Service Incentive Scheme

A survey undertaken for the Commission of consumer preferences for improvements in electricity distribution services suggested that a significant proportion of consumers (around

[29] The IVR is an automated system used to assist in answering telephone calls and providing information to customers.

85%) were not willing to pay additional amounts to increase the level of reliability they receive.[30] Conversely, around 15% of consumers were willing to pay for improvements to their supply.

The Commission therefore formed the view that it was appropriate to provide a financial incentive within the workings of the current pricing regime for ETSA Utilities (the EDPD) which would encourage ETSA Utilities to improve service to the worst served consumers, comprising approximately 15% of the customer base.

This is achieved through the imposition of penalties and rewards in the price setting formula based on reliability performance and telephone responsiveness, referred to as the Service Incentive (SI) scheme. If ETSA Utilities outperforms the standards in the SI scheme, then it is rewarded by being able to recover increased revenue from its customers. Conversely, if it does not meet those standards, then penalties apply in terms of the permitted revenue recovery.

The reliability component of the SI scheme involves an examination of feeders (components of the distribution network) that have experienced 2 consecutive years of 3 or more interruptions or more than 180 minutes off supply. On the basis of historical performance, 18% of ETSA Utilities' customers meet this criterion, a result that is consistent with the intent of focussing on the worst served 15% of customers.

The telephone responsiveness component of the SI scheme involves an examination of the proportion of calls answered in 30 seconds, with a baseline target of 85% (equivalent to recent historical performance).

Schedule 2 of Part A of the Electricity Distribution Code specifies the manner in which ETSA Utilities will calculate its entitlement to incentive points under the SI scheme for each of the calendar years 2005 –2009. This entitlement is then incorporated into the annual revenue adjustment for ETSA Utilities that occurs in accordance with the EDPD on 1 July each year, commencing from 1 July 2006. The total financial incentive for the SI scheme has been capped at ±$37.5 million, which represents about ±1.6% of ETSA Utilities' prescribed distribution revenue over a five-year period.[31]

3.5 Guaranteed Service Levels

Both the average standards and the SI scheme involve an assessment of ETSA Utilities' performance as experienced by a group of customers (e.g. performance averaged across customers in the Major Metropolitan Areas, or the worst served 15% of customers). Neither relates directly to service as experienced by individual customers. The third major component of the service standard framework for ETSA Utilities, the Guaranteed Service Level (GSL) scheme, involves service provided by ETSA Utilities to individual customers.

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[30] See KPMG, March 2003, *Consumer Preferences for Electricity Service Standards*, available from www.escosa.sa.gov.au/resources/documents/030409-R-Final_CSReport.pdf.

[31] See Essential Services Commission of SA, April 2005, *2005-2010 Electricity Distribution Price Determination, Part B*, Schedule 3, clause 3.1(k) (https://www.escosa.sa.gov.au/webdata/resources/files/050609-D-EDPDPartB-PriceDetermination.pdf).

For this reason, the GSL scheme is established within Part B of the Electricity Distribution Code (the standard connection and supply contract between ETSA Utilities and its customers) and ETSA Utilities is contractually obliged to meet the relevant obligations relating to the GSL scheme for each customer connected to the distribution network.

Clause 5.3 of Part B of the Electricity Distribution Code establishes GSLs relating to:

- timeliness of an appointment with a customer (5.3(a));
- timeliness of connection of a new supply address (5.3(b));
- timeliness of repairing street lights that have gone out and for which ETSA Utilities is responsible (5.3(c)); and
- minimising the frequency and duration of supply interruptions (5.3(d)).

The first 3 of these GSLs were implemented when the Electricity Distribution Code was made in October 1999. The reliability-based GSLs were developed during the process of finalising the EDPD and took effect from 1 July 2005.

In clause 5.3(d) of the standard connection and supply contract, ETSA Utilities commits to "*do our best to minimise the frequency and duration of supply interruptions to your supply address*". It commits to make payments to the affected customers if the frequency of interruptions or duration of any single interruption exceeds the thresholds set out in Table 3.5 (frequency) and Table 3.6 (duration).

Table 3.5: Thresholds and payment amounts – frequency of interruptions

	THRESHOLD 1	THRESHOLD 2	THRESHOLD 3
No. of interruptions per annum	>9 and ≤12	>12 and ≤15	>15
Payment per annum	$80	$120	$160

Table 3.6: Thresholds and payment amounts – duration of a single interruption

	THRESHOLD 1	THRESHOLD 2	THRESHOLD 3
Duration (hrs)	>12 and ≤15	>15 and ≤18	>18
Payment per event	$80	$120	$160

It is important to appreciate that these payments are not compensatory in nature, in the sense that they are not intended in any way to provide recompense to a customer for any particular loss or injury they may have suffered as a result of the frequency of interruptions or duration of any single interruption. Rather, they reflect amounts that ETSA Utilities must pay in recognition of the fact that the supply did not meet the contractually specified standards.

Payments for compensation, in the sense of recompense for loss, are dealt with separately under clause 6 of the standard connection and supply contract. Care needs to be taken not to confuse the separate operation of these two clauses, as they have entirely different policy and legal bases.

Based on data provided by ETSA Utilities, the EDPD assumed that the total amount of payments that ETSA Utilities was expected to make each year for these two reliability-based GSLs, on current customer numbers, was approximately $1.2m (around 0.2% of annual distribution revenue). This amount was incorporated into ETSA Utilities' regulated revenue base for prescribed services.

If ETSA Utilities is able to improve service to the worst served customers and keep GSL payments below this amount, then it will be able to retain the benefit of avoided payments. On the other hand, it will be penalised by having to make more than expected GSL payments if reliability performance is below that forecast.

ETSA Utilities is required to make frequency of interruptions GSL payments to the affected customers in the quarter following the completion of the regulatory year (ending 30 June). Duration of interruptions GSL payments are required to be made within 3 months of the event occurring.

3.6 Good Electricity Industry Practice

A further important aspect of the service standard framework for ETSA Utilities relates to the concept of good electricity industry practice.

ETSA Utilities is able to charge customers for distribution services in accordance with the EDPD. Distribution services are defined in the EDPD to include such services as network and connection services and in turn, those services are defined such that they are to be provided in accordance with provisions of the Electricity Distribution Code, Electricity Metering Code and other applicable laws, and using good electricity industry practice. The National Electricity Rules (NER) define good electricity industry practice (GEIP) as:

> *The exercise of that degree of skill, diligence, prudence and foresight that reasonably would be expected from a significant proportion of operators of facilities forming part of the power system for the generation, transmission or supply of electricity under conditions comparable to those applicable to the relevant facility consistent with applicable regulatory instruments, reliability, safety and environmental protection. The determination of comparable conditions is to take into account factors such as the relative size, duty, age and technological status of the relevant facility and the applicable regulatory instruments.*

A determination of whether or not specific practices of ETSA Utilities are in accordance with GEIP for the purposes of the Inquiry requires a comparison of those practices with comparable practices in other Australian electricity distributors. The Minister has provided the Commission with a specific Inquiry term of reference to determine if the performance of ETSA Utilities was consistent with GEIP, as defined in the NER.

4 PERFORMANCE OF THE DISTRIBUTION NETWORK

Term of Reference 3.1 requires the Commission to investigate, first, the performance of the distribution network and, secondly, the adequacy of ETSA Utilities' response during the heatwave. Given the complexity of the issues associated with these two pats of Term of Reference 3.1, the Commission has considered them across a number of Chapters of this Inquiry Report.

This Chapter sets out the Commission's findings on the actual performance of the distribution network during the heatwave, including comparisons with planning forecasts of demand. Doing so, however, necessitates that the Commission consider in some detail what actually happened, in meteorological, network impact and customer impact terms, during the period 19 to 22 January.

4.1 The heatwave – the meteorological facts

South Australia experienced extreme high temperatures between 19 and 22 January 2006, with 4 continuous days of maximum daytime temperatures in excess of 40°C in the Adelaide metropolitan region (as recorded at the Bureau of Meteorology's Kent Town recording station).

During this period, the highest day-time temperature recorded at Kent Town was 43.1° C and the highest night-time minimum temperature was 33.1°C. These figures may be contrasted with the January Adelaide metropolitan area average daily maximum temperature of 28.8°C and daily minimum temperature of 16.8°C.

Such high temperatures over a 4-day period constitute a "heatwave". For Adelaide, the Bureau of Meteorology (BoM) defines a heatwave as 5 or more consecutive days with temperatures above 35°C, or 3 or more days with temperatures above 40°C.

Of note, leading up to the period of the heatwave, the daytime maximum temperatures for each of the four days preceding the heatwave were all in excess of 30^{o}C. Further, when compared to the average, January in 2006 was clearly a very hot month overall, notwithstanding the heatwave, with 20 days having daytime maximum temperatures of 30^{o}C or more. Indeed, whereas on average the January maximum temperature exceeds 40°C on only 1.2 days in each year, in 2006 a 40°C maximum was exceeded on 5 occasions.

Analysis by the Electricity Supply Industry Planning Council of the temperatures reached during the heatwave provides the following data:[32]

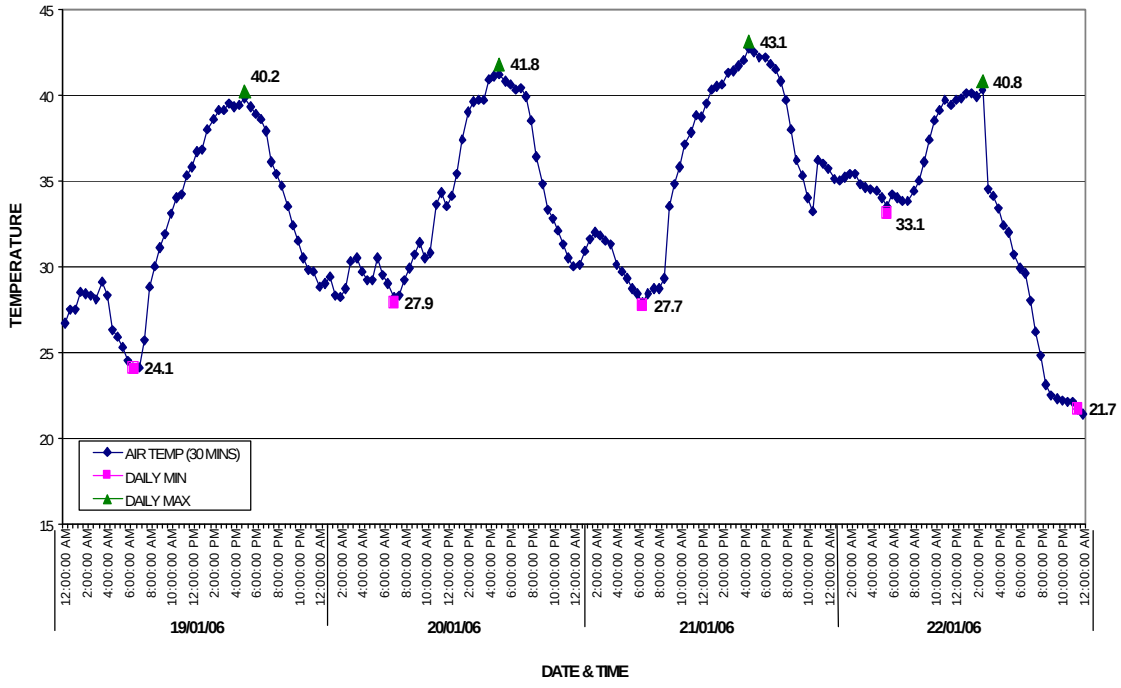
[32] Electricity Supply Industry Planning Council, Annual Planning Report, June 2006, pages 39 to 42. Refer http://www.esipc.sa.gov.au/site/page.cfm?u=269.

Table 4.1: BoM Recorded Temperatures 19- 22 January 2006

	KENT TOWN TEMPERATURE °C			AVERAGE METROPOLITAN TEMPERATURE °C (DEMAND WEIGHTED AVERAGE OF TEMPERATURE AT KENT TOWN, ELIZABETH, ADELAIDE AIRPORT AND NOARLUNGA)		
	OVERNIGHT MINIMUM	DAYTIME MAXIMUM	DAILY AVERAGE	OVERNIGHT MINIMUM	DAYTIME MAXIMUM	DAILY AVERAGE
THURSDAY 19 JAN	24.1	40.2	32.2	22.7	38.7	30.7
FRIDAY 20 JAN	27.9	41.8	34.9	27.7	40.3	34.0
SATURDAY 21 JAN	27.7	43.1	35.4	28.6	42.5	35.5
SUNDAY 22 JAN	33.1	40.8	37.0	33.7	38.8	36.3

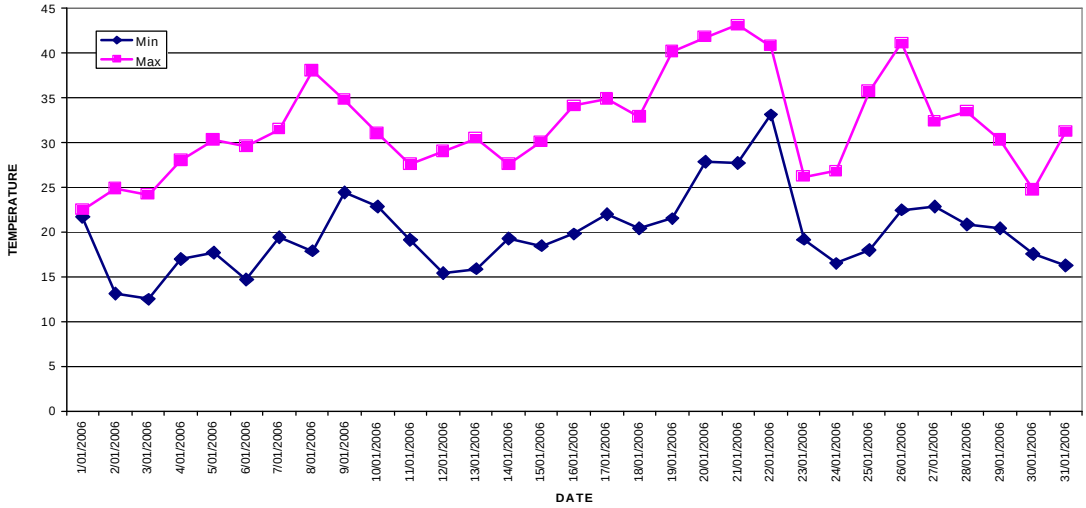
Figure 4-1 provides a trace of half-hourly air temperatures at Kent Town across the 4 days of the heatwave, while Figure 4-2 shows the daily maximum and minimum temperatures for Kent Town for the entire month of January.

Figure 4-1: Air temperature Adelaide Metro (Kent Town) 19-22 January 2006[33]



33 Temperature data provided to the Commission by the Bureau of Meteorology.

Figure 4-2: Air temperature Adelaide Metro (Kent Town) Daily for January 2006



4.1.1 Forecast Temperatures

The BoM issues a range of public weather information, including a 7-day ahead forecast. The enhanced 7-day forecast service for Adelaide was introduced by the BoM on 4 April 2006. At the time of the heatwave, the BoM was issuing 4-day ahead forecasts.

On Wednesday 18 January 2006, the day prior to the events the subject of this Inquiry, the 4-day ahead forecast was for 4 days of temperatures above 35°C. The forecast maximum and minimum daily temperatures at Kent Town were as follows:

Table 4.2: Maximum (day-time) temperature forecasts vs. observed at Kent Town over the heatwave period[34]

DAY FORECAST MADE	WED 18 JAN 06	THURS 19 JAN 06	FRI 20 JAN 06	SAT 21 JAN 06	ACTUAL (OBSERVED) TEMPERATURE
Weather day					
Thursday 19 Jan 06	37°C				40.2°C
Friday 20 Jan 06	35°C	37°C			41.8°C
Saturday 21 Jan 06	38°C	41°C	42°C		43.1°C
Sunday 22 Jan 06	39°C	39°C	39°C	41°C	40.8°C

34 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, Table 2-1.

Table 4.3: Minimum (night-time) temp forecasts vs. observed at Kent Town over the heatwave period [35]

DAY FORECAST MADE	WED 18 JAN 06	THURS 19 JAN 06	FRI 20 JAN 06	SAT 21 JAN 06	ACTUAL (OBSERVED) TEMPERATURE
Weather day					
Thursday 19 Jan 06	23°C				21.5°C
Friday 20 Jan 06	23°C	23°C			27.9°C
Saturday 21 Jan 06	20°C	23°C	26°C		27.7°C
Sunday 22 Jan 06	27°C	27°C	29°C	29°C	33.1°C

It is clear from Table 4.2 and Table 4.3 that the maximum and minimum temperatures for Kent Town during the period 19 to 22 January were underestimated to some extent. However, the BoM advises that temperature forecasts are only ever a "best estimate" and cannot be guaranteed as the true outcome. BoM verification data shows an average day-ahead forecast error for Adelaide of around +/- 3°C during the summer months with 3% of forecasts (or an average of 3 days in summer) being in error by more than +/-5°C.

The BoM's *national error target* for day-ahead forecasts is +/-3°C (maximum temperatures) and +/-2.5°C (minimum temperatures). The *actual error* (2004/05) was +/-1.6°C (maximum temperature) and +/-1.5°C (minimum temperature).

Consequently, it is clear that reliance on such BoM weather forecasts needs to consider the possibility of error in those forecasts.

4.2 The outages on the network

The highest recorded demand (2,633 MW) experienced on ETSA Utilities' distribution network occurred on Friday, 20 January 2006 and was 4% greater than the previous peak of 2,538 MW recorded in February 2001.[36]

Both the HV and LV networks were affected by the heatwave conditions during the heatwave.[37] No 66kV sub-transmission feeders were affected during the heatwave, while the 33kV sub-transmission network was affected by 5 incidents. [38]

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35 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, Table 2-2. Temperatures are minimum for the overnight period ending on the 'weather day' shown. For example, the temperatures for Saturday 21 January 2006 are those for the night period starting at dusk on Friday 20 January 2006 and ending at dawn on Saturday.

36 ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006",* page 10.

37 Nearly all (99.9%) of ETSA Utilities customers are connected to either the 11kV or low voltage (LV) network.

38 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 23.

There were two substations affected during the heatwave; one due to a relay failure and the other due to a 33kV circuit breaker failure. The last substation was restored at 9:23pm on Saturday, 21 January after a 57-minute outage. The other substation outage was restored in 73 minutes. [39]

There were 51 quality of supply enquiries and/or complaints made to ETSA Utilities by customers in relation to the heatwave, with a significant number of these relating to low voltage and lamp flicker.

Table 4.4 provides details on the number of customers affected by outages, separately according to LV and HV components of the network, and according to SA regions.

Table 4.4 – Number of customers affected by outages during the heatwave[40] (by voltage and location)

LOCATION	LV		HV		TOTAL	
	NUMBER	%	NUMBER	%	NUMBER	%
CBD	50	0.4%	0	0.0%	50	0.1%
Metro	10,607	84.1%	38,696	46.1%	49,304	51.1%
Rural	1,933	15.3%	44,614	53.1%	46,547	48.2%
Remote	26	0.2%	644	0.8%	670	0.7%
Total	12,616	100%	83,954	100%	96,571	100%

While there appears to have been a relatively even spread of HV faults across the State during the heatwave, LV issues were predominantly confined to the metropolitan Adelaide area.[41]

The peak number of customer interruptions (caused by either HV or LV network faults) was 17,954 and this occurred in the 6-hour period to midnight on Saturday, 21 January. [42]

The 84,000 customer interruptions caused by HV faults during the heatwave were the result of 103 recorded HV network incidents.[43] Thus the average number of customers affected by each HV incident was about 815.

One third of the HV feeders that experienced outages during the heatwave experienced more than one outage over the 4-day period. Just over a quarter (26.6%) of customers affected by

39 ETSA Utilities' response to the Commission's detailed Questionnaire, Question 10.6.3 (page 8).

40 Drawn from PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, Table 3-3.

41 ETSA Utilities' response to the Commission's detailed Questionnaire, Question 37 (page 29).

42 ETSA Utilities' response to the Commission's detailed Questionnaire, Question 10.3 (page 6).

43 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 23. Note that some individual customers were impacted by more than one network incident..

HV incidents over the period, were affected by faults on the 33kV network – one of five recorded incidents interrupted supplies to over 14,000 customers. [44]

Approximately 12,600 customers were affected by outages on the LV network during the heatwave, as a result of 395 recorded LV faults.[45] Thus the average number of customers affected by each LV incident was about 32.

The final tally of customers affected by outages during the heatwave (96,600) significantly exceeded ETSA Utilities' earlier advice of 63,000 affected customers as reported in the Commission's Issues Paper. [46] The Commission understands this to be partly a result of ETSA Utilities initially using a heatwave period that concluded on the Sunday morning (22 January), rather than at midnight as requested by the Commission.

4.2.1 Incidence and Duration of Outages

The time taken to restore 80% and 90% of the total HV interrupted customers, by broad distribution network area, is given in Table 4.5.

Table 4.5 – Times to restore the majority of customers affected by HV network outages during the heatwave, by region[47]

REGION	TIME TO RESTORE HV CUSTOMERS	
	80% (MINS)	90% (MINS)
CBD	-	-
Metro	120	138
Rural	89	143
Remote	208	278
Total	**120**	**143**

ETSA Utilities advised that 94% of customers who experienced an outage relating to the HV network had power restored in 3 hours, and 86% of customers who experienced outages (both HV and LV) had supply restored within 3 hours.[48]

Customers affected by outages on the LV network had the longest outage durations.[49]

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44 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 23, Balhannah substation incident, occurred at 20.26hrs on Saturday 21 January, 14,415 customers. ETSA Utilities' response to the Commission's detailed Questionnaire, Attachment 1-HV Interruptions_19-22 January 2006.xls.

45 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 24 and Table 3-6.

46 Essential Services Commission of SA, February 2006, *Essential Services Commission Act 2002 – Part 7 Inquiry: ETSA Utilities' Network Performance and Customer Response January 2006 – Issues Paper*, page 9. (http://www.escosa.sa.gov.au/webdata/resources/files/060208-HeatwaveInquiry_IssuesPaper.pdf).

47 Drawn from PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, Table 3-4.

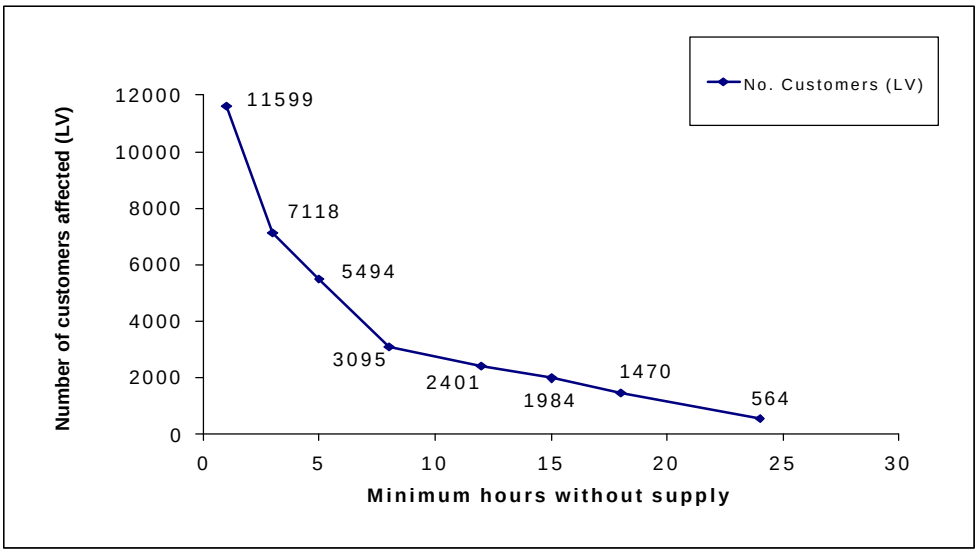
48 ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006"*, page 27.

The average time period for which customers affected by outages on the LV network were without supply was approximately 7 hours, with only 8% of those customers having supply restored in less than one hour.[50] The number of such customers without supply for minimum periods of time is shown in Figure 4-3. It is noted that:

- 564 customers were without electricity for more than 24 hours;
- 1,937 customers were without electricity for more than 12 hours but less than 24 hours; and
- 650 customers were without electricity for more than 8 hours but less than 12 hours.[51]

These final figures significantly exceed ETSA Utilities' earlier advice of approximately 1,000 customers experiencing prolonged LV supply interruptions, in excess of 12 hours, which was reported in the Issues Paper.[52] The Commission understands that this reflects the additional analysis performed by ETSA Utilities subsequent to the heatwave.

Figure 4-3 – Customer numbers affected versus (minimum) interruption time (LV)[53]



[49] PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 67.

[50] PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 24.

[51] These figures are correct as at 31 August 2006. The Commission notes that ETSA Utilities is continuing to investigate these figures and the final numbers may vary from those presented here.

[52] Essential Services Commission of SA, February 2006, *Essential Services Commission Act 2002 – Part 7 Inquiry: ETSA Utilities' Network Performance and Customer Response January 2006 – Issues Paper*, page 9.

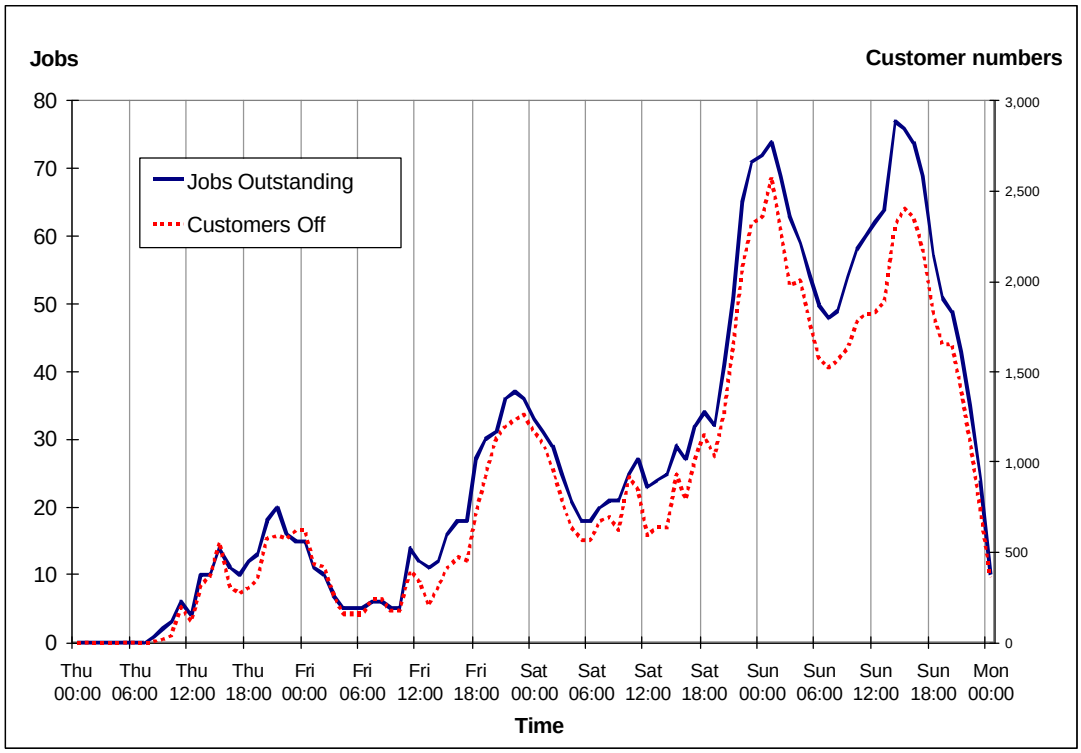
[53] PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, Figure 3-2.

The Commission reported in the Issues Paper, based on ETSA Utilities' advice, that approximately 3,300 customers were affected by LV interruptions with an average restoration time of 5½ hours.[54] That report was significantly lower than the actual final figure of 12,600 customers experiencing LV outages, with an average restoration time of 7 hours.

PB Associates determined that for almost all (98%) LV customers who were without supply for at least 24 hours, the outage period started after 1pm on Saturday 21 January. Similarly, 70% of those customers without supply for at least 12 hours were interrupted after midday on Saturday 21 January.[55]

Figure 4-4 shows the pattern of customers affected by LV outages, with the peak outages occurring in the early hours of Sunday 22 January and then again later during that day.

Figure 4-4 – Outstanding LV Jobs and customers without supply over the period[56]



54 Essential Services Commission of SA, February 2006, *Essential Services Commission Act 2002 – Part 7 Inquiry: ETSA Utilities' Network Performance and Customer Response January 2006 – Issues Paper*, page 14.

55 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 25.

56 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, Figure 4-2, drawn from ETSA Utilities response to the Commission's detailed Questionnaire, Question 1.

4.3 Putting the performance of the network in context

While the data outlined above provides insight on the immediate impacts of the heatwave on the performance of the distribution network, there are other data sets which can be utilised to provide a more contextual analysis of that performance. Of particular relevance are the data showing how the performance might impact upon ETSA Utilities' attainment of the annual reliability targets specified in the Electricity Distribution Code and the data comparing demand during the heatwave to forecasts.

4.3.1 Reliability Performance Measures

As outlined in section 3.3.1, the service standards framework set out in the Electricity Distribution Code specifies annual reliability targets for SAIDI and SAIFI which ETSA Utilities is required to meet in providing distribution services.

The ratio of SAIDI to SAIFI, referred to as Customer Average Interruption Duration Index, or "CAIDI", represents a measure of the average duration or the average length of an interruption, weighted by the number of customers affected, for customers interrupted during a specific time period.

ETSA Utilities was requested to provide values for these measures associated with the performance of the network during the heatwave. ETSA Utilities' responses are provided in Table 4.6.

Table 4.6 – Network performance measures (State-wide) for the period 19-22 January 2006[57]

PERFORMANCE INDICES	SAIDI (MINS)		SAIFI		CAIDI (MINS)	
	HV	LV	HV	LV	HV	LV
Thursday 19 Jan 06	0.75	0.57	0.01	0.003	60.9	200
Friday 20 Jan 06	2.13	1.53	0.02	0.004	90.3	393
Saturday 21 Jan 06	3.60	3.28	0.04	0.006	90.9	572
Sunday 22 Jan 06	3.44	1.39	0.04	0.004	98.4	339
TOTAL	**9.92**	**6.77**	**0.11**	**0.017**	**89.8**	**418**

From this data it can be seen that incidents on 21 January contributed the most to the heatwave period SAIDI, SAIFI and CAIDI totals.[58]

Table 4.6 indicates a total State-wide SAIDI of around 17 minutes (HV 9.9 minutes, LV 6.8 minutes) during the four days of the heatwave event. It is noted that over the five-

[57] PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, Table 3-8.

[58] PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 27. The daily SAIDI figures are for outages which started within the defined heatwave period – i.e. 00.01hrs on Thursday 19 January 2006 to 24.00hrs on Sunday 22 January 2006. Where an interruption starts on one day and is restored on another (subsequent) day, the time is attributed to the day on which the interruption started.

year period 2000/01 to 2004/5 the annual average HV SAIDI was about 161 minutes per annum.[59]

PB Associates has placed the HV network SAIDI days in context, showing that the highest daily HV network SAIDI of 3.6 minutes occurring during the heatwave (refer Table 4.6) does not rank in the top twenty HV SAIDI days for the last seven years.[60] Thus while the impact was material, it did not have the same impact on the data as have many storm events.

The Commission notes that ETSA Utilities has comparatively little experience at compiling and reporting such indices for the LV network. Until recently, ETSA Utilities has only been able to provide estimates of annual LV SAIDI and SAIFI at a State-wide level. In the Commission's 2004/05 Distribution Annual Performance Report, annual State-wide LV SAIDI was estimated, on the basis of advice from ETSA Utilities, to be around 4% of the value of the HV SAIDI index, i.e. about 6.3 minutes.[61]

This suggests that the LV SAIDI for the four-day period of the heatwave, about 7 minutes, is likely to be a very high value for this index, with about half of this amount arising from LV interruptions on 21 January. Such a large value for LV SAIDI is driven by the long duration of the LV outages, with the average response time (CAIDI) being about 420 minutes (7 hours).

4.3.2 Comparisons with Planning Forecasts of Demand

As noted previously, a new peak demand of 2,633 MW was experienced on ETSA Utilities' distribution network, on Friday, 20 January 2006. In considering the impacts of this peak load on the distribution network, it is the localised impacts which are of most relevance. In this context ETSA Utilities has advised the Commission that:[62]

- the total state peak was 92% of ETSA Utilities' forecast peak demand for 2006; noting that the 92% figure is consistent with a non-peak industrial load period (January) and 2 of the 4 hot days falling on a weekend;
- the metropolitan ElectraNet[63] connection points recorded up to 91% of 2006 forecast;
- one country ElectraNet connection point exceeded forecast (Hummocks by 5%);

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59 Essential Services Commission of SA, November 2005, *2004/05 Annual Performance Report: Performance of South Australian Energy Distributors*, page 76 (http://www.escosa.sa.gov.au/webdata/resources/files/051130-APR_EnergyDistributors.pdf).

60 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 28.

61 Essential Services Commission of SA, November 2005, *2004/05 Annual Performance Report: Performance of South Australian Energy Distributors*, page 16. ETSA Utilities provided an estimate of State-wide LV SAIDI for 2004/05 of 6.3 minutes, corresponding to an increase in State-wide SAIDI of 4% (from 164 minutes to 170 minutes).

62 Essential Services Commission of SA, February 2006, *Essential Services Commission Act 2002 – Part 7 Inquiry: ETSA Utilities' Network Performance and Customer Response January 2006 – Issues Paper*, page 10.

63 ElectraNet Pty Ltd (ANC 094 482 416), trading as ElectraNet SA, is the licensed operator of the electricity transmission network in South Australia

- three metropolitan residential zone substations just exceeded 2006 forecast (Northfield, Blackwood and Clarence Gardens by 2-4%); and
- seven country zone substations exceeded 2006 forecast (Pyap, Loveday, Goolwa, Victor Harbor, Angle Vale, Keith and Port Augusta by 2-15%).

This data permits an assessment of the adequacy of ETSA Utilities' distribution network to meet demand.

The Commission notes that, while the actual load exceeded the forecast load at some locations in South Australia, this does not mean that there was inadequate capacity available at these substations nor that there was shortage of electricity in South Australia. Most, if not all, of the heat related outages were very localised and not due to an electricity shortage.

Loads exceeded forecast demand at various locations throughout South Australia during the heatwave. Consequently, ETSA Utilities will need to revise its load forecasts, but this is something that it does each year after the peak load summer period as part of the normal planning process.

The distribution demand was about 4% higher than in the heatwave of 2001. The peak demand was significantly below ESIPC's 10% Probability of Exceedance (PoE) forecast (which is understandable given that the heatwave occurred during a holiday period) and generally below the Agreed Maximum Demand for connection points; it is noted that extreme conditions will always cause some local problems.

It may be the case that parts of the distribution system are being operated at a high utilisation level and that there is limited flexibility for ETSA Utilities to relocate load within the system. One implication of such a situation is that there would be more onus on ETSA Utilities, in seeking to provide a reliable supply to customers, to maintain the system and manage outages (including through deployment of resources and use of mobile plant) in a very efficient manner.

5 IMPACTS ON CUSTOMERS

This Chapter contains the Commission's findings in relation to the second limb of the first part of Term of Reference 3.1, i.e. the performance of the distribution network during the heatwave in the context of impacts on customers, including the number, duration and value of outages, and their customer service experience (in particular the performance of ETSA Utilities' call centre).

5.1 Evidence of impacts on customers

Throughout the course of the Inquiry, it has proven difficult for the Commission to obtain first-hand knowledge of the actual impacts of outages during the heatwave on individual customers. While there was a degree of media reporting on such impacts, there was little individual evidence available to the Commission. As a result, it is difficult for the Commission to be conclusive about actual case-by-case impacts; it is able, however, to draw general conclusions as to the overall impacts based on the data covering the nature and duration of outages described in the previous Chapter.

That said, the Commission did receive copies of a number of letters from members of the public to the Minister for Energy and ETSA Utilities as part of this Inquiry process. Further, in an effort to elicit evidence from South Australians affected by the outages, the Commission formulated a customer questionnaire to gain further insight into these issues and to enhance its understanding of customer experiences over the heatwave. That questionnaire sought details of the public's experience with:

- power outages and voltage fluctuations;[64]
- call centre responsiveness and effectiveness; and
- damages resulting from the heatwave.

The availability of the questionnaire was publicised by the Commission in the Advertiser on Tuesday 7 February 2006 and Saturday 18 February 2006, and all regional papers (Burra Broadcaster, Plains Producer, The Bunyip, The Leader, The Courier, The Southern Argus, Coastal Leader, The South Eastern Times, The Naracoorte Herald, Border Chronicle, The Border Times, The Loxton News, The Murray Pioneer and The River News) and the Messenger press (News Review, Leader, East Torrens, Eastern Courier, Hills & Valley, Southern Times, Guardian, Weekly Times, Standard, Portside, City Messenger and Northern Weekly) in the week commencing 20 February 2006.

Copies of the questionnaire were also made available through the Commission's website.

Many customers were frustrated over the length of the outages. Some customers who faced multiple outages queried why the first repair had not dealt with the problem sufficiently (e.g. a

[64] Examples of quality of supply or voltage problems include low voltage and lamp flicker.

fuse replaced on one phase, followed by a fuse needing to be replaced on another phase an hour later).

At least one customer was seeking an explanation as to how some customers in the street were still receiving power, when they were not.[65]

It is of note that the Energy Industry Ombudsman (EIO) has advised the Commission that his Office received few complaints from customers about electricity supply matters arising from the heatwave.

The customer questionnaire enabled customers to provide details on each incident and separate attempt to contact the call centre. The results of the customer questionnaire, as relating to network performance during the heatwave, are briefly summarised below.

The Commission received 18 completed questionnaires (17 from Adelaide metropolitan areas and 1 from country/rural South Australia).

Due to the small number of respondents involved, the results cannot be seen as a statistically representative sample, but provide anecdotal evidence of the impact according to the customers completing the questionnaire. Nevertheless, the first hand information provided assistance to the Commission in understanding the impact of, and experiences with, the heatwave from the point of view of those South Australians who were affected by outages.

5.2 Value of outages to customers

Independently of the information gained from members of the public, the Commission also undertook analysis of the likely value (or cost) of outages to customers arising from the heatwave.

The cost of outages to customers (that is the loss in value to the customer resulting from a sudden power interruption) varies between customer types.[66] For commercial and industrial customers, these costs may take the form of lost sales, idle plant and labour, or product and input spoilage. For residential customers, the cost of outages may also include spoilage but the less tangible costs of inconvenience and discomfort play a more dominant role.

The costs of outages are closely related to the customer's dependency on electricity. This dependency is a function of customer characteristics (customer type, activities interrupted, size of operation, season and time of day) and interruption characteristics (duration, frequency, time, notice, local or widespread and severity). Residential customer outage costs vary by customer location (geographically and rural/urban), customer appliance holdings and

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65 Note that this issue relates to power generally being supplied in three phases, while most houses are supplied with one phase, some houses with large electrical loads may require three-phase power. In a number of instances during the heatwave the transformer fuse for only one phase blew and as a consequence some houses could continue to be supplied by the relevant transformer, from the remaining phases.

66 See, for example, South Australian Independent Industry Regulator (SAIIR), June 2000, *Information Paper No.1 Electricity Tariffs and Security of Supply* (prepared for the Commission's predecessor by the SA Centre for Economic Studies) (refer http://www.escosa.sa.gov.au/webdata/resources/files/FinalReport_1_SACES.pdf).

whether or not household members are home. Industrial and commercial outage costs vary by industrial classification and the presence of backup generation.[67]

The Commission noted in the Preliminary Report to the Minister, based on advice from the Electricity Supply Industry Planning Council , that the actual loss of load during the heatwave was relatively small. At the time of system peak on 20 January only about 1MW of load was not being supplied.

Accordingly, it is not expected that there would be a large (relative) State economic impact arising from the heatwave, because the impact of extended outages was experienced by a relatively small number of residential customers.

In order to calculate the value of the heatwave outages in a refined manner it would be necessary for the Commission to calculate the interruption duration for each customer and each customer type and place a value on unserved energy ($/kWh) and unserved load ($/kW). The Commission has not attempted to do this, given the intensive nature of the data requirements.

The Commission has opted for a different approach, designed to provide a broad indication of the likely value of the outages for ETSA Utilities' customers who experienced an outage during the heatwave. This approach attempts to calculate a value of customer reliability (VCR) by applying the National Electricity Market (NEM) Value of Lost Load (VoLL) figure of $10,000/MWh to the estimated outage time faced by customers during the heatwave,[68] using an estimated average predicted load loss of 2kW/h per customer. This produces an estimate of the value of LV outages of $1.7 million and HV outages of $2.5 million, a total value of $4.2 million.

The Commission used the NEM VoLL figure to calculate a VCR, as VoLL is used in the NEM to value reliability in the assessment of transmission augmentation projects and is also the wholesale electricity market price cap. The VoLL estimate of $10,000/MWh is also broadly consistent with the VCR figure estimate of $11,867/MWh for Victorian residential electricity customers determined in a 2002 study commissioned by VENCorp.[69]

The Commission estimated an average residential consumption of electricity during the heatwave to be 2kW/h, as this figure is indicative of the average residential base load in SA. Using a residential figure is a further approximation, as it is understood that many businesses

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67 For a more detailed discussion on Estimating the Costs of Outages, see South Australian Independent Industry Regulator (SAIIR), June 2000, *Information Paper No.1 Electricity Tariffs and Security of Supply*, pages 7-17.

68 Determined from data provided by ETSA Utilities: ETSA Utilities' response to the Commission's detailed Questionnaire, Question 1, Attachment 1.2 for LV outages; and ETSA Utilities response to the Commission's detailed Questionnaire, Question 2, Attachment 2 for HV outages. A figure of 171 customer MWh of LV outages was calculated, with a figure of 251 customer MWh of HV calculated, covering the four-day heatwave period.

69 VENCorp is a Victorian State-owned Government entity and has major operational, planning and development roles for gas and electricity in Victoria's privatised energy industry. In May 2003, VENCorp released a report, "Response to Submissions: Final Report – The Value of Unserved Energy to be Used by VENCorp for Electricity Transmission Planning", which provides a summary of the findings of a study commissioned by VENCorp and completed by Charles River Associates (CRA) on the cost to electricity consumers of supply interruption, and the conversion of those cost estimates into a value of customer reliability to be expressed on a $ per MWh basis. Both the VENCorp and the CRA report are available from the VENCorp website at http://www.vencorp.com.au.

were also affected by outages in the heatwave, and using a more sophisticated analysis these businesses would be ascribed different values for outage loss and the value of such loss.

Whatever the value ascribed, the impact on those customers facing long outages was very real and a key outcome of this Inquiry is to achieve changes so that such occurrences are minimised in the future. Customers able to demonstrate loss have been, or are being, compensated by ETSA Utilities.

5.3 Call centre volumes during the heatwave

The information services supplied to the public by ETSA Utilities cover a range of areas, including call centre operations and media services.

The call centre was under considerable pressure during the heatwave, with the last three days of the four day heatwave period featuring in the top 13 daily call volumes (since October 2004), with only the peak August 2005 storm day (30 August 2005) exceeding the peak heatwave days.[70] Calls per day during the heatwave exceeded 15,000 on Saturday 21 and Sunday 22 January.

To place these call volumes into some context, ETSA Utilities has handled an average of 470,000 telephone calls per annum (approximately 1,200 per day) to all of its telephone lines for the past five years, meeting the Electricity Distribution Code standard of answering 85% of calls within 30 seconds. The 40,000 calls received solely on the faults and emergencies line during the four-day heatwave period therefore represented around 9% of the expected annual call volume to all lines.[71]

Table 5.1 – Call centre performance during the heatwave period [72]

	THURS 19 JAN	FRI 20 JAN	SAT 21 JAN	SUN 22 JAN	TOTAL
NUMBER CALLS RECEIVED	2,990	5,113	15,059	16,593	**39,755**
NUMBER CALLS ANSWERED BY IVR	1,856	2,975	8,749	10,329	**23,909**
NUMBER CALLS ANSWERED BY CALL CENTRE OPERATOR	1,051	1,647	2,337	2,175	**7,210**
PERCENTAGE OF CALLS ANSWERED WITHIN 30 SECONDS	83%	73%	63%	64%	**66%**
NUMBER OF CALLS ABANDONED	40	349	3,602	4,093	**8,084**
PERCENTAGE OF CALLS ABANDONED	1%	7%	24%	25%	**20%**
AVERAGE WAIT TIME FOR AN OPERATOR (MIN:SEC)	0:58	2:59	13:29	11:56	

70 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, Table 4-2.

71 Drawn from Electricity Industry Guideline No.1 statistical returns supplied by ETSA Utilities. Placing the 9% in context, 4 days represents just over 1% of a year (365 days).

72 Drawn from PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, Table 4-1, supplemented by additional data received from ETSA Utilities. This call data relates only to calls received on the Faults and Emergencies phone number 13 13 66. The Customer Service phone number 13 12 61 is handled by operators situated at Keswick. The number of calls on the Customer Service phone number were not material to this exercise, totalling 1,449 for the four day heatwave event, with the level of service exceeding 90% of these calls responded to within 30 seconds.

Table 5.1 summarises the call centre performance statistics for the heatwave period.

It should be noted that the data in Table 5.1 has been revised in a number of areas from that provided in a similar table contained in the Commission's Issues Paper. The most significant change addressed an issue with the call centre recording system at the time, where a number of calls were counted more than once.[73] The Commission has been advised that this problem was unique to the heatwave period and has subsequently been rectified.

The peak call volume over the heatwave was 1,665 calls between 9pm and 10pm on Saturday 21 January. The average time for calls to be answered by an operator during this peak hour was 50 minutes 42 seconds. For life threatening, emergency calls, the average wait time was 32 seconds, with the longest wait time for a safety related call being 60 seconds.[74]

In periods of high call volumes during the heatwave, the average time to answer a call via an operator was over 35 minutes.[75]

Over the four days of the heatwave 66% of calls received were answered within 30 seconds (annual standard is 85%)[76], with an average 63% of calls answered within 30 seconds for the two peak days of Saturday 21 and Sunday 22 January.[77]

ETSA Utilities was not able to provide the Commission with any information on the number of overload events, where customers simply received an engaged signal and were not able to get through to the IVR.

5.3.1 Call Centre performance – customer experiences

The Commission received a number of submissions to its Issues Paper and completed customer questionnaires.

In relation to ETSA Utilities' information management performance, the Minister for Energy raised concern in his submission with:

> *... the inability of call centre staff to provide advice or a status report of precise or estimated restoration times, despite many customers' repeated telephone inquiries....*

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73 In answers to follow-up questions from the detailed Questionnaire, March 2006 ETSA Utilities has advised the Commission that during the heatwave the call centre's IVR system was configured to continue to re-present calls from one IVR port to the next until the call was accepted by an available port. This configuration ensured the stability of the IVR during the heavy call volume periods and was not apparent to customers. Each time a call was re-presented under this configuration it was counted as a separate call in the earlier reported call statistics. The total re-presented calls for the four-day period were 10,759.

74 ETSA Utilities' response to the Commission's detailed Questionnaire, Questions 11 & 12.7 (pages 9 & 11).

75 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 49.

76 The Electricity Distribution Code (clause 1.2.2 of Part A) defines responding to telephone calls to include answering a customer's telephone call in person and answering a customer's telephone call by providing access to a computer/telephony based interactive service which is able to process calls by providing information or direct calls to a service officer, but does not include the answering of a call by being placed in an automated queue to wait for one of these options.

77 ETSA Utilities' response to the Commission's detailed Questionnaire, Question 48 (page 37).

Some general themes in comments made by customers in the customer questionnaires, included:

- long delays in talking to call centre operators;
- while the IVR included a message indicating the likely wait to talk to an operator, this generally appeared to significantly under-estimate the actual wait;
- if accurate information could have been obtained soon after the outage (e.g. on likely restoration times) then losses could have been substantially minimised, with lack of information being a major frustration;
- automated messages did not seem to reflect what was actually occurring in the field. When they did, they provided limited information that an outage was known but the likely restoration time was unknown;
- lack of confidence that ETSA Utilities is aware of the individual's problem, forcing customers to wait on the phone for long periods in order to get through to an operator; and
- inability to make a phone call, as phone required power to operate.

The inability to gain information about power outages through the IVR, or the difficulty experienced in informing ETSA Utilities of outages in their area, seemed to further exacerbate the frustration of customers during the heatwave. Ultimately this resulted in long waiting times and lengthier calls as customers vented their frustrations to operators when calls were finally answered.

6 ETSA UTILITIES' GENERAL PREPARATIONS

The second part of Term of Reference 3.1 requires the Commission to consider the adequacy of ETSA Utilities' response during the heatwave conditions experienced in South Australia from 19 to 22 January 2006.

Consideration of this matter can be separated into three issues:

- what does ETSA Utilities do in terms of overall management, planning and preparation for periods of high forecast demand and/or extreme events, including its contingency planning for extreme events?;
- what did ETSA Utilities do specifically to prepare for the forecast conditions of 19 to 22 January?; and
- what did ETSA Utilities do during the heatwave to minimise its impacts on the network and customers?

This Chapter sets out the Commission's findings in relation to the first issue and looks particularly at ETSA Utilities' general preparations for periods of high forecast demand and/or extreme events. The following two Chapters, deal with each of the remaining issues in turn.

6.1 Some observations on "general preparations"

As the Commission has already outlined, there is a complex interaction between the structure of the regulatory pricing regime, the incentives placed on ETSA Utilities' planning and management to minimise the number and duration of customer outages and the standards imposed under regulatory instruments. That interaction need not be repeated here, other than to note that ETSA Utilities' management, planning and preparation is necessarily driven by the entire regulatory environment (including Acts of Parliament and the National Electricity Rules).

There are, however, some other specific matters which are worth considering as preliminary matters when having regard to ETSA Utilities' overall management, planning and preparation processes for extreme events.

6.1.1 High demand and extreme events

The concept of high demand, being the limited periods in any given year when the amount of electricity drawn from the network is significantly higher than average, and the particular problems faced by South Australia in that regard, has also been well documented by a number of sources, including the Commission. Of note, in 2001/02 the Electricity Demand-Side Management Task Force, appointed by the SA Government, noted that:[78]

> *South Australia has the most peaky demand profile of any of the Australian States. The need to supply large quantities of electricity for very short periods of time, largely to meet summer air-*

[78] The Task Force report is available at http://www.sustainable.energy.sa.gov.au/dhtml/ss/section.php?sectID=108&tempID=62.

conditioning requirements, is leading to an unsustainable investment in peaking generation that will lead to increasingly higher energy costs for South Australian consumers.

For ETSA Utilities, the key issue in relation to high demand generally is the reduction of network supply costs, through improvements to load factor, while at the same time maintaining customer service levels.[79] This interplay is reflected within the regulatory regime discussed earlier in this Inquiry Report. The overall approach to managing this issue is, necessarily, reflected in ETSA Utilities' operations.

In previous reports the Commission has highlighted the important influence that extreme weather events can have on the annual reliability performance of ETSA Utilities.[80] As a result, in seeking to improve its annual reliability performance, ETSA Utilities needs to ensure that its processes for dealing with extreme weather events are of a high order.

There are essentially two types of extreme weather events that can influence the ETSA Utilities' network, being:

- Storm events (e.g. the storm event of late August 2005), associated with high winds and lightning, potentially causing widespread outages on the distribution network. Such events are not associated with peak electricity demands, can occur at almost any time of the year, and occur relatively frequently (2 to 5 events per annum).
- Heatwave events (e.g. the January 2006 heatwave), due to prolonged high temperatures with associated peak electricity demands caused by air-conditioning use. Widespread outages may occur, particularly at the local (LV network) level due to transformer overloading. Such events occur during the hotter summer months and are much less frequent than storm events, since heatwave conditions necessary to significantly impact on the distribution network are comparatively rare (< 1 event per annum).

6.1.2 The effect of hot weather on electricity systems

It has been noted that the impact of the physical environment on the network, and the organisational response of ETSA Utilities, are both significant factors in determining the quality and reliability of distribution services provided to customers. Distribution networks are usually planned, designed, constructed and maintained to set (prescribed) standards. Network performance will depend on the interaction of a number of variables, such as asset age, network design, system operation, maintenance policy and environmental conditions. In understanding the environmental

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79 Load factor means the ratio of average demand across the year to peak demand.

80 See, e.g. Essential Services Commission of SA, November 2005, *2004/05 Annual Performance Report: Performance of South Australian Energy Distributors"*, section 3.2.2.6, available from http://www.escosa.sa.gov.au/webdata/resources/files/051130-APR_EnergyDistributors.pdf.

conditions within which the distribution network is required to operate, regard needs to be had to aspects such as the short-term and long-term effects of weather conditions.[81]

PB Associates commented in its report on the effect of hot weather on electricity systems.[82] The ability of a specific network asset (e.g. lines, cables and transformers) to carry electrical current is defined by its rating, or current carrying capacity. All distribution network assets have a design rating which depends on a number of design and operational characteristics. Design ratings often vary from asset to asset, and according to environmental conditions of the relevant site.

The ability of distribution equipment to safely and effectively carry electrical load (current) will depend, largely, on the temperature to which the item of equipment can be safely raised during operation without causing damage (to itself or to others).

Overheating of network items can cause damage to equipment or result in over-sagging of overhead lines, due to expansion causing safety clearances to be infringed.[83]

The rating of network equipment is determined by operating temperature, which in turn is determined by the amount of electrical current the asset carries (electrical loading), and the ambient temperature.

PB Associates summarises a number of separate (but related) issues when considering the impact of hot weather on electricity distribution networks, as follows:

- the direct effect of high ambient temperatures on electrical equipment and apparatus;
- the impact of high ambient temperatures on the current carrying capacity (rating) of electrical equipment and apparatus; and
- the increased (current) loading on electrical equipment and apparatus as a consequence of increased use of air-conditioning load (i.e. an indirect impact of high ambient temperatures).

Generally, heat-related distribution network problems arise from high temperatures resulting in high demand through the increased use of air-conditioning, which can lead to overloading of network equipment such as transformers. This effect is extended during heatwave periods.

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81 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 20.

82 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 20.

83 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 20. Overhead lines are usually un-insulated and are therefore designed and constructed to operate at a safe distance from the ground, buildings and trees. Ambient temperature and current loading are important contributors to the design 'sag' of the line – both of which will increase sags and reduce safety clearances. It is these clearances which are usually the limiting factor in the rating of overhead lines.

PB Associates noted that:

> *high ambient temperatures alone are unlikely to have an adverse affect on the network assets – although hot weather will give rise to a lower current carrying capacity (lower rating) and hence serve to exacerbate any network loading difficulties caused by increased use of air-conditioning equipment. The time for which conductors operate in high ambient temperatures may also impact on the current carrying capacity of the equipment.*[84]

Highly loaded lines can give rise to excessive voltage drop. Whilst this may be considered a secondary effect (depending on the extent of the problem), it is still a problem for those customers affected.

Finally, PB Associates observed that:

> *All of these characteristics are well known to distribution businesses, including ETSA Utilities, and the systems are designed and constructed to account for such temperature effects.*[85]

6.1.3 Outage Management System

One very useful tool for the management of extreme events, which was not fully functional and therefore not integrated within ETSA Utilities' processes at the time of the heatwave, is an Outage Management System (OMS).

During 2002/03, the Commission undertook a review of the method by which ETSA Utilities derived its reliability performance measures (SAIDI and SAIFI). The review identified weaknesses in the way in which data relating to high voltage electricity outages had historically been captured (noting that no information was collected on low voltage outages). This led to some changes to reliability performance standards at that time, in particular to the standards applicable to rural areas.

During the course of the review, the Commission concluded that there was a need for ETSA Utilities to establish a direct link between customers and the distribution transformers which supply them. This would remove the uncertainty associated with the existing process of estimating the number of customers affected by particular outages on the distribution system.

In March 2003, ETSA Utilities advised the Commission that it considered the best method of creating this link was to implement an Outage Management System similar to the systems utilised by the electricity distribution businesses in Victoria. As well as significantly improving the accuracy of reliability performance reporting, such an OMS would enable ETSA Utilities to administer the GSL scheme introduced as part of the EDPD from 1 July 2005. The GSL scheme requires a direct customer/transformer linkage to permit appropriate payments to be made to eligible customers.

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84 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 21. Electrical equipment, which has been operating in high ambient temperatures for many hours before being heavily loaded is likely to be less capable of dealing with the increase in load than one which has been subject to high temperatures for a much shorter time period beforehand. Several days of high (day and night) temperatures do not allow for equipment to cool as effectively.

85 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 22.

In its application for a pass-through to distribution tariffs of the costs of the OMS, initially submitted to the Commission in August 2003, ETSA Utilities set out the system functionality required.[86] Under the heading of Data Management/ Recording, the functionality included recording supply restoration progress to individual customer level for planned and unplanned supply interruptions including:

- Receipt of job request;
- Time of arrival at trouble call site;
- Estimated time to restore supply;
- Time supply restored; and
- Details of trouble call (e.g. failure mode).

ETSA Utilities noted that this functionality would also allow customers to be provided with more accurate and detailed information on supply restoration times.

An integral part of the functionality involved the installation of mobile computing for field crews. This was necessary to facilitate the handling of a significantly increased volume of data associated with about 40,000 events per year (all LV and HV interruptions) compared to the 3,800 HV only events. In addition, the system was required to incorporate crew management capabilities including crew availability, skill levels, vehicle type and associated plant and equipment availability.

The OMS pass-through application was approved by the Commission in December 2003. Since that time, ETSA Utilities has been progressively implementing the OMS and has previously advised the Commission that full functionality is expected to be available by December 2006.

Based on the functionality outlined above, the implementation of the OMS by end 2006 should play a central role in improvements to the process for identifying, sorting and dispatching LV network faults after that time, with the potential to have a major impact on customer service outcomes by substantially reducing the time involved in identifying the type and location of system faults. Consequently, the OMS should support the proposed centralised approach for fault handling and assist in the timely advice of restoration times on the IVR.

The Commission expects that, when this system is complete, ETSA Utilities will extract fully operational maximum value from this significant investment, enabling improved customer-network connectivity. It will be vital to the usefulness of the OMS that a rigid policy is adopted within ETSA Utilities for ensuring that the OMS data is maintained and fully reflects any subsequent modifications made to the network in a timely manner.

It is critical that the OMS be fully operational by the end of 2006.

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[86] Letter from ETSA Utilities to the Essential Services Commission of SA, dated 1 August 2003.

6.2 General Network planning

ETSA Utilities is responsible for planning the distribution system so that it complies with its regulatory obligations. These obligations include preparing the distribution system to cope with expected peak demands for electricity. These peak demands occur in summer in South Australia.

There are two distinct elements to overall network planning in the South Australian context, HV network planning and LV network planning.

6.2.1 High voltage network planning

The network planning methodology used by ETSA Utilities to "size" the HV network for peak demand conditions is based on:

- previous peak demand (last peak demand of 2,538 MW prior to the heatwave occurred in February 2001);
- historic growth rates for individual zone substations; and
- known large customer demand for electricity (i.e. by monitoring those customers requiring loads in excess of 1MW).[87]

This forecast is then modified to account for economic factors, appliance saturation and pricing signals.[88]

In addition, ETSA Utilities prepares an annual Strategic Reliability Improvement Plan, which specifies an annual reliability improvement capital works program. The current Plan details 193 reliability improvement projects aimed at improving the reliability performance of 153 substations and lines. Improvement initiatives and strategies within the plan are chosen to:

- reduce overall State/Regional SAIDI;
- improve reliability performance to the worst served customers (which impacts SI Scheme performance); and
- minimise the number of customers who experience services which would require GSL payments.[89]

ETSA Utilities publishes an Electricity System Development Plan (ESDP) by 30 June each year, in accordance with the Commission's Electricity Industry Guideline 12

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87 ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006",* page 10.

88 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 59.

89 ETSA Utilities' response to the Commission's detailed Questionnaire, Question 35 (page 28). ETSA Utilities has advised that there are 14 HV feeders that experienced interruptions during the heatwave period and have reliability improvements planned for 2006.

"Demand Management for Electricity Distribution Networks". The ESDP, available on ETSA Utilities' website [90], provides:

- a general overview of the entire distribution network;
- a description of the basis for formulating load forecasts;
- system planning and reliability guidelines;
- a description of ETSA Utilities' state-wide sub-transmission (66 kV) network;
- 13 regional development plans;
- five years of historical and forecast data for each zone substation and sub-transmission lines, including a description of possible network constraints which are likely to occur in the next 3 years.

Publication of such information is intended to facilitate the consideration by interested parties of demand management options to relieve network constraints. The Commission has recently initiated a review of Guideline 12.[91]

6.2.2 Low voltage network planning

The LV distribution network must continually be expanded and upgraded to take account of both growth in new customer connections due to new land divisions and new commercial businesses, and growth in demand from existing customers. Load growth from existing customers is mainly due to customers installing new appliances (such as air-conditioners).

Planning of new residential land divisions

ETSA Utilities has advised that it designs its network in most new residential land divisions using a demand per customer of between 6 and 8kVA depending on the type of housing proposed (e.g. normally based on size of dwellings).[92] In some land divisions incorporating larger houses, the 'design after diversity maximum demand' (ADMD) exceeds 8 kVA.[93]

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90 Available from www.etsautilities.com.au/content_page_without_related_downloads.jsp?xcid=356.

91 See the Review of Electricity Industry Guideline No. 12 page on the Commission's website at http://www.escosa.sa.gov.au/site/page.cfm?u=4&c=1891.

92 ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006",* page 10.

93 The 'After Diversity Maximum Demand' (ADMD) refers to the maximum demand for an area after considering the diversification of peak loads which occur at different times (ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006",* page 1(Glossary)). It reflects the differences in loads when customers are actually using their electrical equipment/appliances, and takes into account factors such as not all residents are likely to be at home and using all available appliances at the same time. The closer such an assessment is made to individual customers, the less diversified the demand.

Air-conditioning demand

Planning for the LV network is made difficult by the proliferation of high demand domestic appliances, particularly air-conditioners.

Current methods of tracking the growth in penetration of such appliances and hence identifying parts of the LV network that are close to their maximum capacity, include local monitoring of demand at the transformer level and a requirement for consumers to advise ETSA Utilities about the installation of any appliance with a demand > 2.5kW.[94] The Commission understands that the latter method is not working, with few customers complying with the requirement.

One of the formal submissions received by the Commission in response to the Issues Paper, from Dr P. Hornsby, focused on energy-inefficient dwellings requiring large air-conditioners to make them liveable.[95]

Dr Hornsby argued that it is difficult to hold ETSA Utilities solely responsible for the heatwave failures when demand is continuing to increase, placing increasing demands on the network. Local councils should either be required to enforce energy efficiency in all new buildings or else buildings should be mandated to be fitted with the means for solar electricity generation to mitigate excess power demands. Also advocated was a greater financial incentive for owners to install solar energy panels.

Upgrading of existing LV transformers

To meet increased demand from existing customers, ETSA Utilities has advised that it uses the following three methodologies for upgrading existing LV transformers and LV networks:

- proactive testing of about 400 transformers per year based on knowledge of the local areas (e.g. areas where ETSA Utilities identifies growth (i.e. residential development or "in fill" is taking place));
- load and voltage testing of transformer areas as a result of customer enquiries/complaints; and
- investigating LV fuse operations (such as fuses 'blowing').[96]

ETSA Utilities also advised that it uses the following three basic solutions where it has identified some potential, or actual, LV problems:

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94 See Clause 16.1(f) of Part B of the Electricity Distribution Code.

95 Dr Peter E Hornsby, 1 March 2006, Submission to January 2006 Heatwave Inquiry (letter to Essential Services Commission of SA).

96 ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006",* page 11.

- balancing the load on an individual transformer (e.g. where only one phase could be potentially overloaded but the transformer capacity is adequate) and/or increasing LV fuse sizes;
- balancing the load between transformers (by decreasing the number of customers supplied by one transformer and increasing the numbers of customers supplied by an adjacent transformer); or
- increasing the capacity of the transformer or installing an additional transformer and reducing the number of customers supplied by adjacent transformers.[97]

Redundancy in the LV system

PB Associates noted that most of the problems experienced by ETSA Utilities' customers during the heatwave were due to problems occurring in the metropolitan component of the LV network. Most of the faults occurred on the older overhead networks.[98] PB Associates put the view that much of this network has limited capacity for interconnectivity with adjacent transformers, limiting the ability for customers to be supplied from alternative (nearby) sources.[99]

PB Associates' advice is that this lack of redundancy is not unusual on older overhead networks. The newer LV networks are likely to have a higher level of redundancy through larger cross-section conductors, and LV (underground) cable systems tend to have good inter-connectivity (redundancy) in order to address longer potential outage times during repairs and maintenance.[100]

Whilst it might be expected that 'back-feeding' could be performed quicker than replacing a faulty transformer, it would still likely need crews with similar skills, and as indicated later in this Inquiry Report, the lack of crews was a key cause of the long outages experienced during the heatwave.

ETSA Utilities has advised the Commission that it is reviewing its LV distribution planning techniques and approach for overhead systems, including the amount of spare capacity available for growth, unbalanced loads and incident flexibility.[101]

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97 ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006",* page 11.

98 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 44. Refer to Chapter 7 of this Report for a discussion of the LV network problems experienced during the heatwave.

99 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 44. The level of inter-connectivity with nearby transformers dictates the extent to which transformers can be 'back-fed' during outages – both forced and planned. This interconnectivity (effectively) represents the level of capacity redundancy in the LV network.

100 The repair and maintenance of ground mounted transformers, and related equipment, usually takes longer than that for smaller, pole-mounted, transformers.

101 ETSA Utilities also notes (email to the Essential Services Commission of SA dated 5 April 2006) that optimising transformer capacity will inherently leave limited scope for load transfer during conditions of high demand and incidents

6.3 Network planning for extreme events during summer

As noted previously, there are two main types of extreme weather events: storm events and heatwave events.

The Commission notes that while the physical mechanism leading to the loss of supply during a storm event may differ from those during a heatwave, the organisational challenges are likely to be similar. Resource management is critical – ensuring the right people, equipment and resources are in the right place at the right time.

The Commission has not examined the detail of ETSA Utilities' network preparedness for storm events in this Inquiry, but notes that attention to matters such as the installation of appropriate protection devices, ensuring robustness of network elements to strong winds and adequate vegetation clearances are important aspects of the physical preparation of the network for storm events.

The preparation by ETSA Utilities of its electricity distribution network for heatwave events during summertime, and the likely co-incident peak demand on the distribution system, is examined in detail below.

ETSA Utilities has advised that it undertakes pre-season readiness checks to prepare for a summer period. The specific strategies undertaken in preparation for the 2005/06 summer period included:[102]

- 527 pole and ground mounted transformers were identified as requiring remediation prior to the 2005/06 summer. These were monitored and appropriate corrective action identified for each.
- Corrective actions were undertaken to ensure capability of handling the expected summer peak load, including:
  - upgrading LV fuses;
  - balancing loads; and
  - transformer replacement program (as at the commencement of the heatwave, 189 of the 237 transformers targeted for replacement by the end of February 2006 had been replaced).
- Locations for 2005/06 summer proactive testing program identified.

Table 6.1 provides an overview of the transformers that have been tested in areas where there has been recognised growth on the LV network or where there have been quality of supply problems identified over the last 5 years.

[102] ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006",* page 14.

Table 6.1: Transformers Tested and Installed[103]

YEAR	TRANSFORMER MONITORED PROACTIVELY	TRANSFORMER MONITORED FOR CUSTOMER PROJECTS	TRANSFORMER MONITORED FOR QUALITY OF SUPPLY	TRANSFORMERS INSTALLED FOR QUALITY OF SUPPLY	CUMULATIVE TOTAL OF TRANSFORMERS INSTALLED
2001	n/a	n/a	n/a	474 (Heat fix) 151	625
2002	n/a	n/a	n/a	150	775
2003	n/a	n/a	n/a	141	916
2004	392	186	772	152	1,068
2005	455	152	532	180	1,248
2006 (to March)	43	46	144	56	1,304

6.4 Organisational planning for extreme events

In addition to the physical planning and preparation of the network, organisational planning and preparation is a key factor in determining the quality and reliability of the distribution service experienced by customers, through actions such as ensuring adequate crews and supplies are available to cope with any significant outages associated with extreme weather events.

The operations of the Customer Information Service, in particular the call centre, is also a key element of any organisational response.

6.4.1 Emergency Procedures

ETSA Utilities has developed an 'Emergency Procedures Manual' detailing the policies, procedures and responsibilities associated with its response to declared emergencies.[104] The ETSA Utilities Emergency Procedures Manual mainly deals with the following incident types:

- State emergency;
- network emergency;
- environmental incidents; and
- network business continuity plan.[105]

The Emergency Procedures Manual identifies the steps to take in the event of an emergency, such as a forecast major storm or heatwave.

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[103] ETSA Utilities' response to the Commission's detailed Questionnaire, Question 33 (page 25).

[104] Provided by ETSA Utilities as part of its response to the Commission's detailed Questionnaire. The ETSA Utilities Emergency Procedures manual provides a framework for a wide variety of emergency situations – including environmental pollution and other incidents or situations, which may disrupt normal business operation.

[105] The network business continuity plan focuses on network operations, communication and management of critical information (PB Associates Report, page 29).

The section of the Emergency Procedures Manual dealing with the response to a network emergency is the most relevant to an extreme weather event. This section of the manual provides the following:

- definitions of emergency response levels;
- definitions and specification of individual roles and responsibilities for network emergencies;
- a description of the conditions under which a network emergency is declared (and also declared to have ceased);
- investigation and reporting requirements; and
- restoration plans (including restoration prioritisation).[106]

ETSA Utilities has advised that the processes contained in the Emergency Procedures Manual at the time of the heatwave were intended to allow for a rapid escalation of its response capability for:

> *Rectifying network faults to reinstate supply under the following prioritisation:*
>
> - *First - Respond to and making safe any network components that pose a danger to life or property*
> - *Second - Restore high voltage outages, reinstating power to large numbers of customers, and*
> - *Third - Restore supply to customers affected by LV outages, i.e. small numbers of customers (less than 60 customers per outage);*
>
> *Configuring the network (i.e. how customers are supplied) to reduce the impact faults may have on the environment in the event of a serious bushfire; or*
>
> *Mobilising resources within the ambit of the State Emergency Organisation for the conduct of counter-emergency and post-emergency operations under the Emergency Management Act of SA.*[107]

ETSA Utilities' Emergency Procedures Manual employs a system of emergency response levels, as follows:

- Emergency Response Level 0 (ERL0): Business as usual, no actions required.
- Emergency Response Level 1 (ERL1): This level is to alert key operational personnel of the events which have the potential to escalate to a higher emergency response level. ERL1 status is declared, following discussion with key staff.
- Emergency Response Level 2 (ERL2): This level is declared for a single event having significant impact on ETSA Utilities[108] or if there are (a) multiple outages over two regions; and (b) the number of tasks exceeds the capacity of the

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106 ETSA Utilities' Emergency Procedures Manual, Section 2.2.

107 ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006",* page 13.

108 The Emergency Procedures Manual provides examples of this as a failure of ETSA Utilities plant or equipment leading to a fatality, or fire damage in a remote location requiring the deployment of multiple crews and large quantities of materials.

available field response personnel to restore supplies within the regulatory targets. The duration of an ERL2 event is not expected to exceed 24 hours.[109]

- Emergency Response Level 3 (ERL3): This is the highest emergency response level, and it aims to place the organisation at the highest level of alert and emergency preparedness. An ERL3 is issued when: (a) there are numerous outages over more than two regions simultaneously; and (b) the number of tasks exceeds the capacity of the available field response personnel to restore supplies within the regulatory targets; and (c) the duration of the emergency is expected to exceed 24 hours.[110]

In addition to the Emergency Procedures Manual, ETSA Utilities also uses memos and internal letters to communicate operational policy and guidance.[111]

6.4.2 Summer Preparations

ETSA Utilities has advised the Commission that it reviews the previous summer season and previews the upcoming summer season on an annual basis and that a "Preparation for Summer" exercise forms the catalyst for improving processes and procedures. According to ETSA Utilities, the heatwave indicated that this continuous improvement process had been successful in areas such as ensuring adequate emergency stock holdings were available, appropriate work procedures were in place and operational staff preparedness was appropriate for the event.[112]

The Commission made specific inquiry into ETSA Utilities' summer preparation processes:

> *Was there a documented company policy/process in place for dealing with extreme weather events prior to 19 January 2006? Was this procedure designed for extreme hot weather? Please provide a copy of any relevant documentation.*[113]

In responding to this question, ETSA Utilities advised that: its Emergency Procedures Manual sets out the relevant and appropriate policy and processes for dealing with heatwave events; instructions on heatwave procedures for 2005/06 had been circulated to all operational managers and supervisors in December 2005; and that it had conducted its 2005/06 Summer Preparations Meeting in January (6 January 2006).[114] In relation to this last point, ETSA Utilities further advised that the Summer

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109 ETSA Utilities' Emergency Procedures Manual, section 2.2.2. In its Emergency Procedures Manual, ETSA Utilities provide examples of an ERL2 as being load shedding, single day heatwave outages and single day storms.

110 The Emergency Procedures Manual provides examples of an ERL3 as being system black start, heatwave outages exceeding two days, storms lasting more than two days and State Emergency declarations.

111 For example, in December 2005 ETSA Utilities issued an internal instruction titled "Procedures for Heatwave and Storm conditions 2005-06".

112 ETSA Utilities' response to the Commission's detailed Questionnaire, Question 40 (page 30).

113 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, Appendix B, page 78, question 6.

114 ETSA Utilities' response to the Commission's detailed Questionnaire, Question 7 (page 3).

Preparations Meeting is an annual preparedness event that is carried out by Networks, Construction and Maintenance Services (CaMS), Customer Relations, and other relevant areas of the business, which reviews the organisation's pre-summer preparations.[115]

In May 2006, ETSA Utilities subsequently advised that, contrary to its earlier advice, the Summer Preparations Meeting was but one of a series of meetings held as part of its overall summer preparations. It noted that the Board had been made aware of summer preparations matters as early as September 2005, with internal meetings held on 24 October 2005, 22 and 25 November 2005 and 1 December 2005. ETSA Utilities also noted that the purpose of the January meeting was to review matters, not to establish them.

PB Associates was satisfied with ETSA Utilities' documented processes and procedures:[116]

> *ETSA Utilities has in place, and had in place ahead of the heatwave event, fully documented processes and procedures aimed at steering the organisation through a major extreme weather - or other emergency- event.*

In December 2005 the Manager Powerline Services (within the CaMS business), sent an internal memo to all operations managers, contract supervisors, duty officers and work coordinators, setting out the procedures and preparatory measures for heatwave and storm conditions for summer 2005/06.[117] The memo sets out steps that should be taken by these officers in the event of a notification by the Network Operations Centre (NOC) or the BoM of extreme weather conditions. These steps included the following:

- placement of additional personnel on paid availability;
- checking that vehicles are fuelled and stocked;
- confirming availability of fuses, transformers and other materials stored in the depot;
- identifying planned work that can be rescheduled; and
- preparing a staffing roster in anticipation of extended severe conditions.

ETSA Utilities has advised that the following approach is adopted in the identification or declaration of an "extreme weather event" and/or implementation of extreme weather procedures, and was employed during the heatwave. The key stages of the response to an extreme weather event are:[118]

- receipt of initial forecast;

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115 ETSA Utilities' response to the Commission's detailed Questionnaire, Question 6 (page 2).

116 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 29.

117 ETSA Utilities' response to the Commission's detailed Questionnaire, Question 6, Attachment 6.2. CaMS departmental memo, dated 12 December 2005.

118 ETSA Utilities' response to the Commission's detailed Questionnaire, Question 10.4 (page 7).

- assessment of required response level;
- alerting required operational personnel of the ERL/FDL forecast;[119]
- calling of meeting to prepare ERL/FDL Action Plan;
- preparation of ERL/FDL Plan;
- execution and monitoring of the Plan;
- declaration of the end of the ERL/FDL event.

In determining adequate crew levels, consideration needs to be had to OH&S requirements, and the general welfare of crews working in very arduous conditions. The OH&S instruction for working hours requires that no employee should work more than 16 hours in any 24-hour period. Crews need to be "stood-down" after 16 hours, or earlier if fatigued, with stand-down time typically 8 to 10 hours to allow employees time to recuperate. However, employees can request longer breaks if they require more rest. Therefore, additional personnel are required to be rostered to cover periods of stand-down.[120]

6.5 Conclusions

The Commission recognises that a range of measures were implemented by ETSA Utilities prior to the summer of 2005/06, to ensure that the distribution network was adequately prepared for summer weather conditions. It included transformer upgrades, fuse upgrades and load balancing in areas of potential concern, and ensuring that adequate resources (e.g. transformer and LV fuse spares) were available.

ETSA Utilities has put the view that it is proactive in the planning for extreme events, in particular weather related events that may impact on the quality and reliability of supply in the distribution system, and that it specifically plans for extreme weather events such as heatwaves. ETSA Utilities has advised that such plans are based on experiences of past events and are implemented when forecasts suggest the likelihood of a future event requires action.[121]

The question that the Commission must address is whether those preparations were adequate in relation to the heatwave.

Having regard to these matters, ETSA Utilities argued that:

- *The preparation of the High Voltage network for peak load conditions worked extremely well with no overload of Connection Points, Zone-Substations, Sub-transmission lines or HV feeders during the heatwave thereby significantly reducing the numbers of customers affected by the extreme weather.*

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119 ERL refers to Emergency Response Level as discussed earlier in this Report, with FDL (Fire Danger Level) relating to a fire alert that also employs levels of 0, 1, 2 and 3.

120 ETSA Utilities' response to the Commission's detailed Questionnaire, Question 25 (page 18).

121 ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006",* page 13.

- *The work completed on more than 500 LV transformers during the lead up to the 2005/06 summer reduced the number of LV fuse operations compared to previous peak loads.*[122]

The Commission accepts these points. Despite this, there is sufficient evidence in the matters set out in this Chapter to cause the Commission to make the following conclusions as to the adequacy of ETSA Utilities' general preparations for extreme weather events. In doing so, the Commission concludes that in general, ETSA Utilities' general management, planning and overall preparation for the heatwave was adequate.

6.5.1 Failure to complete transformer upgrades

It was the Commission's initial understanding, based on all of its researches and material provided to it by ETSA Utilities prior to the release of the Draft Inquiry Report, that certain transformers targeted for replacement/upgrading as part of a pre-season transformer upgrade program were not replaced or upgraded. The Commission therefore concluded that such work should be completed prior to summer and, in any event, should be completed prior to times of likely peak demand (ie, during January and February).

Since the release of the Draft Inquiry Report, ETSA Utilities has provided further information to the Commission arguing that although only 187 of the 237 targeted transformers had been *upgraded* prior to summer, nevertheless all 237 transformers had been *prepared* for summer peak demand conditions. That *preparation* involved balancing the phases of the transformers to ensure that each transformer's capability would not be exceeded during the summer. The evidence presented by ETSA Utilities demonstrates that the preparation work was successful.

While this information was presented to the Commission only after the publication of the Draft Inquiry Report, and was not evidenced in any of the materials provided by ETSA Utilities in response to direct questioning prior to that time, the Commission nevertheless accepts that the process of identification for upgrade, as opposed to summer preparation, relates to a longer-term project based on demand growth over a longer period.

Notwithstanding that this information only came to the Commission's attention late in the Inquiry process, the Commission has no reason to doubt its veracity. It therefore concludes, on the basis of that information, that ETSA Utilities' LV transformer summer preparation program is adequate.

That said, it remains the Commission's view that any future summer preparations program, whatever form it may take, should be completed by ETSA Utilities prior to the commencement of summer and, in any event, prior to likely periods of peak summer demand. This conclusion would also apply to any pre-summer transformer *upgrade* program that ETSA Utilities might undertake in the future.

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[122] ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006",* page 27.

6.5.2 The "Riverbanks Estate" experience

ETSA Utilities has asserted that it designs its network in most new residential subdivisions using a customer demand of 6-8kVA. However, customers in "Riverbanks Estate" (at Flinders Park[123]) experienced three lengthy outages during the heatwave period. Each of those outages appears to have been directly related to the lack of capacity of the transformer that was installed when the estate was developed in 2002.

In responding to this matter, ETSA Utilities has advised that the experience of the "Riverbanks Estate" related to a failure in its organisational processes in that instance rather than pointing to any overall systemic planning or design issues in relation to sub-divisions.

In particular, ETSA Utilities has advised that it installed a transformer of lesser capacity at an early stage of the sub-development (when there were few residents) as a temporary measure and then simply failed to provide the appropriately sized transformer at a later date.

The Commission was concerned that this matter might have pointed to a systemic issue within ETSA Utilities, but has been presented with no evidence to suggest that this might be the case. It has therefore satisfied itself that the "Riverbanks Estate" experience was a one-off event.

However, the Commission considers that it is important for ETSA Utilities to ensure that the ADMD value used for planning purposes remains appropriate.

6.5.3 Air-conditioners

To assist its LV network planning, it is crucial that ETSA Utilities gains access to reliable information on increased network loads, particularly relating to high-powered air-conditioning units. The Commission considers that a useful approach to ETSA Utilities gaining access to this information is through the Certificates of Compliance issued by electricians to consumers following electrical work undertaken in the consumer's premises.

As a result of discussions initiated by the Commission following the heatwave involving the South Australian Technical Regulator[124] and ETSA Utilities, the Technical Regulator has agreed to change the Certificate of Compliance form to ensure that a network copy is forwarded to ETSA Utilities when the electrical equipment being installed has a capacity of 2.5kW or more (i.e. air-conditioning units).

This process is now in place and is considered a positive step, as it provides ETSA Utilities with additional information for LV network and heatwave planning.

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123 Commission received approval to treat a copy of a complaint letter to ETSA Utilities on this matter as a submission to this Inquiry. While the matter was ultimately satisfactorily resolved for these residents, the issues faced by these residents during the heatwave raises concern as to some aspects of ETSA Utilities' planning.

124 Refers to the person holding the office of Technical Regulator established under Part 2 of the Electricity Act.

6.5.4 Network Planning Issues

An event such as the heatwave underscores the need for the network and operational planning and development approaches used by ETSA Utilities to take account of South Australia's unique demand profile, the penetration of domestic air-conditioning and to have regard to the range of network planning methods used elsewhere.

As indicated in this Inquiry Report, in general, the distribution network performed well, including a comparison of actual with planning forecasts of demand.

An Inquiry Term of Reference required the Commission to determine if the practices of ETSA Utilities in relation to upgrades of LV transformers are adequate. In general, the Commission considers this to be the case, having regard to action undertaken by ETSA to test and upgrade transformers and the relatively low number of transformers that experienced faults during the heatwave.

However, as indicated above, the Commission considers that, whatever form it might take or work it might involve, a summer, or pre-peak demand, preparation program should be completed prior to 31 December each year.

The Commission notes that 14 HV feeders which experienced interruptions during the heatwave are now to be the focus of reliability improvements in 2006.

In summary, the Commission concludes that while ETSA Utilities' general management, planning and overall preparation for extreme weather events are considered to be adequate based on the information available to the Commission, nevertheless, there is scope for improvement in these areas.

6.6 Recommendations

Commission's Recommendations: ETSA Utilities' General Preparations

The Commission recommends that ETSA Utilities should have regard to at least the following matters in its on-going reviews of processes:

- ***Monitoring 'good practice' developments in network planning, in particular to ensure that its planning basis adequately takes account of very hot weather conditions.***
- ***Ensuring that the low voltage network load information that it now gains from receiving copies of Certificates of Compliance forms, particularly in relation to the installation or upgrades of air-conditioning units, is appropriately used in network planning.***
- ***Ensuring that the After Diversity Maximum Demand value used in the planning of new subdivisions is adequate for the expected current demand and reasonable future growth.***

- ***Allocating necessary resources to ensure that its pre-summer preparatory work, including necessary low voltage transformer upgrades, is completed prior to 31 December each year, ahead of likely times of peak demand.***
- ***Completing and fully implementing the planned outage management system (OMS) and network connectivity model by the end of calendar year 2006, and subsequently ensuring that the quality of the required data is maintained to ensure that maximum value is extracted from this significant investment.***

7 PREPARATION FOR THE HEATWAVE

This Chapter sets out the Commission's findings (for the purposes of the second limb of the second part of Term of Reference 3.1) in relation to ETSA Utilities' preparations for the forecast conditions of 19 to 22 January. The Chapter includes consideration of matters such as staffing, spares and equipment, including contingency arrangements.

7.1 Specific preparations for the heatwave

ETSA Utilities has advised the Commission that the procedures and processes outlined in the Emergency Procedures Manual and the Construction and Maintenance Services (CaMS) instruction "Procedures for Heatwave and Storm Conditions 2005-06" were implemented for the heatwave. Specifically, meetings were held on Thursday, 19 January and Friday, 20 January in preparation for ERL2 conditions on the weekend.[125]

In accordance with the Emergency Response Manual and the December 2005 summer preparations internal memo, ETSA Utilities' preparations for the heatwave included:[126]

- placing additional personnel on paid availability;
- confirmation of the availability of fuses, transformers and other materials stored in the depot, including the pre-placement of transformers;
- identification of planned work that could be rescheduled; and
- checking that vehicles were fuelled and stocked.

These actions are considered in greater detail immediately below.

7.1.1 Availability of field staff

One of the key issues associated with the heatwave was ETSA Utilities' inability to satisfactorily address the outstanding LV outages over the period from the evening of 21 January through to midday on 22 January, due to a lack of repair crews.

ETSA Utilities has advised that, in accordance with the Emergency Response Manual, it initiated the staff availability procedures to double the emergency response crews in metropolitan Adelaide areas and ensure that additional crews in country areas were available to deal with the forecast hot conditions.[127]

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125 ETSA Utilities' response to the Commission's detailed Questionnaire, Question 7 (page 2). Refer to Chapter 5 for a discussion of the Emergency Response Manual, CaMS instruction and the circumstances leading to the declaration of an ERL2 event.

126 ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006",* page 14.

127 ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006",* page 14.

Management decisions to place personnel on paid availability duty during heatwave conditions are based on the BoM four day forecasts, with ETSA Utilities suggesting that its initial response was based on the original forecast.[128]

During the week leading up to the heatwave, ETSA Utilities called for additional field crews and field supervisory personnel to volunteer for paid after-hours availability on Saturday 21 and Sunday 22 January. ETSA Utilities has also advised that the standard availability roster provides sufficient resources for typical out of hours supply restoration activities.[129]

ETSA Utilities has advised that, generally 6 metropolitan powerline crews are available under the standard roster and 8 powerline crews in each of Country North and Country South regions. When storm or heatwave conditions are anticipated ETSA Utilities seeks sufficient additional crews to make up a further 6 crews in the metropolitan area and an additional 4 crews in each of Country North and Country South regions.[130]

ETSA Utilities had some difficulty in getting sufficient line and trades staff to return to work over the heatwave weekend. This may have been due to factors such as a large amount of overtime having been worked up to the Christmas break for the "summer ready" program, ageing workforce and the working conditions as a result of the heatwave.[131]

On Thursday 18 and Friday 19 January, having regard to the forecast for extended heatwave conditions over the weekend, supervisors again sought additional personnel to volunteer for paid availability duty over the weekend, being from Project personnel (as distinct from Supply Restoration personnel, e.g. dealing with new capital works or upgrades) and contractors (i.e. seeking access to employees of contractors for them to handle supply restoration tasks). Little positive response was received to this further call, noting that by that time those additional personnel were contacted they had probably already made alternative arrangements for the weekend.[132]

Sufficient staff willing to work unscheduled hours were found to participate in the heatwave weekend roster (21 and 22 January) for country areas, but below requirements in metropolitan areas. However, it was still anticipated by ETSA Utilities that any shortfall encountered over the weekend could be handled by calling in off-duty personnel, as had been normal practice.[133]

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128 ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006",* page 20.

129 ETSA Utilities' response to the Commission's detailed Questionnaire, Question 7 (page 2).

130 ETSA Utilities' response to the Commission's detailed Questionnaire, Question 7 (page 2).

131 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 48. ETSA Utilities' CEO made a decision around midday on the Sunday (22 January) to offer a cash incentive to address the labour resource issues.

132 ETSA Utilities' response to the Commission's detailed Questionnaire, Question 7 (page 3).

133 ETSA Utilities' response to the Commission's detailed Questionnaire, Question 7 (page 3).

7.1.2 Availability of plant and stores

ETSA Utilities has advised that, as part of the heatwave preparations, depots were checked to ensure that they were fully stocked with fuses, transformers and other materials following the Summer Preparations 2005/06 meeting on 6 January. Stores Supply Officers were also placed on after hour's availability to enable the delivery of materials from the central store to depots as required by field crews, and as occurred during the heatwave.[134]

PB Associates considered this matter and concluded that restoration times were not affected by plant and stores availability. There were only a small number of transformers (27) that required replacement over the period, and replacement fuse elements were in adequate supply, both in the field vehicles as well as in the depot.[135]

Prior to the heatwave, a number of replacement distribution transformers were delivered from the central store to certain metropolitan depots, which was designed to reduce restoration times for transformer replacement jobs.[136]

7.1.3 Identification of planned work that could be rescheduled

ETSA Utilities has advised that any works that could be delayed were rescheduled, to release additional crews for restoration work.[137] Examples of this on Friday 20 January included:[138]

- planned work at St Mary's project depot was cancelled and 4 powerline crews were redeployed for the entire day to supply restoration activities;
- three powerline crews from St Mary's depot and two powerline crews from Elizabeth Depot were "stood down" (with pay) from approximately midday, to enable personnel to rest and be available for work later that evening.

7.1.4 Checking that vehicles were fuelled and stocked

ETSA Utilities advised that, following normal practice, emergency response vehicles were checked and fully stocked in preparation for the heatwave.[139] As indicated above, depots were restocked with fuses from the central store during the heatwave period.

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134 ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006",* page 15.

135 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 48.

136 ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006",* page 15.

137 ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006",* page 15.

138 ETSA Utilities' response to the Commission's detailed Questionnaire, Question 7 (page 4).

139 ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006",* page 14.

There were no fuel or stock shortages of any significance encountered during the heatwave.[140] However, due to the large number of fuse failures over this period, some fault restoration vehicles exhausted their supply of fuses and were required to return to the depot to restock. This resulted in additional short delays in restoration for some customers.[141]

7.2 ETSA Utilities' views on the adequacy of its planning for the heatwave

ETSA Utilities is of the view that its preparations for the forecast heatwave were sufficient, consistent with its Emergency Response Manual and appropriate for SA summer heatwave conditions.

ETSA Utilities argued that its:

> *... preparations would have been different (in nature and extent) if the forecast had predicted 3 consecutive days of greater than 40ºC and the high night time temperatures.*[142]

As indicated in the previous section, ETSA Utilities had difficulty sourcing adequate linesmen for the heatwave weekend. Too great a reliance was placed on personnel being willing to work unscheduled hours. Although this approach had worked in the past, it did not achieve the level of response required for the heatwave.[143]

ETSA Utilities stated that:

> *Whilst it is not expected that actual observations will always agree with forecasts due to the inherent complexities of their determination, [the BoM] forecasts are the only source of guidance available to ETSA Utilities upon which to base preparations for heatwave conditions.*

ETSA Utilities also submitted that it had prepared for hot weather (temperatures in excess of 35°C) as opposed to heatwave conditions (temperatures in excess of 40°C), and after two days of extreme hot weather (in excess of 40°C), preparations were escalated to deal with the unexpected high temperatures.

Moreover, ETSA Utilities put the view that receiving temperature forecasts that were substantially below those finally observed delayed it seeking additional resources to respond to the heatwave and, accordingly, its preparations were based on a lower impact event, using the best available data.

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140 ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006",* page 27.

141 ETSA Utilities' response to the Commission's detailed Questionnaire, Question 7 (page 3). Although the Commission accepts ETSA Utilities' advice that only short delays were involved, it would be expected that such delays could be further reduced (if not avoided completely) were other non-skilled staff available to resupply crews in the field.

142 ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006",* page 15.

143 ETSA Utilities' response to the Commission's detailed Questionnaire, Question 17 (page 14).

Finally, ETSA Utilities considers that the forecasting of lower overnight minima than were actually experienced amplified the impact on the network.[144]

Since the heatwave, ETSA Utilities has analysed its metering data for 19 transformer areas across metropolitan Adelaide to examine the residential load (minus Controlled Load Profile) for approximately 200 customers across the State.[145] Table 7.1 compares average load at the minimum overnight temperature for Kent Town of 33.1°C (on the night of Saturday 21 January) with the average load at the minimum overnight temperature of 27.7°C (on the night of Friday 20 January). It is asserted that this data shows that the average load overnight (from 7.00pm – 7.00am) increased by more than 16% due to the 5°C increase in minimum overnight temperature.

Table 7.1 - ETSA Utilities Load & Fault Data from January 20 to January 21 (7.00pm - 7.00am)

MINIMUM OVERNIGHT TEMPERATURE AT KENT TOWN	19 RESIDENTIAL TRANSFORMERS (AVERAGE LOAD IN KW)	CONTROLLED LOAD PROFILE METERS (AVERAGE LOAD IN KW)	NO. OF FAULTS RECEIVED (HV & LV)
27.7°C	770	187	47
33.1°C	893	222	99
INCREASE FOR 5°C RISE	**16%**	**19%**	**111%**

ETSA Utilities argued that this data demonstrates a material impact of the higher than forecast minimum overnight temperature on its network assets, and its ability to respond to reported faults.

ETSA Utilities argued that, based on the temperature forecasts, it would have had sufficient resources to complete the outstanding work, and retain the capacity to handle the number of new failures. Due to the temperature forecasts being substantially below those actually observed, however, the process of seeking additional resources to respond to the heatwave was delayed.

It is ETSA Utilities' position that BoM weather forecasts provide the basis for making appropriate preparations for an event such as the January 2006 heatwave. ETSA Utilities does not believe it is possible (or desirable) to 'second guess' the BoM forecasts, which would cause it to underestimate in some circumstances, and overestimate in others.

7.3 Specific response to ETSA Utilities' submissions on weather forecast error

ETSA Utilities has placed significant reliance on what it has identified as errors made by the BoM in under-forecasting temperatures for the period of the heatwave. This is a claim which the Commission does not accept and, as such, is one which requires some detailed analysis.

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144 ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006",* page 16.

145 ETSA Utilities' email to the Essential Services Commission of SA, dated 5 April 2006.

The Commission agrees that weather forecasts are very important in the preparation for any extreme weather event, and notes the emphasis ETSA Utilities has placed on forecast errors and its assertion that it planned for a lesser event.

Of course, forecasts of weather patterns and temperatures are by nature somewhat uncertain. An inaccuracy in projected temperatures and conditions is not unusual. In the view of PB Associates:

> *... it may not have been unreasonable to have expected ETSA Utilities to have anticipated errors in the temperatures forecast by BoM and taken the appropriate measures [to address that risk] – especially as these errors fell within the BoM performance targets on critical days of the heatwave (Saturday and Sunday).*

Further, PB Associates stated that it was:

> *... unaware of any explicit measures taken by ETSA Utilities to risk-manage, or otherwise mitigate the impact of, inaccurate forecasts on its business (predominantly, its organisational response).*[146]

The Commission has had regard to the information provided by ETSA Utilities and also to commentary of, and analysis undertaken by, PB Associates, which included an assessment of the use and value of the weather information available to ETSA Utilities. In addition, given the key role that the weather forecasts play in the preparation for any extreme weather event, the Commission has had discussions with the BoM.

7.3.1 Bureau of Meteorology advice

The BoM has advised the Commission that heatwaves are not "predicted" on an ex ante basis, rather they are observed to have occurred on an ex-post basis.[147] The BoM does not predict heatwaves as part of its public weather forecasting service, nor does it envisage doing so in the near future.

Nevertheless, the BoM does believe that consultation between ETSA Utilities and a Bureau Duty Forecaster could have added value in regard to forecasting the possible range of expected temperatures – including information on the probability of exceeding specific thresholds on any day during a specified period.

The BoM provides a 24-hour weather forecast service from its Forecasting Centre in Kent Town, with a trained meteorologist always available for consultation. The general public, industry and others with concerns about the weather utilise this service. The Duty Forecaster can discuss the possible range of expected temperatures including the probability of exceeding specific thresholds (maxima or minima) on any day.

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146 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 41.

147 Letter from Bureau of Meteorology to the Essential Services Commission of SA, dated 5 April 2006.

The BoM has also observed to the Commission that:

- the BoM is unaware of the 'Emergency Response Level' (ERL) system used by ETSA Utilities, nor is it an integrated partner in that system;
- consultation between ETSA Utilities and the BoM duty forecaster would have been useful during the period 19 – 22 January and the preceding days, particularly in relation to the probability of the temperature (maxima or minima) exceeding specific thresholds;
- ETSA Utilities may benefit from adopting the 72, 96 or 120-hour 'rolling forecast temperature' in its preparations for hot weather conditions;
- a range of 'tailored' services could also be negotiated by ETSA Utilities through the BoM's Special Services Unit to include forecast data in a variety of formats (including enhanced information on temperature, severe weather (including strong winds), thunderstorms and lightning);
- a version of a tailored service had been provided by the BoM to ETSA Utilities for several years; however, this service ceased in July 2005 with ETSA Utilities not seeking to negotiate new arrangements;
- 'Power Utilities Fire Danger Level (FDL) Advice' is the only BoM product designed specifically for ETSA Utilities at present. All other products used by ETSA Utilities are provided for public consumption with ETSA Utilities deriving benefit from their general availability; and
- an example of a tailored service is that provided to the State Emergency Service (SES) which needs to be able to assess whether to put volunteers on notice for attendance late on a Friday or over a weekend. The service provided to the SES has been specified as the result of extensive negotiations between the BoM and the SES.

7.3.2 Quality of information

Weather information (general weather forecasts) and warnings (storms and fire danger level) were used by ETSA Utilities in the days prior to and during the heatwave.

The Commission notes that while in almost all cases the actual maximum daily temperature was higher than that forecast at the day-ahead stage by the BoM, nevertheless, the BoM forecast very hot temperatures; and very hot temperatures were experienced. By early afternoon on Friday 20 January, and taking into account the BoM's forecasts for 21 and 22 January, it was clear that South Australia was experiencing a severe heatwave.

Further, the Commission notes that the BoM one day-ahead forecast temperatures do at times, vary from observed temperatures. The BoM provides a large amount of public data relating to the accuracy of weather forecasts. It is therefore not unreasonable to expect that ETSA Utilities would have taken into account the

possibility of errors in the 4 day-ahead and one day-ahead forecasts in its analysis of the weather forecasts used for heatwave preparations.

PB Associates' assessment is that there was a reasonable amount of weather information available to ETSA Utilities to assist the organisation to prepare for the heatwave.[148]

PB Associates assessed the data provided by ETSA Utilities (as outlined in Table 7.1 above) and has advised the Commission that it considers it unlikely that the increase in the number of faults experienced on the Saturday (i.e. 99, compared to 47 on Friday) is directly attributable to the rise in night-time temperatures [149] – regard must be had to the effects of successive hot days. Thus, the under-forecast by the BoM of the overnight Saturday minimum temperature should not have been critical to ETSA Utilities' management of the situation.

On the evidence available to the Commission this is the case even if the higher overnight temperature on the Saturday night caused unexpectedly higher levels of demand – it was clear that by this stage of the heatwave ETSA Utilities was having difficulties in responding, as recognised by it calling ERL 2 on the Saturday morning.

7.4 Conclusions

There is no doubt that the weather forecast for 19 to 22 January 2006 was for very hot weather and that very hot weather eventuated. Indeed, by midday on 20 January, given the forecast of 42°C and 39°C for 21 and 22 January respectively (refer Table 4-2) it was clear that a very significant heatwave was underway.

Apart from its approach to assessing weather forecast information and risk assessment in general, and the staff availability processes in the Emergency Procedures Manual, it appears to the Commission, having had regard to all of the matters set out in this Chapter, that other areas of preparatory work undertaken by ETSA Utilities specifically for the heatwave were generally satisfactory.

In relation to ETSA Utilities' approach to assessing weather forecast information and risk assessment in general, for reasons set out below the Commission has reached the conclusion that ETSA Utilities should adopt a more sophisticated, proactive approach to the interpretation and organisational response to weather forecasts in preparation for extreme weather events.

7.4.1 Reasons for conclusions on weather forecast information

Importantly, while the Commission is not convinced that the under-forecasting by the BoM of the overnight minima on 21 and 22 January was so critical to the extent of

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148 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 38.

149 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 40.

problems that developed, given that ETSA Utilities is of the belief that it was critical, then the failure of ETSA Utilities to consider the possibility of under-forecasting indicates an omission in its planning for the heatwave.

The Commission considers that ETSA Utilities had sufficient weather information available to enable it to prepare for the weather conditions, although the Commission is also of the view that there is other information which would have enhanced ETSA Utilities' response.

ETSA Utilities has asserted that it made preparations for "hot weather" temperatures above 35°C as opposed to heatwave conditions.[150] The Commission notes that Adelaide experienced a prolonged period of hot weather in January 2006 (refer Figure 4.2), evidenced by:

- Wednesday 18 January the BoM was forecasting temperatures 4 days-ahead above 35°C;
- 10 of the 14 days prior to the heatwave had maximum temperatures greater than 30°C (for Adelaide);
- the average maximum during this 14 day period was 31.5°C; and
- the maxima on 16 to 18 January were 34.1°C, 34.9°C and 32.9°C respectively.

The Commission notes that since the BoM does not predict heatwaves per se, heatwaves are only evidenced in hindsight and therefore the Commission considers it would be appropriate for ETSA Utilities to develop its own internal definition of extreme weather events for which it should be alert and responsive.

ETSA Utilities has provided data (see Table 7.1) showing an increase of 16% in overnight demand from Friday 20 to Saturday 21 January. It has asserted that, based on analysis it has undertaken, this increase in demand was due to the increase in overnight temperature, as its conclusion is that the overnight residential load on transformers is 80-90% dependent on overnight temperature, with 10% dependent upon the preceding day-time temperature.

The Commission acknowledges the empirical findings put forward by ETSA Utilities but does not resile from its general position that the overnight load on 21 January would likely have been higher than that on 20 January even if the forecast overnight minimum temperature had not been exceeded, due to the prolonged high day-time temperatures over the preceding period.

The information provided by ETSA Utilities, and information provided to the Commission by the BoM, indicates that:

[150] ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006",* page 16.

- ETSA Utilities does not have a commercial relationship with the BoM for specific, tailored weather forecasting service;
- the specific service previously provided to ETSA Utilities ceased in July 2005; and
- ETSA Utilities appears to place extensive reliance on the general publicly available 4.00pm the day ahead forecast for planning purposes and appears to assume that such a forecast will translate into the actual observed temperature.

While ETSA Utilities has advised that it is the Manager Asset Performance who has the responsibility for monitoring the public up-dates to BoM data, it is not clear to the Commission as to how those up-dates (if received) were (or are generally) factored into ETSA Utilities' response to the heatwave.

In addition, as noted earlier in this Inquiry Report, it is clear that reliance on such BoM weather forecasts needs to consider the possibility of error in those forecasts.

In responding to the Draft Inquiry Report, ETSA Utilities challenged the Commission's position on this issue, arguing that while it recognises the potential for error in weather forecasts, the process of factoring in such errors can be complex and cause incorrect responses.[151] ETSA Utilities suggested that what the Commission was positing was that ETSA Utilities ought to have overestimated the forecast temperatures (that is, presumed for upwards error) yet at the same time underestimated the fire danger level for country areas forecast by the BoM (that is, presumed downwards error).

This is not the Commission's contention. What the Commission has contended, and maintains, is that notwithstanding the actual errors (whether upwards or downwards) that eventuated in relation to either forecast, there was sufficient notice of the likely conditions of prolonged extreme temperatures such that ETSA Utilities could have had appropriate staffing levels available if it had better integration of forecast data into its processes.

While ETSA Utilities has rejected the Commission's conclusions in this area, the Commission does not resile from them, for a number of reasons. These reasons are largely set out above. In addition, however, the Commission notes that, despite the time which has elapsed since the heatwave in January, ETSA Utilities has not presented any material outlining the manner in which weather forecasts are integrated into its extreme weather event planning processes.

7.5 Recommendations

The Commission recommends that ETSA Utilities should implement a more sophisticated approach in relation to the interpretation of weather forecasts in its preparation for extreme events.

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151 ETSA Utilities, July 2006, *Submission to Heatwave – Draft Inquiry Report*, page 4.

In suggesting a risk management approach to the weather forecasts, the Commission is not suggesting that ETSA Utilities "second guess" the BoM, but rather that ETSA Utilities could and should actively engage with the BoM in relation to the weather forecasts on a regular, proactive basis prior to and during prolonged hot weather (and in relation to other extreme weather events).

In the Commission's view it was not appropriate for ETSA Utilities to simply rely on the general and publicly available 4 day-ahead (now 7 day-ahead) forecasts and the 4.00pm day before weather forecasts and to assume that, for planning purposes, these forecasts would translate into actual observed temperatures. It should engage much more actively with the BoM during extreme weather events. In addition, because the primary risk to the distribution network arises from peak demand, ETSA Utilities should develop models which take account of the impacts of prolonged periods of hot weather on residential properties and the probable impact of such weather on the use of air conditioners.

To meet the particular need to have staff on call, it would be appropriate for ETSA Utilities to develop its own definition of extreme weather events (heat and storm) to suit its own business model and to pursue commercial forecasting arrangements to assist it in managing on-call staff and in the prediction of the likely severity of an event.

Commission's Recommendations: Preparations for the Heatwave

The Commission recommends that ETSA Utilities should adopt a more sophisticated, proactive approach to the interpretation of, and organisational response to, weather forecasts in preparation for extreme weather events. Such an approach would, in the Commission's view, require ETSA Utilities to consider at least the following matters:

- ***The development of an internal definition of extreme weather events for which ETSA Utilities should be alert and responsive.***
- ***The incorporation of appropriate error margins into weather forecasts used for extreme weather event planning purposes.***
- ***The feasibility of adopting commercial weather forecasting arrangements to provide better and more meaningful data to assist in planning for extreme weather events.***
- ***Active engagement with the Bureau of Meteorology's Duty Forecaster on a regular basis during extreme events.***

8 RESPONSE DURING THE HEATWAVE

As required by the final aspect of the second part of Term of Reference 3.1, this Chapter sets out the Commission's findings in relation to ETSA Utilities' organisational response to the outages caused by the heatwave during the period 19 to 22 January.

8.1 Response to the heatwave

This section outlines ETSA Utilities' organisational response during the heatwave, with the primary focus being on its organisational response to outages on the LV network.

8.1.1 Issuing of ERL2

ETSA Utilities' Incident Coordinator (IC) declared an ERL2 event on the morning of Saturday 21 January, with key operational managers directed to meet as the Emergency Response Group (ERG) at 10.30am. The rising number of customer calls concerning outages, the reassessment of the weather and the continued reduction in field staff availability triggered the declaration of ERL2.[152] As is common in electricity distribution businesses, the person managing the control room activity (NOC), and the person in control of the resources, took on key roles in the management of the emergency event.

8.1.2 Outstanding LV jobs and Crewing Levels

Figure 8-1 shows the level of LV network jobs outstanding over the heatwave, together with new and completed jobs. As can be seen, the issuing of ERL2 coincided with the beginning of the period when outstanding LV jobs began to escalate.

Throughout the Saturday, new jobs continued to emerge at a faster rate than jobs were completed, with the result that there was a steady rise in the number of uncompleted tasks. PB Associates observed that:

> *A notable increase in the number of new LV jobs is observed to have occurred over the period from 6pm on Saturday (21 January) through to midnight. This is reflected in a sharp increase in the number of outstanding jobs over the same period. The number of outstanding LV jobs is seen to grow from around 35 on Saturday at 6pm to approximately 75 six hours later (midnight).*
>
> *This increase in the number of LV jobs outstanding resulted in a corresponding sharp increase in the number of customers without supply ..., The ETSA Utilities fault report records show that the number of customers without supply due to LV outages by 6pm on Saturday was 1,148. By 1am on the Sunday morning this number had risen to approximately 2,500.*[153] [154]

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[152] ETSA Utilities' response to the Commission's detailed Questionnaire, Question 14 (page 13). The ERG is an additional management oversight team that coordinates all operational activities in responding to an emergency event. The NOC and Field Operations continue to function as normal with the ERG in operation. See section 5.5.1 for discussion of the basis for calling ERL2.

[153] PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 36.

Figure 8-1: LV jobs: new, completed and outstanding, over the heatwave period[155]

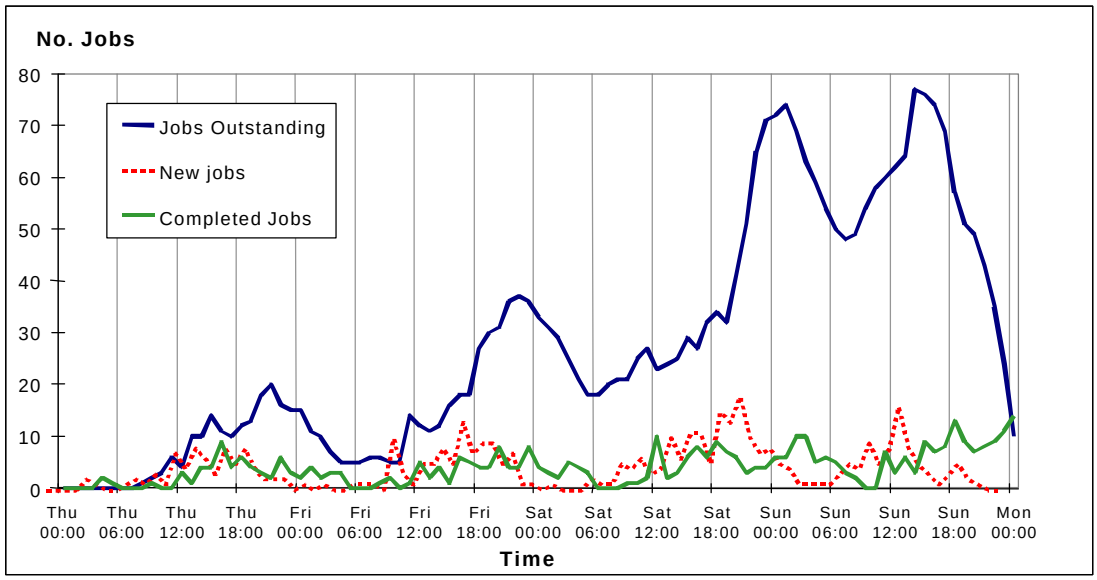
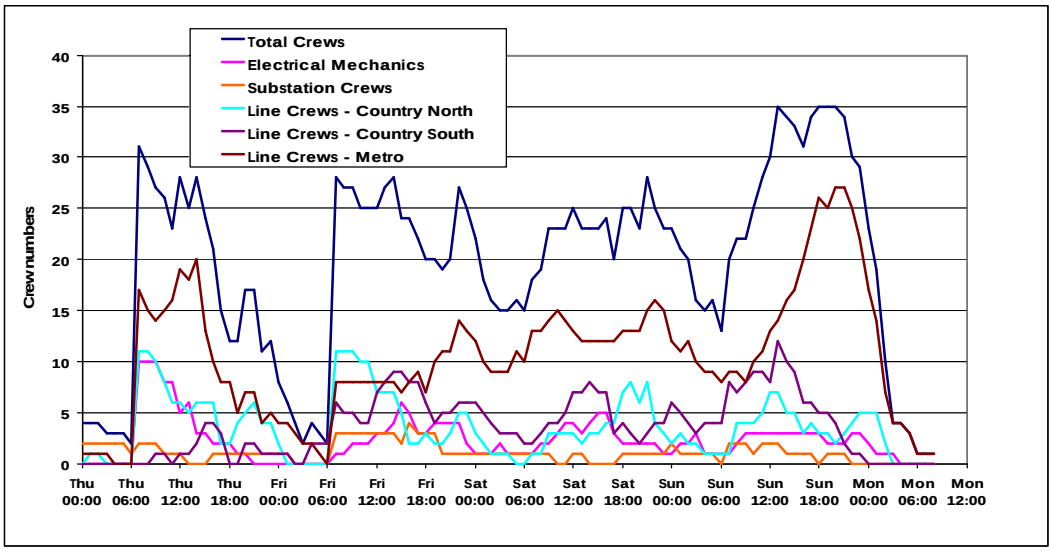


Figure 8-2 shows the number of ETSA Utilities' crews working during the heatwave.

Figure 8-2: Number of ETSA Utilities crews working over heatwave weekend[156]



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154 Refer to Figure 4-4 for a plot of customers without supply on the LV network during the heatwave.

155 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, Figure 4-1, drawn from ETSA Utilities' response to the Commission's detailed Questionnaire, Question 1.

156 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, Figure 4-3.

As indicated by comparing the large number of outstanding jobs during late Saturday 21 January and early Sunday 22 January in Figure 8-1 with the number of field crews available over this period from Figure 8-2, crews needed to be stood down, having worked very long hours in arduous conditions, at the very time outstanding jobs had hit their peak. Thus there was a clear crew resourcing issue affecting the ability for ETSA Utilities to address the number of outstanding LV jobs during this period.

PB Associates noted that the inability to obtain sufficient crews appears to be one of the major contributing factors to the proliferation of the long duration LV outages over the Saturday night and early Sunday morning, with a convergence of staff stand-downs and an increasing number of LV fuse operations.[157]

ETSA Utilities attempted to employ a number of crewing strategies over the heatwave weekend, including:[158]

- St Mary's depot (Metropolitan South) was staffed 'around the clock' from approximately 3.00pm on the Friday (20 January) with a supervisor and team leader to manage the growing volumes of work. Around the clock staffing commenced at the Holden Hill Depot (Metropolitan North) from around midnight on the Friday;
- rostering of supervisory personnel at the depots and the rotation of available crews to handle the extended nature of the event;
- stand-down of crews occurred in accordance with the relevant OH&S standards;
- during the heatwave there were at least two HV Switching personnel continuously on duty and four Dispatch personnel in the NOC. Listed volunteer officers were also called in to manage the IVR. As a result, the normal number of 3 - 4 personnel was increased to 7 - 8 at the height of the event;
- during the Saturday and Sunday (21 and 22 January 2006), the ERG decided against redeploying a significant number of crews from country regions to the metropolitan area, due to the existing forecast high fire risk;
- office staff were called in to assist and carried out the following activities:
  - listed volunteers were called in to manage the IVR (normally managed by the Dispatchers);
  - assisted St Mary's and Holden Hill depots with collating, resolving and prioritising jobs and in general to manage the flow of dispatched jobs, dispatch work to crews, manage crew levels and report status information to the NOC; and

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157 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, Page 48.

158 This advice has been drawn from a number of areas of the ETSA Utilities' response to the Commission's detailed Questionnaire, as follows (in the order of the dot points): Question 7 (page 4), Question 7 (page 4), Question 19 (page 15), Question 20 (page 16), Question 26 (page 19), Question 27 (page 19), Question 28 (page 20), Question 29 (page 20) and Question 29 (page 20).

- investigated low voltage fuse operations and identified transformers where the fuses had operated more than once, and any serious loading problems (office based activity);[159]

- did not release any ETSA Utilities employees to assist sister company Powercor in Victoria, which was also experiencing difficulties at the time of the heatwave;[160]
- by the Saturday morning (21 January) all staff on "Weekly Rostered" and "2nd Call" paid availability duty had been called to work. An attempt had been made to contact all staff on the "Willing Workers List"; and
- the process of contacting all appropriately skilled employees continued late into the Saturday night (21 January) with very limited success, recommencing early on the Sunday morning (22 January) again with limited success.

Thus one of the key issues contributing to the long LV outage duration was that ETSA Utilities did not have the crews available to satisfactorily address the outstanding LV outages over the period from Saturday evening through to Sunday midday (21 and 22 January 2006).

ETSA Utilities had some difficulty in getting sufficient line and trades staff to return to work over the heatwave weekend. The number of staff indicating a willingness to do overtime was small and the normal telephone 'ring-around' during the weekend did not secure many volunteers.

It was apparent early on the Sunday morning (by 9 to 10 am, 22 January) that there were an unacceptable number of customers that had been without supply for long periods. The matter was escalated to senior ETSA Utilities management and to the CEO. At around midday that day, ETSA Utilities offered a cash incentive to staff in an attempt to address the crewing issues. [161]

By Sunday evening there were approximately 35 crews involved in the restoration process (see Figure 8-2). Furthermore, the number of LV jobs and the number of customers without supply started to decrease rapidly after around 6pm on Sunday evening (see Figure 8-1).

8.1.3 Management and Tracking of LV network faults

The lack of feedback on outstanding restoration times appears to be one of the central factors that prevented ETSA Utilities from responding adequately to the level of outstanding LV outage jobs and providing reliable information to customers.

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159 Office based personnel were not directly involved in field activities as the vast majority of field activities required a trade or related qualification, eg. working with live electricity, HV & LV switching, repairs to fixed wiring, working at heights, testing and re-connection of customers premises, etc. ETSA Utilities' response to the Commission's detailed Questionnaire, Question 27 (page 19).

160 ETSA Utilities also advises that during the heatwave there were also no transfers in place. ETSA Utilities' response to the Commission's detailed Questionnaire, Question 28 (page 20).

161 ETSA Utilities' response to the Commission's detailed Questionnaire, Question 29 (page 20).

It would be expected that, had ETSA Utilities management had access to reliable LV job restoration time information, it would have recognised much earlier (on the Saturday afternoon) that the situation was getting out of control. Hence, rather than have the organisation respond to a crisis management meeting on the Sunday morning, action could have occurred on the Saturday afternoon when it was most needed to be taken.

Under normal conditions the NOC dispatches restoration jobs directly to field crews, primarily via pagers but also via mobile phone and two way radio contact. These field crews determine the required rectification works and undertake any required operations on the system. This is all carried out under the direction of the centrally located system controller.[162]

The procedures that applied at the time of the heatwave required that in emergency or avalanche conditions, as occurred during the heatwave, customer call fault information would be relayed directly to the depots. At the depots, attempts are then made to organise the individual calls into potential jobs, usually through a combination of a local street directory and the geographic information system (GIS), depending on skills of staff at the depots.[163] As evidenced by the heatwave experience, this process is often difficult and time consuming. In many instances there are numerous calls received for each outage, which need to be collated and grouped.

This process made it difficult for central control to monitor the overall situation, and in particular the number of jobs outstanding at any particular point in time, the total number of customers affected, and individual job restoration times. It was therefore difficult to provide useful restoration information to individual customers, which inevitably increased customers' frustration and dissatisfaction with the restoration efforts.

8.2 ETSA Utilities' analysis of its organisational performance during the heatwave

ETSA Utilities has acknowledged that it is unacceptable for significant numbers of customers to experience long delays in having their electricity restored during extreme events, particularly in metropolitan areas.[164] For example, the restoration prioritisation procedures operating at the time of the heatwave did not escalate the priority of small numbers of customers who potentially could be without supply for long periods or experience multiple interruptions.[165]

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[162] PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 44.

[163] GIS can be used to identify common LV circuits and hence assist with the appropriate grouping of calls.

[164] ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006",* page 28.

[165] ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006",* page 5.

As a consequence, ETSA Utilities has indicated an intention to implement a number of measures designed to reduce the risk of such a result occurring again during an extreme event:

> *With the resources available to it and given the level of performance that it has achieved over the longer term, ETSA Utilities has met the standards required. However, ETSA Utilities is committed to using the lessons learnt from the January Heatwave to ensure that the number of its customers that experience [an] unacceptable level of customer service in respect of future like events is minimised.*[166]

ETSA Utilities considers that it could have performed better by:

- increasing the awareness of forecast ERL conditions across a wider section of staff, particularly across field crews;
- having better arrangements and incentives for securing "off duty" staff prior to the event, and also for calling-in "off duty" staff as the heatwave progressed;
- improving procedures for sorting, managing and dispatching fault calls in depots and for reporting status information to the NOC; and
- having improved procedures for management escalation of lengthy LV outages.[167]

ETSA Utilities has advised that the following improvement measures have been implemented since the heatwave:

- development of a Major Incident Availability Allowance (incentive payment) for field and depot based staff to maximise the number likely to make themselves available out of hours under such circumstances in the future. Whilst some specific details are still subject to consultation, ETSA Utilities has advised the Commission that it is in a position to apply the allowance were a Major Incident to occur in the future;
- procedures to determine staffing level "quotas" for emergency conditions;
- wider dissemination of "Emergency Response Level" Procedures to all relevant operational personnel;
- issuing of ETSA Utilities-wide alerts to forewarn relevant staff of forecast emergency conditions, eg. pager messages, two way radio announcements. On receipt of forecast or actual ERL or FDL events via pager or SMS message, operational response personnel are required to contact their line manager for further direction, because the line manager is responsible for organising their part of the total ERL or FDL operational response;
- implementation of a Maximum Restoration Time Policy; and
- improved procedures for listing all staff contact details on the IntraNet and improved procedures for calling in "off duty" staff.[168]

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166 ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006",* page 4.

167 ETSA Utilities' response to the Commission's detailed Questionnaire, Question 43.2 (page 35).

168 ETSA Utilities' response to the Commission's detailed Questionnaire, Question 45 (page 36), updated with advice from ETSA Utilities in email dated 19 April 2006.

ETSA Utilities has also advised of further actions it either intends to, or has already implemented, as follows:

- development with the NOC of improved management reports for monitoring work backlogs and overall status of emergency events;
- including new information on the NOC Intranet site, such as a number of reports to monitor the status of dispatched work; with these reports being further refined as a result of a 5 April 2006 ERL trial and were expected to be available by 5 May 2006;
- when an ERL or FDL event is forecast or is actually happening, staff will assemble as part of the Emergency Response Group (ERG), to monitor the progress of outages and alert the ERG to outages getting close to threshold limits;
- further specific training of key CaMS personnel about crisis and emergency management;
- training of key CaMS personnel was undertaken as part of the ERL trial of 5 April 2006 and ETSA Utilities expects that ERL trials will be conducted annually;
- further improvements to processes for calling in staff during emergency conditions, eg. improved personnel lists available on the IntraNet;
- performance of annual simulated trials of ERL conditions across the entire restoration process flow, ie. Call Centre to NOC to Field Response.[169]

In the light of its experiences during the heatwave, ETSA Utilities has decided that for future events, responsibility for identifying network faults will not be devolved to the depots. ETSA Utilities proposes to centralise the fault call grouping function (i.e. packaging into jobs for dispatch) to maximise the numbers of field crews available to restore supply to customers.[170] Depots will focus on managing resources, to enable the NOC to retain overall control of the LV fault situation.

ETSA Utilities has also advised that there will be an improved prioritisation system for dealing with long LV outages:

> *A revised prioritisation system has been implemented to escalate response solutions for small numbers of customers who potentially could be without supply for more than 10 hours or experienced multiple outages during a single event.*[171]

Notwithstanding the identified negatives, ETSA Utilities considered that during the heatwave it performed well in areas such as:

- field personnel continued to work long hours in very hot conditions;
- there were no materials shortages of any significance;

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169 ETSA Utilities' response to the Commission's detailed Questionnaire, Question 46 (page 36), updated with advice from ETSA Utilities in email dated 19 April 2006.

170 ETSA Utilities' response to the Commission's detailed Questionnaire, Question 42 (page 34).

171 ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006",* page 6.

- depot-based supervisory and administration personnel, and head office based personnel also worked long hours to support the field restoration efforts; and
- there was good adherence to ETSA Utilities, "Working Hours and Rest Periods Instruction" and "Working in Hot Conditions Instruction", with no staff safety incidents during the heatwave.[172]

8.3 Conclusions

ETSA Utilities' policies and procedures (as in operation during the heatwave) for escalating problems on the LV network appear to have been inadequate, only addressing, and appropriately escalating, HV problems. The potential, therefore, was for LV outages to be overlooked at times when outages were also being experienced in the HV network.

ETSA Utilities had encountered problems with the HV network during previous heatwave events and when HV faults seemed to be under control it appears that ETSA Utilities' management felt that the heatwave situation was also under control.

The traditional practice of handling LV outage incidents (by devolving the handling to depots), despite this being the process adopted for previous extreme weather events, did not work for the January 2006 heatwave. The NOC had a poor understanding of the extent of the LV outage problem, compounded by difficulties it was already having in obtaining sufficient crews.

The Commission considers that this inadequate knowledge of the outstanding LV job status contributed to the failure to escalate the incident to senior management at an appropriate (earlier) time. It appears that the real problem occurred between Saturday afternoon and Sunday. Even here, as suggested by PB Associates, a small number of additional crews would have had a significant impact on the level of outstanding LV faults, if they had been available for the Saturday evening.[173]

The Commission suggests that, as a consequence of the inadequate knowledge of the LV network outage situation, it was not until midday on the Sunday (22 January) that decisive action was taken to achieve an adequate level of crewing. This inadequate level of knowledge also resulted in customer angst, with ETSA Utilities not being in a position to provide reliable restoration time advice to customers, which in turn placed unmanageable strains on its call centre operations.

PB Associates noted that there also appears to have been a lack of clarity within ETSA Utilities regarding final responsibility for the (high-level) deployment of resources. This lack needs to be resolved.[174] PB Associates put the view that the decision on whether or not to

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[172] ETSA Utilities' response to the Commission's detailed Questionnaire, Question 43.1 (page 34), updated with advice from ETSA Utilities in email dated 19 April 2006.

[173] PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 5.

[174] PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 67.

engage staff in remote areas in the restoration of LV supplies in the metropolitan areas should be made by network management.

The ERL2 was called reasonably late into the heatwave and it is arguable that, if ERL2 were called earlier, there would have been a more timely organisational response. Alternatively, the escalation hierarchy in the Emergency Reponses Procedures may have been better utilised by ERL1 being called on Friday when it was clear a major period of hot weather over a weekend was likely, enabling staff to receive an earlier warning.

It is recognised that there is a risk in calling an ERL2 event too early, as should the severe event not occur, and a heightened response not be required, then it could prove difficult to maintain staff alertness to such future warnings.

In any event, the main problem in the heatwave appeared to be that there was a lack of adequate information with which to assess the true position. Also, ERL2 was called on the Saturday morning, before the Saturday afternoon (21 January) increase in outstanding jobs, but the real response to the crew shortage did not emerge until mid-day on Sunday, apparently as a result of the lack of outstanding job information.

8.4 Recommendations

In response to the problems it encountered during the heatwave, ETSA Utilities has advised that it will in future:

- provide wider dissemination of "Emergency Response Level" Procedures to all relevant operational personnel and issue ETSA Utilities wide alerts to forewarn relevant personnel of forecast emergency conditions;
- develop new arrangements to maximise the number of personnel likely to make themselves available out of hours for extreme weather events.
- centralise procedures for sorting, managing and dispatching customer outage notifications in the NOC.
- implement a Maximum Restoration Time Policy to include an outage time (e.g. 10 hours) component when prioritising the restoration of single customers outages and outages affecting small groups of customers to ensure that all customers are reconnected within an acceptable time.[175]

The Commission endorses these initiatives.

Nevertheless, having regard to its findings in this areas as set out in this Inquiry Report, the Commission has made a number of recommendations in relation to operational response issues.

[175] ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006",* page 28.

Commission's Recommendation: Operational Response

The information available to the Commission suggests that there are opportunities for improvement in ETSA Utilities' operational response processes. The Commission recommends that ETSA Utilities give consideration to the following measures for extreme and/or emergency events:

- ***revising its internal processes and procedures for the management and tracking of low voltage network faults by retaining central control for this function;***
- ***defining a formal emergency risk management role, with the view to appointing a risk manager to the emergency response team;***
- ***exploring the need for non-operational staff (e.g., office-based staff) to be part of the response team during emergency conditions, to ensure that ongoing business culture development includes an emphasis on the "need to respond" during such conditions;***
- ***clarifying the internal responsibility for high-level decisions regarding the priorities for deployment of field resources; and***
- ***considering the use of qualified contractors to supplement the internal resources of ETSA Utilities in tackling widespread low voltage outages.***

The Commission will maintain a "light-handed" approach in this respect, as it retains confidence that ETSA Utilities will respond adequately to the findings that have emerged in this Inquiry with respect to its organisational response to the network outages that occurred during the heatwave.

9 CUSTOMER INFORMATION SERVICE RESPONSE DURING THE HEATWAVE

The Inquiry Terms of Reference ask the Commission to consider:

- customers' service experience during the heatwave, with particular regard to the performance of ETSA Utilities' call centre;
- the provision of information to customers during the period; and
- whether the location of ETSA Utilities' call centre impacted on the performance of that centre for South Australian customers and if different performance standards should apply to the operation of that facility.

This Chapter presents the Commissions conclusions and recommendations in relation to those matters.

9.1 Distribution Code Obligations

The key regulatory obligation relating to call centre operations is the service standard in the Electricity Distribution Code (clause 1.2.2 of Part A) requiring that the distributor must use its best endeavours to achieve a number of defined customer service standards during each year ending on 30 June, with one of the customer service measures being *"Time to respond to telephone calls"* with the standard of *"85% within 30 seconds"*.

The two key aspects of this obligation are that it is an annual standard and that ETSA Utilities must use its best endeavours, which is defined in the Electricity Distribution Code to mean: *"...to act in good faith and use all reasonable efforts, skill and resources"*.[176]

ETSA Utilities' call centre performs two important functions, by providing information to:

- ETSA Utilities on the location of network faults, for that component of the system not covered by remotely read fault detection equipment (SCADA); and
- customers, on the nature and predicted length of outages.

ETSA Utilities' SCADA (Supervisory Control and Data Acquisition) system enables the Network Operations Centre (NOC) to monitor faults remotely and continuously in part of the network - largely confined to the HV component in ETSA Utilities' case.

For most individual customers who are connected to the LV component of the network, ETSA Utilities, similar to other distributors, relies on customers who are experiencing supply problems (e.g. outages or voltage variations) directly contacting the distributor by ringing the Faults and Emergencies phone number. In such cases, ETSA Utilities collects and analyses the information received, determines the location of the outage and possible cause and then dispatches a field crew to the suspected location of the fault.

[176] See Essential Services Commission of SA, July 2005, *Electricity Distribution Code – EDC/05,* Schedule 1, Definitions, www.escosa.sa.gov.au/webdata/resources/files/050623-D-ElecDistCodeEDC05.pdf.

During normal operations, once the NOC has received a sufficient number of calls and obtained an understanding of the nature of the fault, then the IVR system should contain a recorded message capable of advising customers that ETSA Utilities is aware of a fault affecting supply in their area.[177]

That message should also advise customers of the approximate time that ETSA Utilities expects to be able to fix the fault. It may be the case that ETSA Utilities needs to advise a standard restoration time initially (e.g. 2 hours) until field crews have arrived at the fault scene and are able to make a more accurate assessment.

This was an area of failing during the heatwave, as ETSA Utilities was not in a position to provide accurate restoration times and, consequently, was not able to provide customers with the key information they were after.

PB Associates noted that:

> *the availability of up to date and accurate restoration information at an earlier stage may have resulted in long outages receiving additional attention and have enabled good quality customer feedback to be provided via the IVR*.[178]

When a customer rings ETSA Utilities' Faults and Emergencies phone number, they should be greeted with a message that invites them to select '1' for a life threatening situation (e.g. line down) to be put through directly to an operator, select '2' for power failures, select '3' for street light failures, or select '0' to be put through to a customer service officer or for any other enquiry.

If the customer selects '2' then the customer will be greeted by a pre-recorded message that either advises that ETSA Utilities is not aware of an outage in the area the customer is ringing from or advises that ETSA Utilities is aware of an outage in their area (and approximate restoration time). This is based on the IVR system using the caller-ID to identify the location of the caller, in order to provide a suitable message.[179]

If the customer receives a message that ETSA Utilities is not aware of an outage in their area, then the customer is invited to input their postcode or dial '0' to go to a customer service officer. On keying in their postcode, the customer will either receive a message advising them that ETSA Utilities is aware of an outage in their area, together with an expected restoration time, or be advised that the distributor is not aware of any outage. The customer will then be invited to talk to a customer service officer (in the case of advice that an outage is known, only if the pre-recorded information was not sufficient for the customer's needs).

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[177] In 'avalanche' conditions (i.e. where a very large number of outage calls are being received) the practice in the past (and in operation during the heatwave event) was for this fault information to be faxed directly to the relevant depots, for depot staff to determine restoration priorities.

[178] PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 61.

[179] This automatic location identification does not work for mobile phones, but as indicated further in this section, mobile phone users have the ability (as do other users) to key in their postcode.

Calls to the Faults and Emergencies phone number are handled by operators (customer service officers) in the call centre, which is located in Bendigo (Victoria). This is in accordance with a contractual arrangement between ETSA Utilities and the Victorian distributor Powercor, which specifies the service levels required by ETSA Utilities. This call centre also handles calls for the Victorian distributor Citipower.

The call centre is set up to handle 270 incoming calls at any one time, with the ability for up to 50 calls to be answered by trained operators at any time.[180]

It would be very costly for a distributor to maintain call centre arrangements that enabled customers wishing to talk to an operator during periods of high demand (e.g. during extreme weather events) to have the same level of service (i.e. speed of access to an operator) as during quiet times. These costs would, necessarily, flow through to all customers eventually, with the potential for higher electricity distribution prices.

It is, therefore, acknowledged throughout the world that customers will face some delay in talking to an operator in an electricity distributor's call centre during periods of high demand. Nevertheless, there still remains an onus on the distributor to handle calls efficiently, noting (as outlined above) the customer call centre acts as an information hub, with information not only flowing to customers, but also to the distributor in relation to the location and nature of faults.

9.2 ETSA Utilities' analysis of its customer information service response during heatwave

ETSA Utilities has acknowledged that call centre performance was influenced by the lack of up to date job progress information. ETSA Utilities stated that, during the heatwave, it directed efforts to restoration rather than ensuring restoration times were provided to the call centre in a timely fashion. It acknowledged that this resulted in more, and longer duration, calls to the call centre, which in turn resulted in longer wait times for customers in the call queue to operators.[181]

In addition, the coincident bushfires in Western Victoria also resulted in high call volumes for Powercor customers. ETSA Utilities has advised that the call centre did not give priority to Victorian customers.[182]

ETSA Utilities considered that as it was still meeting the annual call responsiveness standard of 85% of calls answered within 30 seconds for the 12 months ending 31 January 2006 (which

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[180] ETSA Utilities' response to the Commission's detailed Questionnaire, Question 12.11 (page 12). Represents total capacity of Bendigo and Melbourne call centres, which serves the needs of ETSA Utilities, Powercor and CitiPower. Total IVR ports available across the two contact centre sites are 270, with 300 ISDN lines. There are 64 fully fitted and configured workstations available, with a total of 56 staff to man the 24-hour call centre.

[181] ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006",* page 23.

[182] ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006",* page 24.

incorporated the heatwave), it was therefore meeting its customer (Electricity Distribution Code) obligations in relation to call centre performance, notwithstanding the performance during the heatwave.[183]

Nevertheless, ETSA Utilities has advised that its IVR messaging system will be improved to provide better information.[184]

ETSA Utilities has advised that it will improve its call handling capability through:

- establishing an Overflow Call Centre with 50 seats at Keswick in South Australia;
- transferring calls directly to the Overflow Call Centre once the ETSA Utilities staff are available;
- improved updating of the IVR messaging and the Operational Contingency Plan.[185]

ETSA Utilities has put the view that the sharing of its call centre with Powercor and Citipower in Victoria allows for higher average call centre staffing; increasing the ability to deal with higher call volumes.[186] The Commission accepts the logic of this view.

ETSA Utilities advises, and has provided evidence, that it was responsive to the media with the information that it had available, providing fax streams, media conferences and individual responses to all media enquiries, as well as timely updates through its website.[187] Further, a media conference was held on the Sunday (22 January), which included statements from the CEO of ETSA Utilities.[188]

9.3 Conclusions

The Commission notes the importance of the efficient and timely management of network and customer information by an electricity distributor during extreme operating conditions, both to assist the distributor itself in responding quickly to outages, and to ensure that customers are given reliable information about the likely length of outages. The customer call centre is very important in this respect.

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183 ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006",* page 3.

184 ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006",* page 5.

185 ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006",* page 28.

186 ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006",* page 23.

187 ETSA Utilities' response to the Commission's detailed Questionnaire, Questions 15 & 16 (page 14).

188 Whilst ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006",* page 21, makes reference to media conferences being held on both 21 and 22 January, in the material provided to the Commission for the detailed Questionnaire (Questions 15 & 16) reference is only made to a media conference being held on the Sunday. The advice provided also stated that at these conferences, all media questions were answered. In addition to the media conference(s), press releases were provided to all media outlets registered on the media Faxstream.

The Commission also notes that on various occasions during the heatwave customers experienced long delays in getting through to call centre staff and that often the information provided was inadequate.

The Commission therefore agrees with the view put by PB Associates that:

> *The effective, efficient and timely management of information is a critical success factor during abnormal or extreme business operating conditions. During heatwave periods, the collection, processing and communication of network and customer information is likely to be a significant contributor to the overall performance of the ETSA Utilities organisation in its ability to respond to the extreme weather conditions.*[189]

However, the operation of the call centre is critically dependent on the quality of the information on restoration times provided to it internally by other sections of the organisation. If the call centre operators are tied up dealing with frustrated customers wishing to get information on restoration times that is unavailable, there is a risk that customers with vital information on the extent and nature of outages may not be able to get this information through to ETSA Utilities in a timely manner.

While the call centre might end up bearing the brunt of any criticism of poor information being provided to customers, it is important to fully assess the nature of any problems experienced, in order to assess the extent to which problems are caused by factors outside the direct operation of the call centre. The call centre can only relay to customers the information it receives from other sections of the organisation; it does not have a role in pursuing such information and assessing its quality.

From public statements made by the ETSA Utilities' CEO and advice received from ETSA Utilities on action it is taking following its performance during the heatwave (see previous section), it is clear that ETSA Utilities recognises that in a number of areas its response during the heatwave was inadequate.

The Commission acknowledges that a call centre receiving the volume of calls experienced by the call centre during the heatwave will always be under stress.

While it would be unrealistic to expect that a distributor's systems would not be placed under stress during emergency conditions, the heatwave nevertheless revealed significant deficiencies in the information communication systems of ETSA Utilities, with both the timeliness and quality of responses affected by these deficiencies.

9.3.1 Poor Quality Information

While the calls of many customers were dealt with by the automated IVR system, the information provided was often of poor quality (e.g. inaccurately projected restoration times). The lack of quality information finding its way from the field to the call centre

[189] PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 32.

systems is likely to have resulted in repeat calls, increasing wait times and increasing customer frustration.

Thus, not only did customers not receive the information they required, it is apparent that in many instances they had to wait considerable periods of time to be told by an operator that ETSA Utilities did not have the information the customer was seeking.

Although, as ETSA Utilities has advised, field crews were concentrating on restoring supply, this did not mean that better staff organisation would not have allowed for more staff to be able to be in the field to enable both to occur (i.e. timely restoration and advice to customers).

It is considered unacceptable that during the peak period customers were waiting on average 51 minutes to talk to an operator, as detailed in this Inquiry Report.

Notwithstanding that the media was used by ETSA Utilities to a certain extent during the heatwave to provide information to the public, the usefulness of such information was questionable given that there was a general lack of knowledge in ETSA Utilities on the key information sought, being expected restoration times. Hence this potentially important vehicle for taking pressure off the call centre was not effective.

In a general sense, information flows also incorporate adequate internal communications, which appear to have been deficient during the heatwave. During the heatwave, the handling of LV outage management was devolved to the depots, involving manual handling of faxed outage advice (consisting of customer telephoned details) sent by the NOC. Such traditional handling methods contributed to the information flow difficulties and, as the number of LV outages escalated, the updating of the IVR system to reflect the status of restoration activities in the field became less timely.

ETSA Utilities has indicated that it is addressing this issue through centralisation of fault management at the NOC.

Centralisation of fault handling at the NOC is understood by the Commission to be good industry practice. Backed up by resources, training and internal procedures, the Commission would expect that this will assist the timely management of faults during future events and the provision of reliable advice to customers on expected restoration times. However, it will be important for ETSA Utilities to establish systems and processes to ensure the NOC is in a position to manage the resulting large flows of information.

The NOC will need to be able to handle large flows of information from customers and information back from field crews, and be able to combine this with details of its network and customer location in order to be able to manage the fault information and advice to customers adequately. This suggests that some sophisticated information management systems (including the OMS network connectivity system) will be

required in order that the problems experienced at the depots during the heatwave are not merely transferred to the NOC during future similar events.

The full implementation of the OMS by the end of 2006, as discussed in this Inquiry Report, will also facilitate improved status information on the completion of tasks.

9.3.2 Customer Service Measures

The Commission notes that ETSA Utilities considers that it has met its customer responsiveness requirements by ensuring that over the course of a year the annual standard of responding to 85% of calls within 30 seconds is achieved.

This is a somewhat shallow view of obligations to customers which does not give appropriate regard to the intent of the Electricity Distribution Code or the consumer protection objectives of the Commission in making that code. The obligation to "respond" to customers encompasses more than simply answering the phone. It is implicit in the standard that the distributor should generally be in a position to provide the customer with sufficient information to meet the customer's reasonable needs.

The Commission considers that ETSA Utilities' customer obligations extend beyond simply answering calls within a designated time. ETSA Utilities has an obligation to provide its customers with service, which includes assisting customers with the information they require.

9.3.3 Overload Events

The Commission notes that ETSA Utilities is unable to provide information regarding the number of "overload" calls made during the heatwave, i.e. the number of occasions on which customers rang the call centre and were simply not able to get through.

The Commission is concerned that, despite previous correspondence with ETSA Utilities regarding this issue, ETSA Utilities was not able to provide details of overload calls during the heatwave, so the Commission does not know how many customers rang the call centre and were not able to get through. From the customer questionnaire responses received there was evidence that some customers did receive an engaged or busy signal and had to call again later.

ETSA Utilities has provided the Commission with a copy of a letter dated 6 March 2006 from Silk Telecom[190] confirming that it is not currently possible to provide data on the number of calls from ETSA Utilities' customers which fail to reach the Bendigo call centre. The letter notes that Silk Telecom has been working with ETSA Utilities to design a solution to overcome this reporting deficiency.

The Commission will closely monitor ETSA Utilities' actions to address this issue and ensure that it is in a position to provide such overload call data in future, with the

[190] Silk Telecom combines the businesses of ETSA Telecoms and Powercor Telecom.

intention to include the provision of such data as a formal regular statistical information requirement in the next revision of Electricity Industry Guideline No.1.[191]

9.3.4 Previous Call Centre Improvements

The Commission has been working with ETSA Utilities over a number of years to improve the call centre performance for customers.

ETSA Utilities has improved the level of information that is generally available on the IVR system, having moved in recent years to provide information on an individual postcode basis.

The Commission is concerned that adjustments made to the call centre systems following widespread storms in late August 2005 were insufficient to prevent further inadequate call centre performance during the heatwave.

ETSA Utilities has advised that even with the improvements that were implemented in systems since the call centre problems experienced in the August 2005 storms, the wait time for customers to talk to an operator during the heatwave:

> *... became extended due to the imprecision of the available information. ETSA Utilities recognises the importance of trying to provide timely information on the status of outages and expected time of restoration.*[192]

Issues identified during the August 2005 storm event included:

- The failure of the Bendigo call centre's IVR, resulting in customers either not getting through to call centre operators or getting an erroneous message.
- Extended queues of customers during the storm event, with up to 147 customers waiting at one time, with a wait time of up to 47 minutes, and a significant number of customers "dumped" by the overload system.
- ETSA Utilities records show that of the 22,643 calls on 30 August 2005, only 1,841 were successfully managed by the call centre's IVR, and a further 1,635 were successfully answered by an operator (401 of which were answered within 30 seconds).
- ETSA Utilities acknowledged three main problems with its call centre performance: the volume of calls received; a technical issue affecting capacity; and operational practices within the call centre. The technical issue related to a misalignment of trunk lines, reducing the number of calls that could be connected to the IVR.

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[191] Refer to Essential Services Commission of SA, July 2005, *Electricity Regulatory Information Requirements – Distribution, Electricity Industry Guideline No.1,* http://www.escosa.sa.gov.au/webdata/resources/files/060614-ElectricityGuideline1.pdf.

[192] ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006",* page 24.

- ETSA Utilities also accepted that it needed to be more proactive in the media in providing advice on outages and to encourage customers not to contact its call centre unless there are lines down or they believe an outage has not been reported.[193]

As a result of the August 2005 storm event, ETSA Utilities advised the Commission that it had undertaken the following action:

- Rectified the technical issue relating to a misalignment of trunk lines with the effect of increasing the capacity of the call centre to a level where it is sufficient to handle avalanche conditions.
- Established an emergency backup facility to provide further capacity.
- Reviewed its internal procedures for updating advice on the location and duration of outages on its IVR system. The review identified that the main area for improvement was in the return of information from field staff. It also identified the need to raise employee awareness of the importance of frequent communication and ETSA Utilities advised that it has implemented policies to effect this outcome.
- Developed an outage webpage and associated media awareness.
- Corrected a number of human and system errors within its call centre, including tightening systems and protocols to ensure operator or technical error does not result in a repeat of system failure or restrictions.
- Reviewed the procedures for contact with emergency services (e.g. the State Emergency Services, Police, etc.) as a consequence of emergency service agencies expressing concern over not being able to contact ETSA Utilities during the storm-event. In consultation with the relevant emergency services agencies, ETSA Utilities undertook a review of the problems and implemented a number of procedures intended to substantially improve future emergency event management.[194]

The Commission notes that, while key improvements to the call centre were implemented after the August 2005 storms, updating the IVR system with information from field staff was a matter that ETSA Utilities advised it had addressed, but this matter was again a contributor to the poor IVR system response in the heatwave.

9.3.5 Location of Call Centre

The Commission has considered the impact of the Bendigo (Victorian) location of the call centre on its performance in providing timely, localised information to customers. The Commission is satisfied that this factor did not contribute materially to the call centre problems that occurred during the heatwave.

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193 Letter from ETSA Utilities to the Essential Services Commission of SA, dated 25 October 2005.

194 Letter from ETSA Utilities to the Essential Services Commission of SA, dated 25 October 2005.

The Commission considers that the actual location of the customer service centre need not adversely impact on the level performance experienced in providing information. ETSA Utilities has a program to train call centre staff on localities within South Australia and so the media cited instances (which were not substantiated to the Commission during the course of the Inquiry) of call centre staff not being familiar with particular locations during the heatwave will hopefully be rare.

The Commission accepts that a combined call centre will likely provide more capacity than organisations (i.e. ETSA Utilities, Powercor and CitiPower) providing separate centres. It does note, however, the risk of coincident peak demands which, given weather patterns affecting Victoria and South Australia, might occur quite regularly.

Full deployment of the OMS by end 2006 should enable much better identification by ETSA Utilities of the location of customer faults, and thereby provide better information to the call centre (both in terms of being more aware of which customers might be affected by a particular outage and in the OMS assisting crews to locate faults quickly and be better placed to advise reliable restoration times in a timely manner).

It is worth noting that responsibility for updating the IVR system messages resides in South Australia, at the Keswick headquarters of ETSA Utilities. This was also the case during the heatwave period, with ETSA Utilities having responsibility for updating the IVR system messaging.

While the Minister for Energy submitted that:

> *... having a stronger call centre presence in Adelaide would mitigate some of the public's frustrations in an event such as the heatwave...*[195]

the Commission was presented with no evidence during the course of the Inquiry which supports this proposition.

Indeed, as shown below in the discussion of the Victorian Electricity Call Centre Investigation, the proposition did not hold true in the Victorian heatwave, as the service provided to Victorian customers by a Victorian-based call centre appears to have been no better than the service provided to South Australian customers. This fortifies the Commission's view that the location of the call centre was not a problem during the heatwave. It therefore maintains that different performance standards should not apply to that facility.

Nevertheless, the Commission notes that ETSA Utilities has moved to establish an Overflow Call Centre at Keswick, in South Australia, with 50 seats to be staffed from ETSA Utilities' local staff. To the extent that there may remain any residual concerns over call centre location, this should serve to address those concerns.

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[195] Minister for Energy, submission to Draft Inquiry Report, Page 2.

9.3.6 Victorian Electricity Call Centre Investigation

Subsequent to the Commission receiving its terms of reference for the heatwave Inquiry, the Victorian Minister for Energy Industries provided terms of reference (9 March 2006) for the Essential Services Commission of Victoria (ESCV) to investigate and report on the performance of the Victorian electricity distribution call centres during wide-scale emergency situations, which coincided with the period under investigation for the SA heatwave inquiry.

The ESCV sought public submissions by 31 May 2006 on:[196]

- customers' experience in contacting the call centres during wide-scale emergency situations;
- views on the expected service levels of these call centres;
- views on alternative forms of communications between the distributors and the customers during wide-scale emergency situations; and
- views on the assistance that could be provided by the distributors to the customers on life-support equipment during prolonged wide-scale supply interruptions.

In response to this call for submissions, the ESCV received 25 submissions commenting on various aspects of distributors' call centre performance.

The majority of submissions were from rural customers and from local government representatives or groups such as the Victorian Farmers Federation speaking on behalf of rural customers. Dairy farmers in particular figured prominently in the submissions. The common themes running through these submissions were as follows:

- Customers experienced difficulties in contacting call centres to report outages – ranging from inability to get through at all (congestion problems) to extended delays (in some cases amounting to hours);
- When contact was made, recorded messages were incorrect – in some cases restoration times were underestimated (this was a particular problem for dairy farmers who claimed that they would have made alternative milking arrangements if they had been aware of the possibility of extended outages) while in other cases the message indicated that there was no problem in the particular postcode that the customer had entered in the automated system;
- In cases where customers spoke to call centre operators, there were complaints that, in some instances, the operators continued to insist that there was no supply outage in the customer's area;

[196] See Essential Services Commission, Victoria website www.esc.vic.gov.au/index215.html.

- Several submissions raised safety concerns in relation to the inability of customers to contact call centres promptly to report matters such as fallen live lines.

The Commission notes that the ESCV has released a draft Report on Victorian distribution businesses' call centre performance of during wide-scale emergency situations, which deals with the severe weather events experienced in that State in January 2006 (which were similar to the South Australian experiences).[197] While the report is only a draft at this point, the findings of the ESCV are broadly consistent with the findings of the Commission in this Inquiry.

The Commission will continue to monitor developments in the Victorian Inquiry and discuss regulatory outcomes with the ESCV.

9.4 Recommendations

An option open to the Commission is to codify a number measures. However the Commission notes that ETSA Utilities has already moved to implement a number of improvements.

Accordingly, the Commission's preferred approach, at this stage is to work with ETSA Utilities to have the above measures adopted. If such an approach, or similar were to fail to be adopted by ETSA Utilities as demonstrated by its performance in a future extreme weather event, then the Commission may be left with no alternative but to codify such requirements. The Commission will also require audits of relevant systems and processes.

Commission's Recommendations: Customer Information

The Commission recommends that ETSA Utilities consider the adoption and implementation of a more integrated communications strategy (during extreme weather events involving extensive outages), which encompasses the following matters:

- ***detailed and reliable information on expected restoration times updated to the IVR system on a regular basis;***
- ***regular updates to key media outlets during extreme weather events, including access to ETSA Utilities' personnel, rather than assuming that media staff will have the understanding and take the time to interpret website information (at least initially);***
- ***maintaining reliable, accurate and timely information on the ETSA Utilities' website;***
- ***generating information (for internal purposes) on call centre overload events (this information would also be required to be incorporated into periodic performance reporting to the Commission); and***

[197] For a copy of the draft Inquiry Report, refer the ESCV website, http://www.esc.vic.gov.au/NR/rdonlyres/6019B23D-5844-4D18-841E-7A7DD6D24E92/0/RPT_DraftReportOnCallCentreReviewFindings20060831.pdf.

- ***appointment of depot liaison officers to the emergency management team.***

The Commission also recommends that ETSA Utilities complete the implementation of the Outage Management System and connectivity model by the end of 2006.

10 GOOD ELECTRICITY INDUSTRY PRACTICE

Term of Reference 3.4 asks the Commission to consider whether the performance of ETSA Utilities was consistent with good electricity industry practice (GEIP) as defined in the National Electricity Rules.

This Chapter reviews the adequacy of ETSA Utilities' response in meeting this yardstick. GEIP is assessed according to the three key areas of Network Management, Resource Management and Information Management.

10.1 Definition of Good Electricity Industry Practice (GEIP)

The NER (and previously the National Electricity Code) utilise the concept of GEIP in relation to the standards required of participants registered to take part in the National Electricity Market. For example, clause 5.2.1(a)(3) provides that Registered Participants must maintain and operate all equipment in accordance with, amongst other things good electricity industry practice.

The term GEIP may therefore be considered as a term of art, with a definition contained within the NER as follows:

> *The exercise of that degree of skill, diligence, prudence and foresight that reasonably would be expected from a significant proportion of operators of facilities forming part of the power system for the generation, transmission or supply of electricity under conditions comparable to those applicable to the relevant facility consistent with applicable regulatory instruments, reliability, safety and environmental protection. The determination of comparable conditions is to take into account factors such as the relative size, duty, age and technological status of the relevant facility and the applicable regulatory instruments.*[198]

In simple terms, the standard that GEIP requires of an entity in any given case is the standard that a reasonable person would expect of a significant proportion of similar entities operating in similar conditions.

In making this assessment, there are two classes of performance that are relevant: the actual performance of entities operating in similar conditions (the objective element of the standard); and the reasonably expected performance of entities operating in similar conditions (the subjective element of the standard).

In terms of the objective element, ideally benchmarking studies of a number of similar entities would be undertaken. The comparison of performance of interstate organisations is particularly important in the case of ETSA Utilities, as it is the sole provider of distribution services in SA.[199] On a cautionary note, however, there are acknowledged difficulties in obtaining sufficient information on the performances of comparable interstate entities from

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198 National Electricity Rules (NER), Version 9, Chapter 10 Glossary.

199 The problem of comparing performance across distributors is not confined to extreme weather events, but is also encountered in comparing annual reliability performance, for reasons such as differences in data definitions, as well as differences in the nature of individual distributor operations (e.g. due to differences in the type of geographical coverage). Achieving the ability to compare such performances is a key task requiring some concerted effort by all relevant parties.

which appropriate assessments can be made. This is particularly so when attempting to assess performance during a limited time period such as extreme weather events. Nevertheless, the Commission has attempted in this Inquiry to undertake such comparisons.

In terms of the objective element, that performance will necessarily be a subset of the first due to the standard's requirement for the exercise of normative judgment as to what a reasonable person might expect in the circumstances having had regard to all of the factors specified. This element allows the standard to be flexible and dynamic, as what the community at large might consider reasonable performance at any given point in time may not be considered reasonable performance at a later point in time.

In this way the standard escapes the risks associated with a purely objective assessment of performance against other distributors, which could permit the lowest common denominator to prevail. It also avoids the problems associated with codification of "reasonableness", thereby permitting decisions as to what is reasonable to be made in line with current laws and ways of thinking, and to adapt the standard to individual cases and changing societal and/or technological circumstances.

By way of example, even if the majority of distributors experienced outages of 10 days' duration, and assuming that the general regulatory environment is as presently set, it might nevertheless be reasonably expected that, notwithstanding actual performance, a significant proportion of distributors ought to be achieving a higher standard in light of all the relevant factors. Of course, the Commission is not suggesting that such a disconnect exists presently in the Australian context, but it is useful to note the inherent flexibility in the regulatory environment put into place by Governments across Australia.

On analysis therefore, the standard required is one within a reasonable range of the actual performance outcomes observed in relation to ETSA Utilities' peers. If within such a range, then ETSA Utilities is considered, for the purposes of the NER, to have met the GEIP standard.

As a final observation, the GEIP standard imposed under the NER may be contrasted with the more stringent "best endeavours" standards imposed upon ETSA Utilities by the Commission through South Australian regulatory instruments.

10.2 Network Management

ETSA Utilities' position in its submissions to the Inquiry is that it achieved GEIP in managing the distribution network during, and in preparation for, the heatwave. On analysis, the Commission has concluded that ETSA Utilities did met GEIP in these areas.

In arriving at this conclusion, the Commission has had regard to PB Associates' opinion of that ETSA Utilities *"...met GEIP in respect to key aspects of its network management"*[200], as well as the evidence presented by ETSA Utilities that:

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[200] PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 64.

- there was no overload of Connection Points, Zone-Substations, Sub-transmission lines or HV feeders during the heatwave, suggesting that the preparation of the HV network for peak load conditions worked well;
- there was a reduced number of LV fuse operations (e.g. fuses blowing) compared to previous peak loads, with ETSA Utilities having completed work on more than 500 LV transformers during the lead up to the 2005/06 summer;
- there was a relatively low number of LV transformer faults (238 out of 63,777 transformers connected to the network); and
- no public safety incidents were attributable to network faults.[201]

While the Commission was unable to obtain a benchmarking study of network management performance as part of its assessment of ETSA Utilities' performance in this area, it is not considered that this precludes such assessment against the GEIP standard. In this regard, PB Associates provided opinion to the Commission, which the Commission accepts, that publicly available reports on network planning and network design provide sufficient information for a comparison of relative performance in the key areas relevant to the heatwave.

Further, PB Associates was able to provide the Commission with the outcomes of its review of the basis upon which ETSA Utilities plans its distribution network to cope with peak demand compared with that employed by Victorian and other distribution businesses in Australia. One of the key aspects of the review was an assessment of the manner in which planning processes took into account temperature-based probability standards in demand forecasts.

That review indicates that a significant proportion of businesses plan their distribution networks based on 50% Probability Of Exceedance (PoE) temperature, having regard to the 10% PoE. The PoE describes the probability that the maximum temperature in a particular year will exceed the long-term average maximum temperature:

- the 10% PoE temperature is the weekday average temperature not exceeded, on average, more than 1 in every ten years;
- the 50% PoE temperature is the weekday average temperature not exceeded, on average, more than 1 in every 2 years;[202] and
- the 90% PoE temperature is the weekday average temperature not exceeded, on average, more than 9 in every ten years.

The approach used by ETSA Utilities is similar to this, however, as PB Associates noted:

> *ETSA Utilities plans its distribution system based on the most recent extreme summer temperature (2000-01) and measured load growth rates. This forecast is then modified to account for economic factors, appliance saturation and pricing signals.*[203]

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201 ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006"*, page 27.

202 Forecasting under a PoE 10% assumption therefore plans for the system to cope with a more extreme weather event than under a PoE 50% assumption.

This difference in approach does not, per se, mean that ETSA Utilities did not meet the GEIP standard, as the standard is outcome rather than process based. It is therefore necessary to consider the outcomes of ETSA Utilities' planning practices as observed during the heatwave.

Information available from the BoM shows that the temperatures in Adelaide during the heatwave were a 1 in 20 year occurrence, indicating that the actual temperature experienced during the heatwave exceeded the 50% PoE temperature. Indeed, it exceeded the 10% PoE temperature.[204]

Under such circumstances, it would be reasonable to expect that some network constraints would occur, whereas actual experience was that only a relatively small number of LV transformers experienced capacity related issues during the heatwave.[205] This fact has led the Commission to conclude that while ETSA Utilities' planning practices may differ from those of its peers, nevertheless the observed outcomes support the proposition that the GEIP standard was met in this regard.

Further, as PB Associates noted, the Queensland Review[206] recommended that distributors adopt weather forecasting assumptions for network planning to take account of very hot weather conditions, suggesting that the current industry performance standard may be changing to an approach more in line with that adopted by ETSA Utilities.[207]

Based on all of this evidence, the Commission has reached the following conclusions which underpin its findings that ETSA Utilities met the GEIP standard in managing the distribution network during, and in preparation for, the heatwave:

- while the actual temperatures during the heatwave exceeded the 10% PoE temperature, the heatwave had a relatively small impact on the distribution network; and
- ETSA Utilities adopts similar network layout, design and system planning standards for its LV network as other Australian distributors.

10.3 Resource Management

The Commission has concluded that ETSA Utilities met GEIP in resource management in relation to the heatwave.

In reaching this conclusion the Commission has had regard to the evidence put before it by ETSA Utilities that:

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203 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 59.

204 Bureau of Meteorology (South Australian Regional Office), 2006, *Monthly Climate Summary.*

205 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 59.

206 The Queensland Review refers to the "Detailed Report of the Independent Panel, Electricity Distribution and Service Delivery for the 21st Century", Queensland, July 2004, which was in response to the impact on Queensland distribution networks of a series of storms and hot weather in January and February 2004.

207 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 59.

- 94% of customers affected by HV outages during the heatwave had supply restored within 3 hours;
- the average restoration time for all outages during the heatwave was 131 minutes, compared to a normal average for a year of 100 minutes;
- the number of after hours emergency response crews in the metropolitan area was nearly doubled, and also increased in country areas;
- it was able to provide depot based supervisory and administration personnel, and head office based personnel on overtime shifts to support the field restoration efforts;
- it was able to maintain field personnel in emergency response conditions for extended periods of time in temperatures in excess of 40ºC, with no staff safety incidents;
- there were no materials shortages of any significance, indicating that the stocking program for summer extremes was appropriate;
- replacement transformers were pre-placed at strategic locations for quick response; and
- response vehicles were fuelled and response trucks fully stocked with fuses and other materials.[208]

As outlined earlier in this Inquiry Report, ETSA Utilities acknowledges that a small number of customers encountered unacceptably long outages and it has initiated a number of actions to address the problems experienced during the heatwave.

The Commission has also had regard to PB Associates' opinion that, while opportunities for improvement in resource management have been identified (both by ETSA Utilities and PB Associates):

> *…it is unlikely that ETSA Utilities' response was significantly worse than other distributors operating under similar circumstances. Hence, it is PB Associates' view that there is no indication that ETSA Utilities has not met GEIP in respect to its resource management activities.*[209]

While PB Associates was unable to undertake a benchmark study of resource management performance, it advised the Commission that publicly available reports provide sufficient information for a comparison of relative performance in areas such as: staff and equipment availability; efficient provision and allocation of resources; and adequacy of emergency response procedures.[210]

PB Associates put the view to the Commission that:

- *there is no indication that a significant proportion of other businesses have superior arrangements for ensuring the availability of personnel out of normal work hours;*

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208 ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006",* page 27.

209 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 63.

210 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 62.

- *South Australian, Queensland and Victorian distributors have all experienced difficulties, when extreme events occur, in obtaining accurate and timely feedback from field personnel about the status of work;*
- *a number of key areas have been identified where improvements in resource management could be made that impact on the efficient allocation of resources.[211] The Victorian storm review and the Queensland Review indicate that distributors in Victoria and Queensland have experienced similar difficulties;[212]*
- *ETSA Utilities lacks a well developed connectivity model that allows automation of part of the fault identification process. Conversely, the Victorian distributors (and others) have had a well developed connectivity model for more than ten years;*
- *ETSA Utilities' approach of devolving individual customer call collation to the depots resulted in a poor overview of jobs outstanding, particularly low voltage network faults. This is the approach traditionally adopted by many distributors. Many distributors, however, are moving to central coordination of all faults;*
- *as measured by CAIDI, ETSA Utilities' overall response to the heatwave was similar to that by other distributors during extreme events; and*
- *ETSA Utilities restored supply in similar timeframes to those experienced by other distributors in similar extreme circumstances.[213]*

PB Associates noted that emergency response procedures are generally not designed to respond to a large number of dispersed events, such as occurred during the heatwave, with appropriate escalation trigger points difficult to define for such events. Further, PB Associates suggested that distributors which have moved to central dispatch for the control of all faults will be better placed to respond.[214]

While the Commission has concluded that ETSA Utilities met GEIP in resource management in relation to the heatwave, as outlined elsewhere in this Inquiry Report, ETSA Utilities could improve its performance in this area during extreme weather events.

Of particular note with respect to the heatwave is the need for ETSA Utilities to adopt better systems and approaches to monitor the severity and number of network outages, particularly LV outages during network outages that affect a large number of customers.

ETSA Utilities' inability to:

- ▲ adequately prioritise repair work (especially in relation to the LV network);
- ▲ allocate an appropriate number of repair crews to the outages;
- ▲ monitor the status of completed and outstanding repair work; and

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211 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 63, footnote 111. Areas include: LV job identification, CaMS Staff recall management, maintaining an overview of the outstanding job's restoration time frames, and maintaining an overview of available and optimal resource levels.

212 The Victorian storm review refers to the "Report on the Adequacy of the Victorian Electricity Distributors' Response to the February 2005 Storms", PB Associates, June 2005.

213 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 62.

214 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 63.

- keep customers informed of the status of the outages and the associated repair work;

were key factors that led to the public concern with ETSA Utilities handling of the heatwave.

10.4 Information Management

The Commission has concluded that in the area of information management there is some doubt that ETSA Utilities' performance was consistent with a GEIP standard at the time of the heatwave. On the basis of the materials before it, however, the Commission is not able to conclude that the GEIP standard was breached in this area. This conclusion is driven by the lack of an objective standard against which ETSA Utilities' performance in this area can be assessed for then purposes of the GEIP standard.

In reaching its conclusion, the Commission has had regard to ETSA Utilities' assertions and supporting arguments that it complied with its Electricity Distribution Licence, the Electricity Act, National Electricity Rules, Electricity Distribution Code and other Codes and Guidelines, and that, subject to the resources available to it, satisfied GEIP in relation to information management and other areas of its operation for the heatwave event.[215]

The Commission also considered ETSA Utilities' submission in response to the Draft Inquiry Report asserting that the Commission had *"concluded that ETSA Utilities did not use 'good electricity industry practice' in regard to information management*".[216] ETSA Utilities went on to state in that submission that the Commission has "*no evidence*" on which it could base such a conclusion.[217]

Those submissions are, of course, misguided, as the Commission's draft conclusion was not that the GEIP standard was not met in this area but rather was that, as is the case in this Inquiry Report, that there is *some doubt* whether ETSA Utilities' performance was *consistent with* the GEIP standard at the time of the heatwave.

In addition to the evidence and submissions put by ETSA Utilities, the Commission has had regard to the opinion provided by PB Associates, including the following:

> *Given the number of information management issues identified in this report, however, and given that the Victorian and Queensland distributors undertook to improve performance more than 12 months ago, it is reasonable to assume that ETSA Utilities are currently lagging the performance of a significant number of distributors and will need to improve to maintain GEIP in this area.*[218]

While PB Associates was unable to undertake a benchmark study of information management performance as part of its review, it considered that publicly available reports provided sufficient information for a comparison of relative performance in key aspects of information

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215 ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006",* pages 2 & 27.

216 ETSA Utilities, July 2006, *Submission to Heatwave – Draft Inquiry Report*, page 7.

217 ETSA Utilities, July 2006, *Submission to Heatwave – Draft Inquiry Report*, page 7.

218 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 62.

management, including call centre overflow management, timely and accurate IVR messages, feedback to customers about outage information and other call centre operational issues.

PB Associates was of the view that in comparing ETSA Utilities' performance in these areas with the reported performance of the Victorian distributors:

- *both the Victorian distributors and ETSA Utilities experienced difficulties in maintaining accurate information on their IVR;*
- *the availability of up to date and accurate restoration information at an earlier stage may have resulted in long outages receiving additional attention and have enabled good quality customer feedback to be provided via the IVR;*
- *ETSA Utilities was largely reactive to the media interest whereas some Victorian distributors use the media to convey outage information to customers on a local area basis; and*
- *the Queensland Review indicates that the Queensland distributors also experienced difficulties in their information management during extreme events.*[219]

PB Associates noted that the structure of ETSA Utilities' IVR system appears to be consistent with the intent of providing the most detailed information to customers possible.[220] However, in common with other distributors, ETSA Utilities did not appear to have in place processes to maximise the potential of its IVR system to provide the best possible information to customers during extreme events.[221]

The PB Associates' reference to the Victorian and Queensland improved performance relates to the findings and recommendations of the 2005 Victorian storm review (responding to impacts of February 2005 storms on the Victorian distribution networks) and the 2004 Queensland Review (responding to impacts on Queensland distribution networks of a series of storms and hot weather in January and February 2004). The 2005 Victorian storm review made recommendations in the areas of customer call management, customer information provision and media communications.

The 2004 Queensland Review made a range of recommendations in the areas such as distributors investigating opportunities to use the media as a means of providing customers with up to date information regarding restoration of service and reducing the number of calls made to call centres. It also recommended that distributors ensure regular staff training occurs to assist in the coordination of tasks such as the communication of outage information.

On the basis that these interstate review recommendations have in the main been adopted and implemented, then some seven interstate distributors will have moved to a higher standard of information management over the past couple of years. The Commission concludes that ETSA Utilities should also adopt a higher standard in the area of information management.

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219 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 61. It should be noted that Powercor, CitiPower and ETSA Utilities use the same call centre at Bendigo, although it is likely that the service levels will vary depending on the specific service level agreements.

220 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 54.

221 PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 55.

As argued earlier in this Inquiry Report, the Commission's position is that the Electricity Distribution Code telephone call responsiveness standard necessarily implies more than simply answering a customer's call - it requires ETSA Utilities to be able to provide the caller with useful information. To conclude otherwise would be at cross-purposes with the underlying consumer protection intentions of that section of the Code. Importantly, the obligation requires ETSA Utilities to use its *"best endeavours"* to achieve the standard and defines best endeavours as acting in good faith and using all reasonable efforts, skill and resources.

The Commission is concerned that, notwithstanding previous requests to ETSA Utilities that it ensure that it is able to report on such instances, ETSA Utilities is still not in a position to report on the level of call overload (where customers are dropped or receive an engaged signal).[222]

In the materials provided to the Commission by ETSA Utilities stating why it could not currently provide such customer overload information, it is indicated that once a reporting proposal due to be put to ETSA Utilities is accepted it would only take approximately two weeks to implement. This suggests to the Commission that the solution is not overly complex. According to the advice, the reporting system will enable detailed inbound call analysis and reporting functionality as and when required. The Commission believes that ETSA Utilities should achieve this level of functionality at the earliest opportunity.

Information provided by ETSA Utilities indicates that the media interest and awareness was tracked throughout the heatwave and that senior officers, including the CEO, were available and did, indeed, conduct interviews. However, the information provided also indicates that ETSA Utilities was largely reactive to the media interest, and the quality of information was poor judging by the quality of information available to customers on restoration times. An active approach was adopted by TXU (now TRUenergy) during the 2005 storms in Victoria, in which it used prearranged media contacts to convey information by broadcast radio to specific areas during widespread outages of its network.

It is noted that many distributors are implementing or investigating alternative forms of communications with their customers, such as the internet, SMS messaging and direct telephone contact.[223] ETSA Utilities has already implemented a 'Current Power Interruptions' page on its website.

10.5 Conclusions

The Commission has concluded that ETSA Utilities met GEIP in network management and resource management, although opportunities have been identified for improvement in those areas by ETSA Utilities and the Commission.

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[222] PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 54.

[223] PB Associates, April 2006, *ETSA Utilities Network Performance and Customer Response during the heatwave of 19-22 January 2006: An independent review*, page 55.

However, the Commission has concluded that in the area of information management, there is some doubt that ETSA Utilities' performance was consistent with a GEIP standard at the time of the heatwave. The Commission has not, however, concluded that the GEIP standard was breached in this area.

10.6 Recommendations

As the Commission has concluded that ETSA Utilities met the GEIP standard during the heatwave in relation to network management and resource management, it makes no recommendation in respect of those matters. In relation to meeting a GEIP standard for information management, ETSA Utilities has identified a number of actions it intends taking to improve its performance in that area, including:

- improvements to its IVR system to provide better information;
- adopting processes and procedures for handling LV outages, which will improve the level of restoration time advice it can provide to customers;
- implementation of OMS, which will be able to provide job completion status; and
- establishing an overflow call centre.[224]

Commission's Recommendation: Information Management

The Commission has confidence that, if the information management improvements identified in this Inquiry Report and by ETSA Utilities itself are implemented, ETSA Utilities should be in a position to meet the Good Electricity Industry Practice standard. The Commission therefore recommends that ETSA Utilities implement these and any further improvements as quickly as possible.

[224] ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006",* page 5.

11 COMPLIANCE WITH, AND ADEQUACY OF, REGULATORY OBLIGATIONS

The Notice of Reference contains two Terms of Reference that require the Commission to investigate and make determinations concerning the regulatory obligations that apply to ETSA Utilities.

Term of Reference 3.2 requires the Commission to determine two distinct matters: first, whether or not ETSA Utilities complied with its regulatory obligations as established under the Electricity Distribution Code and the Electricity Act; secondly, if those obligations should be amended in light of the heatwave.

Term of Reference 3.3 requires that the Commission determine in more detail whether a subset of a regulatory obligation called up under Term of Reference 3.2, the level of payments available under the Guaranteed Service Level Scheme, should be increased to provide increased incentives for ETSA Utilities to meet determined levels of reliability.

This Chapter addresses the requirements of those two Terms of Reference. In doing so, regard is had to the matters specified in Term of Reference 3.5. To better deal with the two elements of Term of Reference 3.2, the compliance issues are dealt with separately from the consideration of the need to amend any obligations.

11.1 Compliance with regulatory obligations

Term of Reference 3.2 requires that the Commission determine ETSA Utilities' compliance with its regulatory obligations as established under the Electricity Distribution Code and the Electricity Act.

Several preliminary observations may be made in relation to this element of the Terms of Reference.

First, while the main focus of the Inquiry is on the performance of ETSA Utilities distribution network and call centre during the heatwave (i.e., between 19 to 22 January 2006), that particular performance is linked to the general behaviours and practices of ETSA Utilities. This is reflected in clauses 3.5.1 and 3.5.2 of the Term of Reference, where it is acknowledged that the performance issues were contingent upon previous practices. As a result, the Commission's consideration and determination is not limited to the period 19 to 22 January 2006, but also encompasses past management and practices which had a connection with the performance of the distribution network and call centre during the heatwave.

Secondly, only those obligations which go to the performance of the network and the call centre in the context of a heatwave have been considered by the Commission. Again, however, the Commission has not limited its consideration to obligations that might have applied only during the heatwave. For the same reasons as are set out above, the relevant obligations in the context of this Inquiry are those which have a connection with, or bearing

upon, the performance of the distribution network and call centre during the period of the heatwave.

Thirdly, in terms of the Commission's responsibility to make determinations as to ETSA Utilities' compliance, it is important to note that an Inquiry for the purposes of Part 7 of the ESC Act is an administrative process and not a judicial process. While the Terms of Reference ask the Commission to "determine" whether ETSA Utilities complied with regulatory obligations, this task is taken to mean that the Commission must express a view on these matters, as the Commission's Inquiry powers under the ESC Act do not permit the Commission to make a binding determination of the legal rights and obligations of parties.

11.2 Electricity Distribution Licence obligations

In order to operate the distribution network, ETSA Utilities must hold a licence issued under Part 3 of the Electricity Act.[225] As required by that Act, the licence contains conditions that ETSA Utilities must comply with when operating the distribution network. Certain of those conditions are relevant in the Commission's consideration of the extent of ETSA Utilities' compliance with its regulatory obligations during the heatwave.

Clause 6.1(a) of the licence requires ETSA Utilities to comply with a number of industry codes made by the Commission, including the Electricity Distribution Code. Clause 6.1(b) more specifically requires ETSA Utilities to comply with any minimum service standards imposed by the Electricity Distribution Code.

Clause 6.1(d) of the licence requires ETSA Utilities to comply with the requirements relating to the standard connection and supply contract for all customers established under Part B of the Electricity Distribution Code.

Finally, clause 28 of the licence requires ETSA Utilities to comply with all applicable laws including the Electricity Distribution Price Determination (EDPD).

To ascertain regulatory compliance with these licence conditions, it is necessary to consider in detail the scope of the various licence obligations in the context of both the particular regulatory instruments to which they refer and the heatwave.

11.3 Electricity Distribution Code obligations

The Electricity Distribution Code is made by the Commission under section 28 of the ESC Act. That Code regulates the terms on which ETSA Utilities connects, and supplies electricity to, customers, including the service standards that apply to ETSA Utilities. It also mandates the terms and conditions of a standard connection and supply contract under which ETSA Utilities delivers those services.

[225] *Electricity Act 1996*, sections 15(1), 15(2)(b).

In assessing ETSA Utilities' compliance with the provisions of the Electricity Distribution Code, and thus with clauses 6(1)(a) and 6(1)(b) of ETSA Utilities' electricity distribution licence, the Commission has considered each relevant regulatory obligation in the code.

11.3.1 Service Standards

There are three elements to the service standard framework established under the Electricity Distribution Code: customer service; reliability; and quality of supply.

The customer service and reliability of supply standards require ETSA Utilities to use its "best endeavours" to meet specified targets in the areas of:

- annual telephone responsiveness measured as the proportion of calls answered within 30 seconds;[226] and
- annual reliability performance averaged across customers connected to the distribution network within specified geographic regions.[227]

In both cases, the relevant annual period is the financial year. The term "best endeavours" is defined to mean, "to act in good faith and use all reasonable efforts, skill and resources". Such annual standards for specific regions represent the most common type of performance standard applied to electricity distributors in Australia.

Of course, annual standards cannot be directly assessed over a short time period such as that of the heatwave. Nor are they easy to apply to a group of customers that do not fit neatly within the defined regions. On that basis, it is not possible at this stage to conclude that ETSA Utilities has not complied with the customer service and reliability standards as a direct result of the heatwave.

In contrast to these annual best endeavours standards for customer service and reliability, the quality of supply standards are absolute in nature. That is, ETSA Utilities is required to ensure that the distribution network is designed, installed, operated and maintained such that the electrical characteristics of supply are as specified at clause 1.2.4 of the Electricity Distribution Code.

The gravamen of clause 1.2.4 is not that the quality of supply at each connection point to the distribution network is at all times of a specific standard, but rather that the network is to be designed, installed, operated and maintained by ETSA Utilities such that it is capable of delivery at the standards outlined in the clause.

These elements of the service standards framework are discussed in more detail below in the context of the heatwave.

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226 Essential Services Commission of SA, July 2005, *Electricity Distribution Code (EDC/05)*, clause 1.2.2.

227 Essential Services Commission of SA, July 2005, *Electricity Distribution Code (EDC/05),* clause 1.2.3.

Customer Service

ETSA Utilities has argued that it has met the annual telephone responsiveness standard (at least 85% of calls answered within 30 seconds) for the 12 months ending 31 January 2006, i.e. for a year incorporating the heatwave. It also claims that, even for the 4-day period of the heatwave, its responsiveness during the 30-second period stood at 66% of calls answered.

The Commission notes, however, that such claims fail to account for variability in the quality of responses provided to customers, particularly through the IVR system. Responses given to customers through the IVR system during the heatwave were often misleading and of little value to customers.

It is also likely that there were many "overload" calls during the heatwave as customers were simply unable to get through to the call centre. ETSA Utilities is unable at present to provide data on the number of such "overload" calls. Nevertheless, as noted in section 10.4, ETSA Utilities has stated that it should not take very long to implement a system to enable detailed inbound call analysis and reporting functionality as and when required. On this basis the Commission believes that ETSA Utilities should achieve this level of functionality at the earliest opportunity.

Reliability

The Commission has commented previously on the impact of extreme weather events on the achievement of annual performance standards,[228] and has suggested that the adequacy of processes that ETSA Utilities has in place to deal with such events is a relevant consideration as to whether or not ETSA Utilities applied a "best endeavours" approach in seeking to meet the annual standards.

In terms of reliability performance, the Commission has concluded that the HV network performance during the heatwave was satisfactory having regard to the particular circumstances of the event. Of particular relevance in that conclusion is the extreme nature of the event.

At the same time however, the Commission has noted significant concerns about LV network supply restoration times, and has suggested that the Emergency Response Procedures of ETSA Utilities were shown during the heatwave to be inadequate in the tracking of LV outages. This is partly a question of information management during an extreme weather event, and the Commission has reached the conclusion that there is some doubt that ETSA Utilities' information management performance was consistent with a good electricity industry practice standard at the time of the heatwave. The Commission has further concluded that the procedures of ETSA Utilities for dealing with LV outages in extreme weather events were not consistent

[228] See, for example, Essential Services Commission of SA, February 2006, *Essential Services Commission Act 2002 – Part 7 Inquiry: ETSA Utilities' Network Performance and Customer Response January 2006 – Issues Paper*, page 23.

with a "best endeavours" approach to meeting annual performance standards for either reliability performance or telephone responsiveness.

However, as outlined above, these concerns do not lead the Commission at this stage to a conclusion that ETSA Utilities has breached the relevant standards. It is likely that reliability performance and telephone responsiveness for the 2005/06 year will be influenced in only a small way by performance during the heatwave.

Quality of Supply

The key question to be addressed in assessing ETSA Utilities' compliance with the quality of supply obligations under the Electricity Distribution Code is not whether a particular quality was delivered at each relevant connection point during the heatwave but is rather whether ETSA Utilities' systems and processes are sufficient to ensure that the distribution network is designed, installed, operated and maintained so as to deliver the required quality.

The practical difference between these two questions is that the former requires an analysis of individual connection point voltage characteristics during the heatwave, whereas the latter requires an assessment of overall systems and processes (albeit that the assessment will necessarily be informed by connection point performance at an aggregate level).

As identified earlier in this Inquiry Report, the Commission has assessed ETSA Utilities' overall systems and process in regard to quality of supply, having particular regard to the events during the heatwave. The Commission's conclusion arising from that assessment is that while there were clearly individual experiences of low voltages during the heatwave, ETSA Utilities nevertheless did comply with the quality of supply obligations established under clause 1.2.4 of the Electricity Distribution Code prior to and during the heatwave.

11.3.2 Standard connection and supply contract

Clause 1.1.1 of Part A of the Electricity Distribution Code requires ETSA Utilities to use the standard form connection and supply contract set out in Part B of that code as the basis of its contractual relationship with its customers.

The effect of the clause is that there is a legally binding contract in place between ETSA Utilities and each electricity customer for the connection of the customer's supply address to the distribution network and for the ongoing supply of electricity to that supply address by ETSA Utilities. As in all contracts, there are various rights and obligations established which are enforceable against the parties.

In the direct contractual sense, therefore, any failure of ETSA Utilities to comply with the provisions of the connection and supply contract during the heatwave is a contractual matter between customers and ETSA Utilities.

The Commission notes that ETSA Utilities has put the view that, based on its legal advice, this is the only legal outcome from such a failure and that there are no associated regulatory outcomes.

The Commission cannot agree with such a non-purposive interpretation of the Electricity Distribution Code and the licence requirements. As noted above, clause 6(1)(d) of the distribution licence held by ETSA Utilities requires it to *"comply with the requirements of the Electricity Distribution Code relating to the standard connection and supply contract for all customers*". This includes the requirement of clause 1.1.1(a)(ii) of Part A of that Code that, except in certain circumstances where alternative arrangements are in place, ETSA Utilities must not supply electricity to a customer other than in accordance with the terms and conditions of that contract. In this context, a failure by ETSA Utilities to comply with the contractual provisions of the connection and supply contract during the heatwave is also a regulatory compliance issue, insofar as it would not have complied with the terms of clause 1.1.1(a)(ii).

As a result, the Commission is of the view that it must, pursuant to the Terms of Reference, have regard to whether there were any such failures and, if so, consider what might arise from such failures in a regulatory sense.

The starting point for this consideration is obviously the provisions of the Part B contract. The Commission has carefully reviewed that document and has formed the view that the provision which is of relevance in this case is the service standard contained within clause 5.3(d) dealing with the "Guaranteed Service Level" payments.

Clause 5.3(d), which was introduced by the Commission as a part of the service standard framework for ETSA Utilities, provides for payments to be made by ETSA Utilities to individual customers that experience reliability performance worse than pre-defined threshold levels (the "Guaranteed Service Levels", or "GSL"). In particular, clause 5.3(d) provides:

> *(d) Minimise frequency and duration of supply interruptions*
>
> *We will do our best to minimise the frequency and duration of supply interruptions to your supply address. We will make payments to you in accordance with the following tables if the frequency of interruptions or the duration of any single interruption exceed the thresholds set out in the same tables,*

Table 11.1 -Thresholds and payment amounts – frequency of interruptions

	THRESHOLD 1	THRESHOLD 2	THRESHOLD 3
NO. OF INTERRUPTIONS IN A REGULATORY YEAR ENDING 30 JUNE	>9 and ≤12	>12 and ≤15	>15
PAYMENT	$80	$120	$160

Table 11.2 - Thresholds and payment amounts –duration

	THRESHOLD 1	THRESHOLD 2	THRESHOLD 3
DURATION (HRS)	>12 and ≤15	>15 and ≤18	>18
PAYMENT	$80	$120	$160

Notes: *Payments in relation to the frequency of interruptions will be made in the quarter directly following the regulatory year (ending 30 June). Payments in relation to the duration of interruptions will be made within 3 months of the event occurring. Payments will be made in respect of the **supply address**, not the customer.*

The above scheme excludes:

- *interruptions caused by the following:*
  - *transmission and generation failures;*
  - *disconnection required in an emergency situation (eg. Bushfire);*
  - *single customer faults; and*
- *interruptions of a duration less than 30 seconds.*

Such outage duration GSL payments are required to be made by ETSA Utilities within 3 months of the event that gave rise to the obligation to make such payments. In this case, the clause requires that a customer entitled to a payment should have received the payment by no later than 22 April 2006.

Given the duration of the outages identified during the heatwave and the numbers of customers affected, it is clear that ETSA Utilities was liable under clause 5.3(d) to make GSL payments. The Commission's understanding, based on information provided by ETSA Utilities during the course of the Inquiry, is that ETSA Utilities has to date made 4,057 outage duration GSL payments to South Australians to a total amount of $535,360.

The Commission further understands that, based on the information provided by ETSA Utilities, of the entitled customers only some 2,600 had received outage duration GSL payments within the mandated three-month period.

Accordingly, around 35% of the customers entitled to an outage duration GSL payment had payments owing to them as at 23 April.

The failure to make these outage duration GSL payments within the mandated timeframe is not acceptable. It is the Commission's determination, based on the information presently available to it, that this represents a failure to comply with the terms of the relevant customers' connection and supply contracts by ETSA Utilities and is therefore also a failure to comply with the requirements of clause 6(1)(d) of the distribution licence.

While the Commission has recognised that there may be some development and teething issues associated with any new system, it expected that the experience ETSA Utilities gained from the August 2005 storms would have been sufficient to address such issues.

Two matters arise from this. The first relates to the necessary implication that systems and processes employed by ETSA Utilities in complying with the requirements of

clause 5.3(d) appear to be deficient. The second relates to the regulatory actions to be taken by the Commission in response.

The systems and processes matter, while arising squarely as a result of ETSA Utilities' performance in relation to outage duration GSL payments associated with the heatwave, is already under active consideration by the Commission. As a part of its ongoing compliance processes (as established under Energy Industry Guideline Number 4), the Commission undertakes periodic audits of licensees' systems to gain assurance that those systems appropriately reflect regulatory requirements.

The Commission has already determined that it will audit ETSA Utilities' compliance with its GSL payment obligations (both frequency and outage payments) during 2006, with the understanding that the audit findings, if unsatisfactory, will lead to changes being implemented by ETSA Utilities in its systems and processes. To ensure that this is achieved, the compliance process includes a follow-up audit on the areas that were the subject of the unsatisfactory audit findings.

It is the Commission's conclusion that this process, which has already been embarked upon, is an appropriate means for assessing ETSA Utilities' payment systems and processes in the context of its failure to pay around 35% of outage duration GSL payments within the three-month period.

11.3.3 Electricity Distribution Price Determination

As has been discussed at various stages throughout this Inquiry Report, the EDPD establishes a pricing methodology by which ETSA Utilities is permitted to recover the costs of providing distribution services. Embedded within the EDPD are assumptions as to the level of distribution service that will be delivered. For example, ETSA Utilities, when delivering connection services and network services (which form part of the overall category of distribution services, as defined in Chapter 5 of Part B of the EDPD) must do so using good electricity industry practice and in accordance with the requirements of the NER, the Electricity Distribution Code, the Electricity Metering Code and any other applicable laws.

Clause 28 of the electricity distribution licence requires ETSA Utilities to comply with the provisions of the EDPD. There is, therefore, a clear regulatory expectation arising from the EDPD that ETSA Utilities will comply with the good electricity industry practice standards of the NER.

As has been described elsewhere in this report, however, while the Commission has expressed a view that there is some doubt that ETSA Utilities' information management performance was consistent with a good electricity industry practice standard at the time of the heatwave, it has not formed any conclusion that ETSA Utilities has failed to comply with any obligations in this area.

11.4 Amendments to regulatory obligations

The Commission established a comprehensive service standard framework for ETSA Utilities in April 2005 to apply for the period July 2005 to June 2010. Some aspects of this framework, for example, the "best endeavours" annual service standards for reliability and telephone responsiveness, cannot easily be applied to a consideration of performance during extreme events. On the other hand, other aspects such as the GSL payment scheme do have direct application to such events.

The robustness of this framework has been tested by extreme weather events on at least 2 occasions since its commencement in July 2005; during the storms of late August 2005 as well as the January 2006 heatwave. While these events revealed certain inadequacies in the manner in which ETSA Utilities has sought to maintain appropriate levels of reliability and customer service performance during extreme weather events, the Commission does not believe that this requires major changes to the service standard framework.

As outlined in the Commission's Statement of Reasons for the EDPD, the Commission believes that the framework provides appropriate incentives (including financial penalties) to ensure that ETSA Utilities is motivated to redress poor performance. In addition, the Commission notes that ETSA Utilities has been funded under the EDPD to provide the level of service implicit in the framework. Nevertheless, the Commission concludes that certain changes to the framework would be appropriate to ensure that it better addresses some of the concerns revealed during the heatwave. Its conclusions are detailed below.

11.4.1 Maximum outage GSL payments

As noted earlier in this Chapter, Term of Reference 3.5 requires the Commission to consider whether the payments available under the GSL scheme should be increased to provide increased incentives for ETSA Utilities to meet determined levels of reliability.

The current maximum GSL payment for outage duration is set at $160 for an outage of greater than 18 hours. The Commission notes that during the heatwave, about 560 customers were without electricity supply for at least 24 hours. This was an unacceptable situation, as acknowledged by ETSA Utilities.

The Commission has concluded that the GSL scheme provides significant incentive to ETSA Utilities to change its supply restoration practices to reduce the level of payments it is required to make under the scheme. Nevertheless, it also considers it appropriate that a further band be added to the scheme, where an outage exceeds 24 hours, such that a payment of $320 will apply in those cases. The Commission is therefore recommending that, following the conclusion of this Inquiry, a consultative process under the ESC Act be commenced with a view to including this new band within Part B of the Electricity Distribution Code.

The intention behind this proposal is that it will provide an additional financial incentive for ETSA Utilities to ensure that the restoration times of the heatwave are not repeated; whether in future extreme weather events or in general restoration practices.

The Commission is therefore recommending that an additional threshold be established for outage duration GSL payments, such that a payment of $320 will be made to any customer affected by an outage of greater than 24 hours duration (that is, an additional $160 amount on top of the existing $160 entitlement for outages of 18 of more hours duration) as shown in Table 11.3 below.

Table 11.3:Proposed new outage duration GSL thresholds and payment amounts

	THRESHOLD 1	THRESHOLD 2	THRESHOLD 3 (NEW UPPER LIMIT)	THRESHOLD 4 (NEW)
DURATION (HRS)	>12 and ≤15	>15 and ≤18	>18 and ≤24	>24
PAYMENT PER EVENT	$80	$120	$160	$320 (existing $160 for >18 hours plus new $160 amount)

ETSA Utilities has made submissions to the Commission that this recommendation is not warranted on the basis that the South Australian regime is already the most onerous in Australia. Further, ETSA Utilities has argued that the introduction of an "*additional payment of $320*" would cost it approximately $500,000 per annum and, on that basis, it would seek an adjustment to be made to distribution tariffs to recover that amount from South Australian customers.[229]

Neither of these arguments persuades the Commission.

In relation to the first argument, the Commission does not consider that the South Australian regime is more "onerous" than regimes in other jurisdictions but, even if that were the case (which has not been proven by ETSA Utilities), the nature of the South Australian regime is already reflected within the regulatory pricing bargain struck through the EDPD, with allowances made for GSL payments within that pricing regime.

In relation to the alleged $500,000 per annum cost pass-through issue, the Commission does not accept ETSA Utilities' assertions.

For the total amount of this additional payment to be $500,000 per annum, 3,125 of ETSA Utilities' customers would have to experience outages of more than 24 hours' duration in each year. The Commission finds this outcome highly implausible, particularly given that only 564 customers were without power for more than 24 hours during the heatwave, which ETSA Utilities itself has argued was the most severe heatwave in 63 years.

[229] ETSA Utilities, *Submission to Heatwave – Draft Inquiry Report*, July 2006, pp7-8.

Further, ETSA Utilities has also argued that, as a result of its performance during the heatwave, it intends to implement a new regime whereby it will amend its Maximum Restoration Time Policy so as to prioritise the restoration of customers to ensure reconnection within an acceptable time:

> *A revised prioritisation system has been implemented to escalate response solutions for small numbers of customers who potentially could be without supply for more than 10 hours or experienced multiple outages during a single event.*[230]

It is reasonable to that expect the likely incidence of outages of greater than 24 hours to decrease rather than increase into the future given ETSA Utilities' stated intention to implement this policy. On balance, the Commission prefers the view that ETSA Utilities will successfully implement the policy with a corresponding reduction in the incidence of lengthy outages.

11.4.2 Additional telephone responsiveness standards

It is the Commission's conclusion that the length of average wait times for those customers wishing to talk to an operator during the heatwave were inappropriate. It is inevitable that wait times will increase during such extreme events and it may be difficult to prescribe an appropriate value for this measure during an extreme event. However, it may be possible to establish an additional *annual* standard relating to the average wait time for callers wishing to talk to an operator.

It may also be appropriate to establish minimum levels of service to be met by ETSA Utilities for the call centre IVR system, to be applied during extreme weather events for reliable reporting of outages (as discussed in Chapter 8).

The Commission considers that any such changes would be best done through clause 1.2.2 of the Electricity Distribution Code. For example, an amendment to that clause which provided some further direction as to the need for reliable reporting of outages and their repair and the need to update information provided to customers as soon as new or improved information is obtained by ETSA Utilities, is considered to be appropriate in the light of poor information provision during the heatwave.

The Commission is therefore recommending that, following the conclusion of this Inquiry, a consultative process under the ESC Act be commenced with a view to including a new call centre IVR system service standard in the Electricity Distribution Code.

11.4.3 Overload calls

As noted previously, based on the findings of this Inquiry Report, it will be necessary for ETSA Utilities to commence the regular reporting of the occurrence of "overload"

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[230] ETSA Utilities, March 2006, *Submission to ESCOSA' Issues Paper dated February 2006: "ETSA Utilities' Network Performance and Customer Service Response January 2006",* page 6.

calls (that is, customer calls that were not able to get through to the call centre). This obligation will be imposed on ETSA Utilities to ensure that the Commission is able to monitor the level of such calls and hence obtain a more complete view of call centre performance.

11.5 Conclusions

The Inquiry Terms of Reference require the Commission to consider ETSA Utilities' compliance with its regulatory obligations during the heatwave (clause 3.2) and to make recommendations with regard to any changes that could be made to the regulatory framework to better protect South Australian consumer interests (clause 3.6), including appropriate incentives and penalties (clause 3.3).

The Commission has reached the following conclusions with respect to these matters:

- In failing to make all of the required outage duration Guaranteed Service Level payments to customers entitled to receive them within the prescribed three-month period, ETSA Utilities has, on the facts before the Inquiry, failed to comply with the requirements of the Electricity Distribution Code. As a result, it also failed to comply with the requirements of clause 6(1)(d) of its electricity distribution licence. The Commission has reached the conclusion that the appropriate means of dealing with this matter is through a comprehensive audit of ETSA Utilities' Guaranteed Service Level payment systems and processes, which is currently in progress.
- ETSA Utilities met good electricity industry practice in network management and resource management, although both ETSA Utilities and the Commission have identified opportunities for improvement in those areas.
- There is some doubt that ETSA Utilities' information management performance was consistent with a good electricity industry practice standard at the time of the heatwave.
- While the GSL scheme provides significant incentive to ETSA Utilities to change its supply restoration practices to reduce the level of payments it is required to make under the scheme, it is appropriate that a further band be added to the scheme to provide an additional financial incentive for ETSA Utilities to ensure that the restoration times of the heatwave are not repeated; whether in future extreme weather events or in general restoration practices.
- Consideration will be given to establishing additional telephone responsiveness standards, such as an additional annual standard relating to the average wait time for callers wishing to talk to an operator.
- ETSA Utilities will be required to report on the number of overload calls (that is, customer calls not able to get through to the call centre), commencing no later than the September 2006 regulatory reporting quarter.

The Minister for Energy, in a submission to the Commission, called on it to consider whether legal action such as prosecution under the Electricity Act is warranted in relation to any failure by ETSA Utilities to comply with its regulatory obligations.[231]

The Commission has given careful consideration to this submission. In doing so it has had regard to generally accepted legal and public policy principles as to the manner in which a body such as the Commission should exercise its prosecutorial discretion.

> *A prosecution should not proceed if there is no reasonable prospect of a conviction being secured. This basic criterion is the cornerstone of the uniform prosecution policy adopted in Australia.*
>
> *The decision whether or not to prosecute is the most important step in the prosecution process. In every case great care must be taken in the interests of the victim, the suspected offender and the community at large to ensure that the right decision is made. A wrong decision to prosecute or, conversely, a wrong decision not to prosecute, tends to undermine the confidence of the community in the criminal justice system.*
>
> *It has never been the rule in this country that suspected criminal offences must automatically be the subject of prosecution. A significant consideration is whether the prosecution is in the public interest. The resources available for prosecution action are finite and should not be wasted pursuing inappropriate cases, a corollary of which is that the available resources are employed to pursue those cases worthy of prosecution.*[232]

Having regard to principles such as these, and based on legal advice it has received, the Commission is of the view that further legal action, in the nature of a prosecution under the Electricity Act is, first, not warranted in this case having regard to all of the facts and, secondly, unlikely to succeed in any event.

Not only would little public benefit, by way of improved service levels, accrue from legal pursuit of any breach but, further, the punitive effect of any such legal action would provide no discernable additional community benefit over and above the more than $1 million financial penalty which ETSA Utilities has already been required to pay to South Australians as a result of the regulatory regime imposed by the Commission.

In terms of the likely success of legal action, were the Commission to seek to prosecute ETSA Utilities for its actions during the heatwave, it would need (at law) to prove not only that a breach occurred but also that ETSA Utilities intended to breach (or was reckless as to the fact that it might breach) that regulatory obligation. The Commission has no evidence before it at all to suggest that this might have been the case for any obligation which it has considered.

Further, section 92 of the Electricity Act provides that it is a statutory defence to a charge of an offence against that Act if the defendant proves that the offence was not committed intentionally and did not result from any failure on the part of the defendant to take reasonable care to avoid the commission of the offence.

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231 Minister for Energy, submission to Draft Inquiry Report, July 2006, page 1.

232 Office of the Director of Public Prosecutions, Prosecution Policy and Guidelines, http://www.dpp.sa.gov.au/03/prosecution_policy_guidelines.pdf, accessed 17 August 2006.

The Commission has therefore concluded that there are no grounds for it to consider taking any legal action against ETSA Utilities as a result of the Commission's conclusions and recommendations as set out in this Inquiry Report.

11.6 Recommendations

Commission's Recommendations: Regulatory Obligations

Consideration will be given (through a consultative process under the Essential Services Commission Act 2002) to amending the Electricity Distribution Code to include:

- ***an additional threshold for outage duration Guaranteed Service Level payments, such that a payment of $320 will be made to any customer affected by an outage of greater than 24 hours duration (the current maximum is $160 for an outage of more than 18 hours' duration);***
- ***additional telephone responsiveness standards, such as an additional annual standard relating to the average wait time for callers wishing to talk to an operator;***
- ***minimum levels of service to be met by ETSA Utilities for the call centre Interactive Voice Recognition system, to be applied during extreme weather events;***
- ***a requirement to report on the number of overload calls (that is, customer calls not able to get through to the call centre), commencing no later than the September 2006 regulatory reporting quarter.***

12 NEXT STEPS

The next steps which the Commission intends to take in the coming months to assist ETSA Utilities to achieve better performance in supplying electricity to South Australians in the event of a future extreme weather event, are detailed below.

- ETSA Utilities will be required, pursuant to clause 15(1)(b) of its electricity distribution licence, to provide the Commission with a report by 30 November 2006, addressing separately each of the Commission's conclusions and recommendations. The report must identify:
  - the particular conclusion or recommendation;
  - ETSA Utilities' response to the conclusion or recommendation;
  - the action ETSA Utilities has taken in relation to the conclusion or recommendation (including timelines and expected outcomes) or, if no action has yet been taken, what actions ETSA Utilities intends to take (including timelines and expected outcomes).
- The Commission will develop and implement an audit and review program (in addition to audit work already being undertaken on ETSA Utilities' reporting systems, including the Guaranteed Service Level Payment system) to obtain assurance that ETSA Utilities' systems and processes are improved in relation to key areas identified in this Inquiry Report. In particular, the audit program will include, but not be limited to:
  - ETSA Utilities' information management processes;
  - the implementation and operations of the Outage Management System;
  - ETSA Utilities' summer preparations processes; and
  - the implementation of remedial or improvement actions identified by ETSA Utilities, both to date (as outlined in this Inquiry Report) and in the future (as identified in the report to be provided to the Commission by 30 November 2006).
- The Commission will embark on a public consultation process under the Essential Services Commission Act 2002, with a view to amending the Electricity Distribution Code in a number of important areas where shortcomings have been identified through this Inquiry process.

Details of each of these areas of work will be publicly notified and made available from the Commission's website.[233] All stakeholders with an interest in these areas are encouraged to participate or provide comment on those processes, with a view to maximising the benefits to South Australian electricity consumers.

[233] www.escosa.sa.gov.au.