
2004-2005

NEW SOUTH WALES

**Electricity Network
Performance Report**

TransGrid

INTRODUCTION

This Network Performance Report has been prepared by TransGrid to fulfil the requirements of the Electricity Network Operator reporting regime and the Electricity Supply (Safety and Network Management) Regulation 2002. The enactment of Electricity Supply (Safety and Network Management) Regulation 2002 has superseded the Electricity Supply (Safety Plans) Regulation 1997.

Clause 7(5) of the Regulation specifically excludes the requirement for TransGrid to lodge a Customer Installation Safety Plan.

This report has been independently appraised in accordance with the requirements of the DEUS Report Outline. The Appraisal Report confirmed that this Report is complete and that the data presented can be relied upon by the Department for carrying out performance analysis.

1. PROFILE

TransGrid is the owner, operator and manager of the high voltage transmission capability between generators, distributors and directly connected end users in New South Wales as well as interconnections with Queensland and Victoria. The system is a major part of one of the most extensive systems in the world comprising of 82 substations and power station switchyards and over 12,400 kilometres of transmission lines.

The system operates at voltage levels of 500, 330, 220 and 132kV. The substations are located on land owned by TransGrid and the transmission lines of steel tower, concrete or wood pole construction are generally constructed on easements acquired across private or public land.

TransGrid has staff strategically based at locations throughout NSW in order to meet the day to day operation and maintenance requirements as well as being able to provide emergency response. The main administrative office is located at the corner of Park and Elizabeth Street Sydney. Field staff are co-ordinated from major depots located at the Metropolitan Centre in Western Sydney and at Newcastle, Tamworth, Orange, Wagga Wagga and Yass.

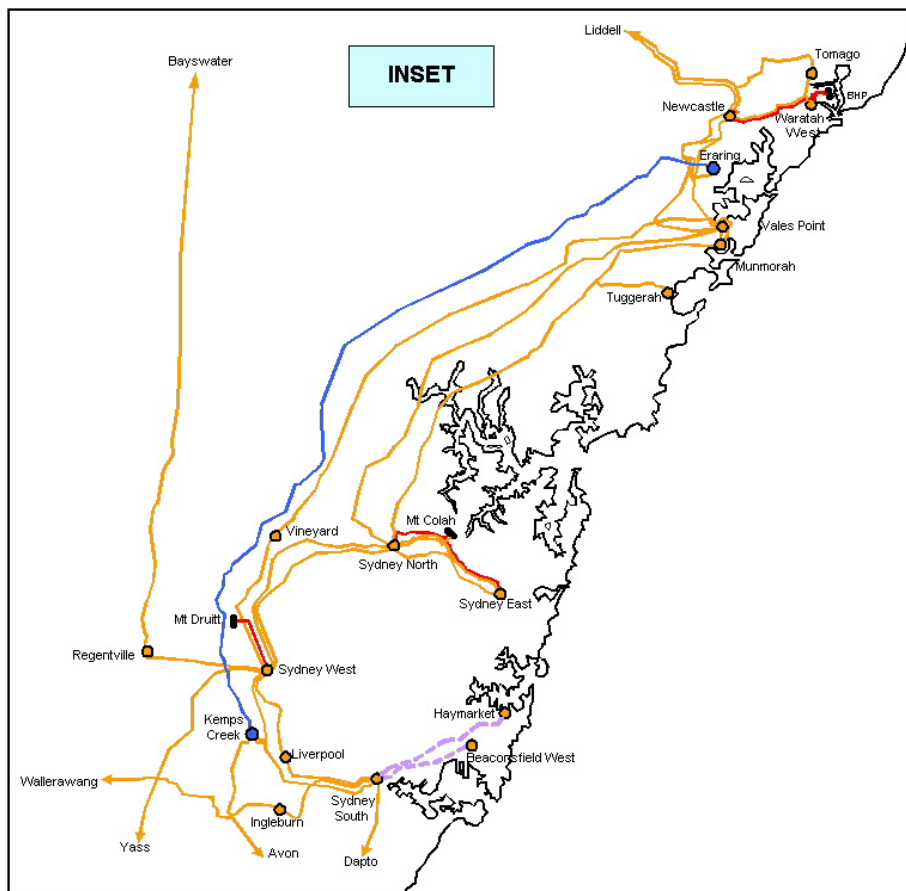
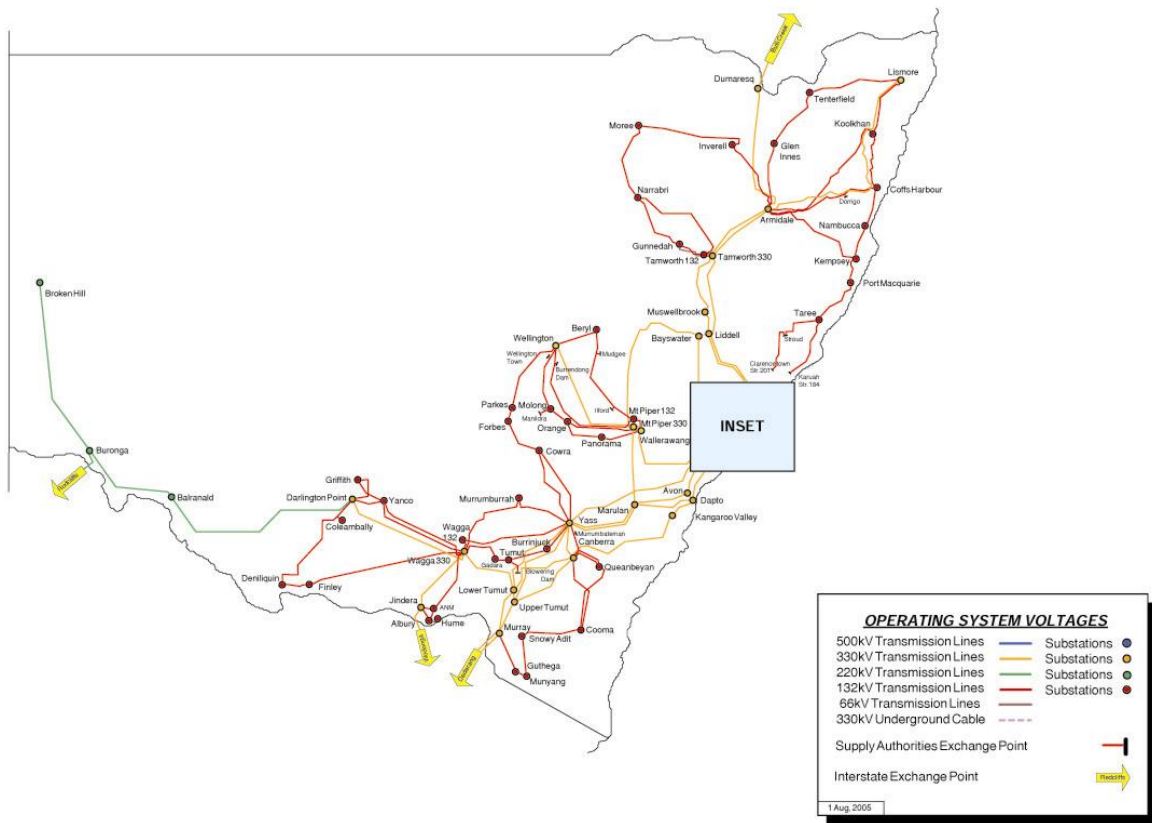
	Number at 30-6-04	Number at 30-6-05
Customer Numbers at Year End (Total)	14	14
Maximum Demand	12,476	13,126
Energy Delivered to Year End GWh	71,571	72,496
System Loss Factor (%)	3%	2.8%
Transmission System (km)	12,446	12,485
High Voltage Overhead (km)	12,426	12,438
High Voltage Underground (km)	20	47
Substations (Number). Note 2	82	82
Employees (Full Time Equivalent Number). Note 3	974	961
Contractors (Full Time Equivalent Number)	89	71

Notes: 1. Distances for overhead and underground lines are circuit km.

2. No. reported in 2004 report was 81. Haymarket S/S, which was commissioned at the 132kV busbar before 30 June 2004, was later counted in the Annual Report as a commissioned sub, making 82 substations.

3. Number averaged over the year.

NETWORK SYSTEM



2. NETWORK MANAGEMENT

2.1 Overview

TransGrid's mission is to be Australia's leading manager of network assets. It is committed to providing a safe working environment and ensuring the reliability of its electricity transmission network.

TransGrid published its updated (5 year) Network Management Plan 2001-2006 in May 2002. This Plan provides a focus for ongoing analysis within TransGrid aimed at continually improving the management of the transmission system while also providing an authoritative vehicle for dissemination of information to TransGrid's managers, employees, customers and stakeholders.

TransGrid also produced its 30 Year Plan in July 2000, covering the period from 2001 to 2030. The 30 Year and 5 Year Plans quantify TransGrid's medium and long term strategies for asset management and provide expenditure budget forecasts.

Ongoing management strategies aimed at the achievement of TransGrid's mission are the maintenance and development of Asset Maintenance Policies and Strategies in the framework of an accredited Quality Documentation system, a system of Quarterly Asset Performance Reviews, regular Technical Performance Assessments and audits, and extensive benchmarking studies.

In accordance with the Electricity Supply (Safety and Network Management) Regulation 2002, TransGrid prepared and lodged a Public Electrical Safety Awareness Plan on 30th June 2003 and lodged its Network Management Plan and Bush Fire Risk Management Plan on 29th August 2003.

Subsequently, independent audits of the Network Management and Bush Fire Risk Management Plans were conducted and Audit Reports were lodged on 31st October 2003.

2.2 Network Complaints

TransGrid has an established process of contacting all property owners before entering their property to perform any type of work in maintaining transmission lines, easements and access tracks and to fully explain the nature of work to be done, so that all property owners' concerns may be addressed prior to commencement. During the year, each of TransGrid's Regions receives a number of calls from property owners relating to this work. Most of these calls are enquiries about activities about to take place and are satisfied by information supplied by TransGrid's officers. However, some required further discussion with property owners to clarify the situation and sometimes to provide rectifying actions. In its three Regions for 2004/2005, only three notable verbal or written expressions of dissatisfaction were received. These are shown as two complaints relating to maintenance staff entering properties, and one complaint relating to damage of a fence during vegetation management and subsequent release of horses.

In addition, TransGrid received one complaint arising from transformer noise. This related to Vales Point 330kV switching station Tie Transformer. This is a new complaint about a situation TransGrid has already acted upon from a complaint in a previous year. Based on the original complaint an EPA Prevention Notice has been issued to TransGrid to carry out, inter alia, a noise impact assessment of the premises including modeling of noise emissions of the proposed new transformers and submit to EPA by 1/7/05. TransGrid submitted the report by the due date and is awaiting a response from the EPA. This new complaint is shown in Table 2.2 under 'Noise and Interference'.

Also, there was one (1) complaint regarding noisy neighbourhood parties, with large open fires, being held on TransGrid's easement near a major substation. This has been addressed with appropriate communications to the whole neighbourhood, including the complainant. This is shown in Table 2.1 under 'Complaints in relation to other issues: Note 2b)'.

Also, there was one claim made as a consequence of interrupted supply which was caused by TransGrid. This was the result of a delivery of a large load on TransGrid's site bringing down a local 415V overhead wire. This is shown in Table 2.2 under 'Reliability'.

Also, there were two complaints (but in parallel from two stakeholders on the same issue) about an incident at Yass where SCADA to a customer and NEMMCO was lost as a result of rodent damage to a fibre optic cable. This is shown in Table 2.1 under 'Complaints in relation to other issues: Note 2c)'.

There was one further complaint by a potential supplier over perceived preferential treatment given another supplier. This was resolved after correspondence between TransGrid and the complainant. This is shown in Table 2.1 under 'Complaints in relation to other issues: Note 2a)'.

The above easement maintenance complaints, noise and interference complaints, supplier complaint and loss of supply complaint are summarized in the following tables.

Performance Data

Table 2.1 - Network Complaints: Total Received 2004/2005	
Total Complaints Received	9
Distribution Customer Numbers (Averaged over the year)	N/A
Complaints Received per 1,000 Distribution Customers (averaged over the year)	N/A
Vegetation Management Program: % of Network where Clearing Carried Out ¹	10.3%
Number of Complaints in Relation to Vegetation and access track Management Activities	1
Number of Complaints in Relation to non-approved entry to property	2
Number of Complaints in Relation to other issues ²	4

- Note:
1. This value relates to easements with vegetation management requirements. Scheduled easement maintenance was 100% complete and mainly on spans with dense vegetation.
 2. Other issues relate to:
 - a) A potential service supplier over perceived preferential treatment given another supplier.
 - b) Noisy neighbourhood parties, with large open fires, being held on TransGrid's easement near a major substation.
 - c) Loss of SCADA from Yass substation (two complaints on same issue).

Category	Nature of Complaint	Total Number	% Valid ¹	% of Sub-Total
Voltage	Sustained over voltage			
	Sustained under voltage			
	Voltage fluctuations			
	Voltage dips			
	Switching transients			
	N-E voltage difference			
	Ground fault voltage			
	Voltage unbalance			
	Mains signalling voltages (Outside defined range)			
	HV injection (HV/LV Intermix)			
	Notching			
	Invalid			
	SUB TOTAL (Supply Voltage Complaints)			100
Current	Direct current			
	Harmonic content			
	Inter Harmonics			
	Invalid			
		SUB TOTAL (Supply Current Complaints)		
Other Quality	Mains signalling reliability			
	Noise & Interference	1	100	100
	Level of supply capacity			
	Supply frequency			
	Level of EMF			
	Invalid			
	SUB TOTAL (Other Quality of Supply Complaints)	1	100	100

	SUB TOTAL (All Quality of Supply Complaints)			
Reliability	No. of supply failures (No. of claims)	1	1	100
	Duration of supply failures			
	No. of <1 min. interruptions			
	Invalid			
	SUB TOTAL (Reliability of Supply)	1	100	100
Safety	Overhead line safety			
	Underground safety			
	Electrical station safety			
	Service line safety			
	Invalid			
	SUB TOTAL (Network Safety)			100
	TOTAL		100	N/A

Note 1: A complaint is valid where non-compliance with published service and network standards occurs.

Note 2: Table 2.2 does not include the 7 vegetation and other issues related complaints in Table 2.1.

2.3 Accredited Service Provider Scheme

Not Applicable

3. NETWORK PLANNING

3.1 Overview

TransGrid is responsible for the planning and development of transmission networks in New South Wales in two interrelated roles.

Firstly it has been nominated by the NSW Minister for Energy to be the Jurisdictional Planning Body (JPB) for NSW. In this role it:

- Represents the NSW Jurisdiction on NEMMCO's Inter-regional Planning Committee (IRPC);
- Provides jurisdictional information to the IRPC to enable it to assist NEMMCO in producing its annual Statement of Opportunities (SOO) and Annual National Transmission Statement (ANTS); and
- Carries out an Annual Planning Review, prepares an Annual Planning Report (APR) for NSW and reports to the Minister on matters arising from the Annual Planning Review, the SOO and ANTS.

Secondly it is registered with NEMMCO as a Transmission Network Service Provider (TNSP) in the NSW region of the National Electricity Market (NEM). As a TNSP the National Electricity Code (the Code) requires TransGrid to:

- Analyse the future operation of its transmission network to determine the extent of any future network constraints;
- Conduct annual planning reviews with Distributors to determine the extent of any emerging constraints at points of connection between the TNSP's network and the Distributor's network and determine options for the relief of constraints;
- Coordinate a consultative process for consideration and economic analysis of network augmentation options in accordance with the ACCC's Regulatory Test and determine the recommended option;
- After resolution of any disputes concerning the recommended option arrange for its implementation in a timely manner; and
- Prepare and publish an Annual Planning Report for NSW by June 30 of each year.

The Code requires the Annual Planning Report to include:

- Load forecasts;
- Results of annual planning reviews with Distributors;
- Planning proposals for future connection points;
- Forecast of constraints over 1, 3 and 5 years;
- Summary information for proposed augmentations; and
- Consultation reports on proposed new small network assets (NSNA).

These obligations are described more fully in Chapter 5.6 of the Code and the ACCC's Regulatory Test.

- In 2004, in accordance with a directive from the Ministerial Council on Energy, the Annual Planning Report's structure was aligned with the structure of the ANTS and Annual Planning Reports in other NEM Jurisdictions. Thus in addition to the above the APR contains a Summary of Relevant Major National Flow Path Developments.

To meet these obligations, TransGrid incorporates appropriate elements of the New South Wales Government's Total Asset Management (TAM) System regarding inter-agency plans and strategic planning (refer to Sections 3.3 and 3.5 of this report), service delivery strategy (refer to Section 3.2 of this report) and assessment and Decision Tools (refer to Section 3.4 – Demand Management – of this report.)

3.2 Reliability Planning Standards

Under NSW legislation TransGrid has responsibilities that include planning for future NSW transmission needs, including interconnection with other networks.

In addition, as a TNSP TransGrid is obliged to meet the requirements of Schedule 5.1 of the Code. In particular, TransGrid is obliged to meet the requirements of clause S 5.1.2.1:

“Network Service Providers must plan, design, maintain and operate their transmission networks ... to allow the transfer of power from generating units to Customers with all facilities or equipment associated with the power system in service and may be required by a Code Participant under a connection agreement to continue to allow the transfer of power with certain facilities or plant associated with the power system out of service, whether or not accompanied by the occurrence of certain faults (called “credible contingency events”).

The Code also sets out the required processes for developing networks as well as minimum performance requirements of the network in a range of areas including:

- A definition of the minimum level of credible contingency events to be considered;
- The power transfer capability during the most critical single element outage. This can range from zero in the case of a single element supply to a portion of the normal power transfer capability;
- Frequency variations;
- Magnitude of power frequency voltages;
- Voltage fluctuations;
- Voltage harmonics;
- Voltage unbalance;
- Voltage stability;
- Synchronous stability;
- Damping of power system oscillations;
- Fault clearance times;
- The need for two independent high speed protection systems;
- Automatic reclosure of overhead transmission lines; and
- Rating of transmission lines and equipment.

TransGrid consults with Code Participants and interested parties during the planning process and in determining proposals for network augmentations.

TransGrid’s planning obligations are also interlinked with the licence obligations placed on Distribution Network Service Providers (DNSP) in NSW. TransGrid must ensure that the system is adequately planned to enable their licence requirements to be met.

In addition to meeting requirements imposed by the Code, environmental legislation and other statutory instruments, TransGrid is expected by the NSW jurisdiction to plan and develop its transmission network on an “n-1” basis. That is, unless specifically agreed otherwise by TransGrid and the affected distribution network owner or major directly connected end-use customer, there will be no inadvertent loss of load (other than load which is interruptible or dispatchable) following an outage of a single circuit (a line or a cable) or transformer, during periods of forecast high load.

In fulfilling this obligation, TransGrid must recognise specific customer requirements as well as NEMMCO’s role as system operator for the NEM. To accommodate this, the standard “n-1” approach can be modified in the following circumstances:

- Where agreed between TransGrid and a distribution network owner or major directly connected end-use customer, agreed levels of supply interruption can be accepted for particular single outages, before augmentation of the network is undertaken (for example radial supplies).

- Where requested by a distribution network owner or major directly connected end-use customer and agreed with TransGrid there will be no inadvertent loss of load (other than load which is interruptible or dispatchable) following an outage of a section of busbar or coincident outages of agreed combinations of two circuits, two transformers or a circuit and a transformer (for example supply to the inner metropolitan/CBD area).
- The main transmission network, which is operated by NEMMCO, should have sufficient capacity to accommodate NEMMCO's operating practices without inadvertent loss of load (other than load which is interruptible or dispatchable) or uneconomic constraints on the energy market. At present NEMMCO's operational practices include the re-dispatch of generation and ancillary services following a first contingency, such that within 30 minutes the system will again be "secure" in anticipation of the next critical credible contingency.

These jurisdictional requirements and other obligations require the following to be observed in planning:

- At all times:
 - Electrical and thermal ratings of equipment will not be exceeded;
 - Stable control of system voltage will be maintained, with system voltages maintained within acceptable levels; and
 - Synchronous stability of the interconnected power system will be maintained.
- A quality of electricity supply at least to Code requirements is to be provided;
- A standard of connection to individual customers determined by Connection Agreements is to be provided;
- As far as possible, connection of a customer is to have no adverse effect on other connected customers;
- Environmental constraints are to be satisfied;
- Acceptable safety standards are to be maintained; and
- The power system in NSW is to be developed at the lowest cost possible whilst meeting the constraints imposed by the above factors.

Consistent with a responsible approach to the environment, it is also aimed to reduce system energy losses where economic.

A further consideration is the provision of sufficient capability in the system to allow components to be maintained in accordance with TransGrid's asset management strategies.

3.3 Levels of Network Planning

The network planning process is undertaken at three levels:

1. Connection Planning

Connection planning is concerned with the local network directly related to the connection of loads and generators. Connection planning typically includes connection enquiries and the formulation of draft connection agreements leading to a preliminary review of the capability of connections. Further discussions are held with specific customers where there is a need for augmentation or for provision of new connection points.

2. Network Planning within the New South Wales Region

The main 500 kV, 330 kV and 220 kV transmission system is developed in response to the overall load growth and generation requirements and may be influenced by interstate interconnection power transfers. Development includes negotiation with affected NSW and interstate parties.

The assessment of the adequacy of 132 kV systems requires joint planning with DNSPs. This ensures that development proposals are optimal with respect to both TransGrid and DNSP requirements leading to the lowest possible cost of transmission to the end customer. This is

particularly important where the DNSP's network operates in parallel with the Transmission network, forming a meshed system.

3. Inter-regional Planning

The development of interconnectors between regions, and of augmentations within regions that have a material effect on inter-regional power transfer capability are coordinated, under the National Electricity Code, by the Inter-regional Planning Committee convened by NEMMCO. Network Service Providers may also apply to NEMMCO for interconnection works to be classified as regulated.

The IRPC conducts an annual planning review of inter-regional networks, and assists NEMMCO in preparing the annual SOO and ANTS. The ANTS identifies actual and potential constraints on major national transmission flow paths that may be addressed by transmission augmentations, generation developments or demand management developments. A timetable for addressing inter-regional constraints follows from this work.

3.4 Demand Management

TransGrid treats non-network options, including demand management (DM) options, on an equal footing with network options. Thus consideration of DM options is fully integrated onto TransGrid's network planning processes.

DM options are implemented by third parties who have the relevant expertise and resources. Thus, for a demand management option to be implemented to meet a network constraint it must, in addition to passing the ACCC's Regulatory Test, have a proponent who is committed to implement the option and to accept the associated risks, responsibilities and accountabilities.

At this point in time it is expected that DM options will emerge either from joint planning with distributors, Electricity Market participants or other interested parties. Reasonable DM options may include, but are not limited to, combinations of the following:

- Reduction in electrical energy consumption through increases, at points of end-use, of:
 - Improved energy efficiency devices and systems;
 - Thermal insulation;
 - Renewable energy sources such as solar; and
 - Alternative reticulated energy sources such as natural gas.
- Reduction in peak electricity consumption through increases, at points of end-use, of:
 - Tariff incentives;
 - Load interruption and reduction incentives;
 - Energy storage systems;
 - Standby generators; and
 - Power factor correction equipment.

TransGrid actively promotes DM options through:

- Identifying opportunities for DM options through joint planning with the Distributors and engaging expert external consultants.
- Informing the market of constraints via its Annual Planning Report and consultations for alleviating individual constraints.
- Participating in the review of the Demand Management Code of Practice for Electricity Distributors in NSW.
- Participation in initiatives and reviews by the Department of Energy and Utilities and Sustainability (DEUS) and IPART that include consideration of demand management and its relationship to the development of electricity networks.

- Joint sponsorship of projects including the installation of Pacific Solar's Crystalline Silicon on Glass photovoltaic system located at the Powerhouse Museum in Sydney.

TransGrid's joint planning with the NSW distributors provides a mechanism to identify opportunities for DM options. NSW distributors follow a similar process to TransGrid in preparing planning reports for their networks, thereby providing another useful source of information for proponents of DM options. They also follow a Demand Management Code of practice that details the steps to be followed in considering and implementing DM options in distribution planning.

An example of the outcomes of these activities is as follows.

As part of the joint planning for electricity supply to the Sydney CBD and inner suburbs, TransGrid, Energy Australia and the Department of Infrastructure Planning and Natural Resources (DIPNR) have initiated and are currently conducting a high priority project to implement a Demand Management strategy to identify opportunities to reduce demand growth that may defer or avoid network expansion in the greater Sydney area. The project covers investigations and identification of feasible demand management and local generation opportunities. TransGrid and Energy Australia are supporting the project by committing a total of \$10 million towards implementation by contributing \$1 million per year each over a five-year period. The Department of Utilities and Sustainability (DEUS) has joined the project in November 2004.

As of June 2005 a number of projects are in progress and some are complete. These include opportunities for demand reduction and energy efficiency initiatives in the St George and Sutherland area of Sydney (125 sites have been investigated), assessment of opportunities to reduce demand for electricity through power factor correction in the inner metropolitan Sydney region (2,233 sites reviewed), Photo-Voltaic (PV) system output monitoring in Sydney's suburb of Newington (70% complete). During the 2004/5 financial year approval was given to several innovation projects and one of these, using ice storage technology, has been installed on commercial premises as an option to replacing the existing air conditioning system. A number of projects under the Heat, Ventilation and Air Conditioning (HVAC) have been approved and will be implemented during 2005/06. Also, a study of about 350 sites in the Sydney CBD covering investigations to identify opportunities for load reduction, is planned to start this year.

3.5 2004/2005 Results and Outcomes

3.5.1 Planning Processes

Joint Planning Meetings with Distributors

TransGrid held joint planning meetings with all five distributors during the year to 30th June 2005.

Annual Planning Review

An Annual Planning Review for 2005 has been carried out. It included:

- An update of TransGrid's load forecast that takes account of winter 2004 peak loads.
- Provision of load forecast data for inclusion in NEMMCO's 2005 Statement of Opportunities and Annual National Transmission Statement that will be published in October 2005.
- Publication of an Annual Planning Report for 2005 on 28th June 2005.
- A public forum for the Annual Planning Report was held on 3rd August 2005.

Interconnectors

NEMMCO applied the regulatory test and determined that SNI passed the regulatory test in December 2001. This decision was appealed before the National Electricity Tribunal, which rejected the appeal in October 2002. The Tribunal's decision was appealed in the Supreme Court of Victoria in November 2002. Hearings were completed in June 2003 with a decision handed down on 24th July 2003 upholding the appeal.

TransGrid has been re-evaluating the SNI Project in light of these and other changes in the NEM and has decided not to proceed with the SNI project. NEMMCO, ESIPC and ElectraNet SA have been advised of this decision.

TransGrid, in conjunction with Powerlink Queensland, carried out a major review of possible upgrade options for the Queensland – NSW interconnector, which was completed early in 2004. The review concluded that high capacity upgrades were unlikely to pass the regulatory test but that a low capacity upgrade may do so. Subsequent to the 2004 work TransGrid and Powerlink have identified a low capacity upgrade that they consider satisfies the regulatory test. This upgrade entails the installation of power flow control equipment on the Armidale – Kempsey 132 kV line.

Also under active consideration is a more substantial upgrade of QNI that could provide up to 150 MW additional NSW import capability. This upgrade would involve the installation of line series compensation in QNI and possibly upgrading of a critical 330 kV line between Tamworth and Armidale.

Load Forecast Summary

TransGrid's load energy and demand projections for NSW in aggregate are based on econometric modelling. These projections are supported by individual customer connection point forecasts, based on data provided by the Distributors.

The 2005 medium scenario projects an average increase per annum over the next ten years in:

- Energy sent out of 1,460 GWh (1.9 per cent);
- Summer peak demand of 400 MW (2.7 per cent); and
- Winter peak demand of 310 MW (2.1 per cent).

The following charts show the various scenarios for energy and summer and winter demand, where the medium, high and low scenarios mainly depict varying rates of economic growth. Actual summer and winter demands in these charts have also been weather-corrected to produce Standard Weather Peak Demand (SWPD). The standard weather adopted is that which is expected to produce a peak demand that has a 50 per cent probability of exceedence (POE). The demand projections are then based on the actual SWPD series.

Figure 3.1: NSW Energy Sent Out

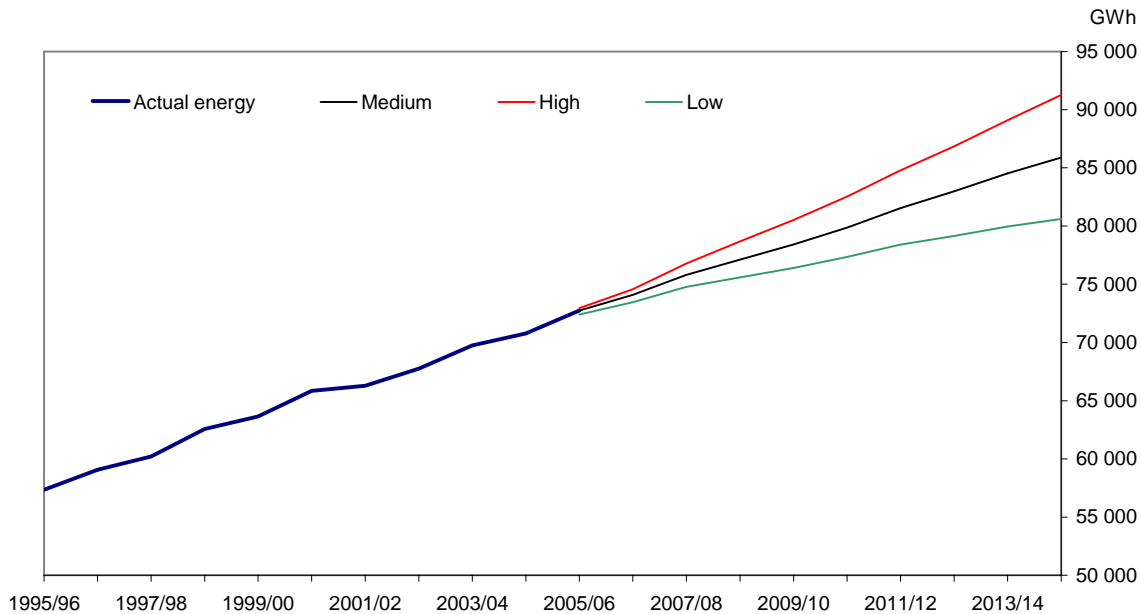


Figure 3.2: NSW Summer Peak Demand 50% PoE

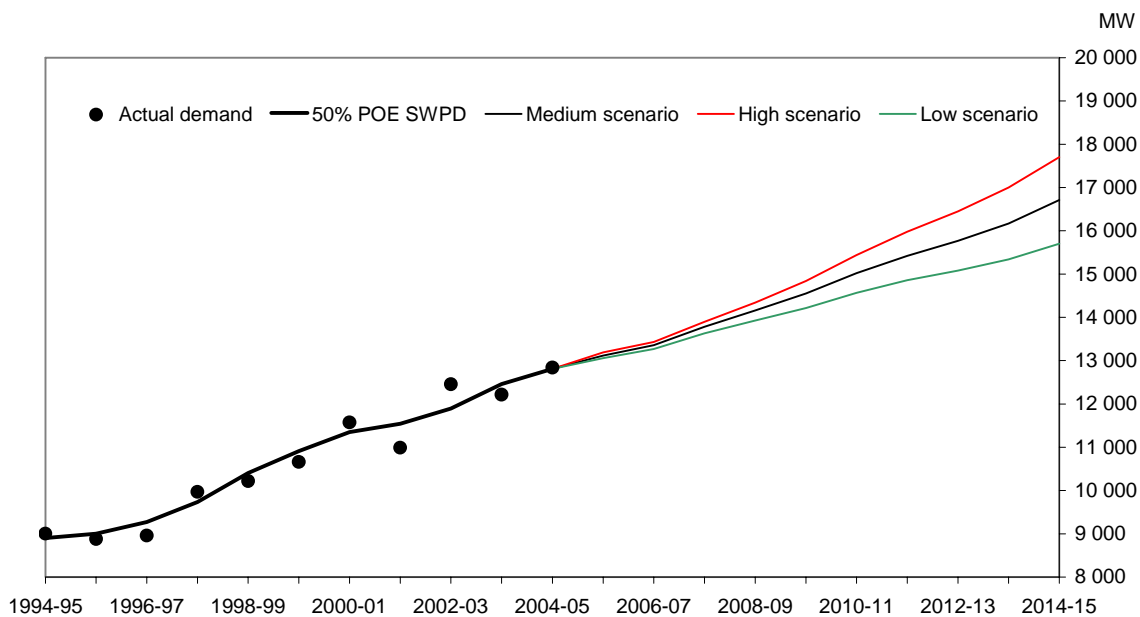
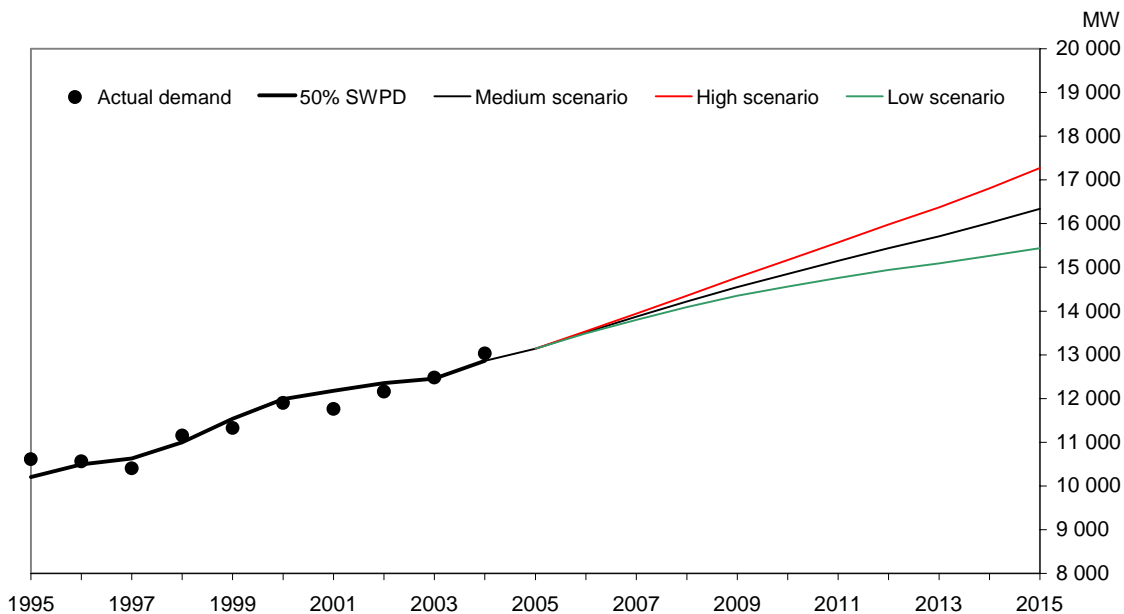


Figure 3.3: NSW Winter Peak Demand 50% PoE



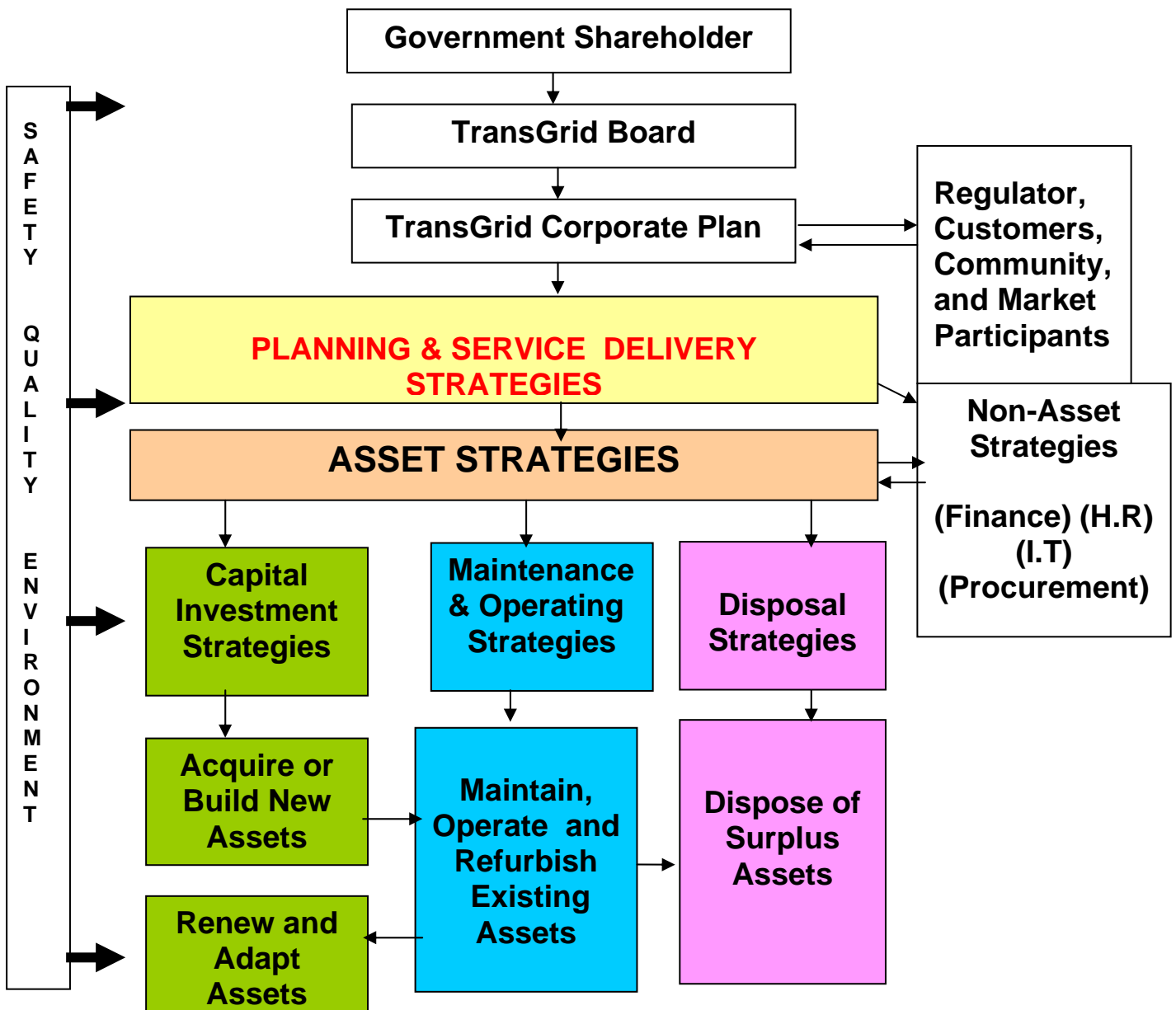
Comparing actual summer peak demands with the following winter peak demands, NSW has always been winter peaking. However, with summer peak demand growing at a faster rate than winter peak demand, it is only a matter of time before NSW generally experiences a summer peak. Recent actual demands for summer and winter have been quite close and the projections show an increasing likelihood each succeeding year of a summer, rather than winter, peak.

4. ASSET MANAGEMENT

4.1 Overview

TransGrid is constantly striving to optimise its asset management performance as a means of achieving its corporate mission “To be Australia’s leading manager of network assets” and meeting its customers’ expectations of system reliability and quality of supply. This involves the development, maintenance and ongoing review of Asset Management Policies and Strategies for the maintenance, refurbishment and replacement of the full range of network assets.

To accomplish this mission, TransGrid has developed an Asset Management model that is based on the New South Wales Government’s Total Asset Management (TAM) Model as promulgated in 2001. TransGrid’s model is shown in the figure below.



As a service delivery utility, TransGrid’s approach is to apply the various elements of the TAM model, including strategies for Planning & Service Delivery, Assets, Capital Investment, Asset Maintenance and Asset Disposal, as well as the recommended implementation Plans for HR, IT, Procurement and the legislative, community and stakeholder forms of direction. In addition, TransGrid strives to meet its

service delivery obligations as seen by its external Regulator in the form of Reliability and Availability while also meeting its corporate and community commitments to safety, the environment and quality.

To support this objective, TransGrid has initiated or maintained a number of strategies during the year.

- The review of maintenance policies to implement the outcomes of Risk Management principles, identifying the criticality, reliability, risks and exposures associated with particular courses of action.
- Achievement of a consistently high standard of asset maintenance is facilitated by TransGrid's continued certification to ISO 9001 of its Quality Documentation system. Despite the large geographical distances between Regions and their assets, there is confidence in the effective application of identical policies across the network.
- Quarterly Asset Performance Reviews are conducted by maintenance, operating, asset management and design staff to specifically review the performance of the network assets during the previous three months. This involves the detailed analysis of all forced and emergency outages during the period, as well as a review of the long term availability and reliability trends to determine any issues requiring further investigation. Review meetings were held on August 2004, November 2004, March 2005 and May 2005.
- Technical Performance Assessments are carried out bi-annually on each Region to audit the technical standard and completeness of the maintenance performance. Independent internal auditors with specialist knowledge of the maintenance functions for different asset types conduct these assessments. A formal report detailing observations and business risks is prepared, with a follow-up process to ensure that any issues identified are effectively addressed. During the year, assessments were conducted at Northern Region/Tamworth (November 2004), Central Region/Orange (March 2005) and Southern Region/Yass (May 2005.)
- TransGrid's maintenance performance in the Australasian and International sphere is monitored through its regular participation in a number of benchmarking studies. ITOMS (International Transmission Operations & Maintenance Study) is organised by a steering committee representing twenty six transmission organisations from Australasia, Europe, United Kingdom and United States and managed by the consulting group UMS. It compares at a detailed level the comparative costs of individual maintenance functions and their associated outage service levels. The results of these studies continue to provide insights into other best performer organisations' work practices. This information is fed back into TransGrid's reviews of its own practices and policies, completing the self-improvement cycle of asset management. During the year, TransGrid committed to participate in the ITOMS 2005 study for analysis of performance during the year 2004/2005.

These and other asset management strategies which meet the TAM model are described in detail in TransGrid's Network Management Plan, contained in the document Network Management Plan 2001 – 2006 as follows: Planning and Service Delivery (Section 3.), Asset Strategies (Section 4.), including Capital Investment Strategies (Section 4.1), Asset Maintenance and Operating Strategies (Section 4.2) and Asset Disposal Strategies (Section 4.4).

4.2 Technical Service Standards

TransGrid's prime service standards of customer focused network performance are those of Reliability and Availability.

4.2.1 Reliability

Reliability is a measure of the service level of the transmission network as perceived by the customer. It relates to the amount of Energy Not Supplied resulting from a temporary failure of a component of the network. The measure used to describe Reliability is System Minutes. This is the equivalent of how many minutes the total Network, while delivering the annual maximum MW demand, would have to be out of service to equate to the amount of Energy Not Supplied during the year.

For the past period 1999-2004 the ACCC set a Reliability target of between 0.5 and 2.0 System Minutes per annum, with a 3 year rolling average target of 1.3 system minutes. For the new revenue reset period of 2005-2009, commencing July 2004, the ACCC has set reliability targets on a statistical basis of the number of incidents with ENS exceeding 0.05 but less than 0.4 system minutes (5 off) and the number exceeding 0.4 system minutes (1 off). These targets involve penalties and incentives.

4.2.2 Availability

Availability is a measure of the network's transmission circuits preparedness to transmit energy to and from customers. It relates to the total duration of transmission circuit outages compared to the total possible hours available for all circuits. It indicates the effectiveness of strategies to minimise the number and duration of planned maintenance outages and the success of maintenance policies in reducing unplanned circuit outages.

Availability is measured as a percentage of the ideal (but unrealistic) no outages situation. An availability target for the high voltage transmission network of 99.5% was set during the recent ACCC review for the period from 2005 – 2009, involving penalties or incentives

4.2.3 Connection Point Performance

In addition to Reliability and Availability, TransGrid measures its network performance at the individual customer Connection Point level. TransGrid's total connection points are spread across 14 connected customers, 10 being Distributor/Direct customers, and 4 Generator customers. The numbers of connection points per customer range from as few as 1 to as many as 181. The measures reported are the Connection Point Unplanned Interruption (with loss of supply) frequency, duration and restoration time, for each individual customer and an average across the network for the Distributor/Direct customers.

Historically, TransGrid has not recorded details of planned outages that result in unsupplied energy. Contributing to this has been the difficulty in judging what constitutes loss of supply. In many instances, due to forward planning, the customer is able to arrange alternative sources of supply by switching in back-feed circuits or use of alternative local generation. Subsequently, the customer was not without supply.

In many other cases, the TransGrid planned outage is coordinated with a customer's scheduled major maintenance involving a shut down of all plant. Often, the outage planned by TransGrid is coordinated with a distributor to allow them to perform outstanding maintenance work, both benefiting from the outage.

4.2.4 Quality of Supply

TransGrid addresses its obligations to quality of supply in a manner as set out in Section 3.2 (Reliability Planning Standards) of this report and as required by Schedules S5.1a and S5.1 of the National Electricity Code covering, inter-alia:

- Frequency and Frequency Variations
- System stability
- Power frequency voltage
- Voltage fluctuations
- Voltage waveform distortion
- Voltage unbalance
- Protection systems and fault clearance times

4.3 Actionable Asset Incidents – SENI-2 Scheme

A summary of Actionable Asset Incident reports is provided in Table 4.1, with the incident date, brief description, location, network element affected and any action proposed or undertaken if necessary to prevent re-occurrence.

Date	Description	Location	Network Element Affected
6/12/04	Category a) A single phase unit (No.7) of No.2 330/132kV Transformer failed in service, with resulting explosion and fire.	Yass 330/132kV Substation	The only remaining transformers and bushings of this type are located at Yass 330/132/66kV Substation. Until the planned decommissioning of these transformers in June 2005 the following regular inspections and testing have been initiated: (a) thermovision of transformers and bushings, and; (b) DDF testing of the bushings

4.4 Transmission Performance Data

2004/2005 performance for Reliability and Availability experienced no significant impact from the inclusion of the transferred Snowy Hydro transmission assets. There were no reliability impacting outages involving the ex-Snowy Hydro assets. Though there were a small number of planned and forced outages on the ex-Snowy Hydro assets, their overall impact on TransGrid's availability measure was not significant.

4.4.1 Reliability

For the year 2004/2005, TransGrid experienced 8 Energy not Supplied outages totalling 0.152 system minutes. When converted to a percentage of energy delivered, 0.152 system minutes equates to a reliability exceeding 99.9999%. There was only one (1) incident with ENS greater than 0.05 system minutes, and no incidents with ENS > 0.4 system minutes.

4.4.2 Availability

For the year 2004/2005, TransGrid achieved an availability of 99.59%. This represents the availability of TransGrid's transmission lines at all voltages from 132kV up to 500kV.

4.4.3 Connection Point Performance

Of TransGrid's 14 connected customers, 11 did not experience any unplanned outages causing loss of supply or interruption to generation. Two (2) distribution customers experienced loss of supply from unplanned outages. These were Australian Inland, and Country Energy. One (1) Generator experienced interruption to generation. This was Snowy Hydro Authority.

The data provided in this section is determined in accordance with TransGrid's "Service Standards Reporting Policy – Attachment 1: Criteria for Inclusion and Exclusion of Outages for Performance Measures".

Network Reliability	Objective	00/01	01/02	02/03	03/04	04/05
System minutes	0.5 – 2.0	0.67	0.44	4.40	2.22	0.15

Circuit Availability	Objective	00/01	01/02	02/03	03/04	04/05
Percent	99.5	99.55	99.63	99.64	99.65	99.59

Table 4.13 – Connection Point Interruptions – Average 2004/2005		
	Objective	04/05 averaged across network
Connection point interruption frequency		0.036
Connection point interruption duration (minutes)		2.16
Restoration time (minutes)		59.92

Note: Indicator values in Table 4.13 are calculated only for Distributor/Direct Customers

Table 4.14 – Connection Point Interruptions (Unplanned) 2004/2005		
Connection Point	No. of Unplanned Interruptions 04/05	Total Duration of Interruptions 04/05(min)
Australian Inland		
Broken Hill 220/22kV S/S - 22kV Fdr No. 3 South	1	60
Broken Hill 220/22kV S/S - 22kV Fdr No. 4 Railway	1	60
Broken Hill 220/22kV S/S - 22kV Fdr No. 5 Talc St No.2	1	60
Country Energy		
Colleambally 132kV: Transformer No.1	1	7
Coffs Harbour 132/66kV: 702 Raleigh	1	46
Coffs Harbour 132/66kV: 703 Nana Glen	1	34
Coffs Harbour 132/66kV: 705 South Coffs Harbour	1	34
Griffith 132/33kV : 33kV No.2 Yenda	1	4
Murrumburrah 132/66kV: 66kV 836 Cootamundra	1	120 (Note 2)
Tamworth 132/66kV: 66kV 876 Kootingal	1	275
Wallerawang 132/66kV: 66kV 856 Oberon tee Lilyvale	1	9
Yanco 132/33/66kV : 33kV No.5 Whitton	1	10
Snowy Hydro Authority:		
Guthega P.S. : No.1 Generator Transformer	1	63
Guthega P.S. : No.2 Generator Transformer	1	63

Note 1: As explained in 4.2.3, this Table 4.14 lists only Unplanned interruptions.

Note 2: The duration and value of Energy Not Supplied for this outage (2 hours, 13.4MWh and 0.061 system minutes) was calculated based on 'system normal' response times in accordance with TransGrid's "Service Standards Reporting Policy – Attachment 1: Criteria for Inclusion and Exclusion of Outages for Performance Measures".

Table 4.15 – Averaged Individual Customer Connection Point Performance 2004/2005	
	04/05 Averaged Across Customer
Customer: ACTEWAGL	
Connection point interruption frequency	0
Connection point interruption duration (mins)	0
Restoration time (mins)	0

Customer: ANM	
Connection point interruption frequency	0
Connection point interruption duration (mins)	0
Restoration time (mins)	0
Customer: Australian Inland	
Connection point interruption frequency	0.27
Connection point interruption duration (mins)	16.4
Restoration time (mins)	60.0
Customer: Bluescope Steel	
Connection point interruption frequency	0
Connection point interruption duration (mins)	0
Restoration time (mins)	0
Customer: Country Energy	
Connection point interruption frequency	0.05
Connection point interruption duration (mins)	2.98
Restoration time (mins)	59.89
Customer: EnergyAustralia	
Connection point interruption frequency	0
Connection point interruption duration (mins)	0
Restoration time (mins)	0
Customer: Integral Energy	
Connection point interruption frequency	0
Connection point interruption duration (mins)	0
Restoration time (mins)	0
Customer: SRA	
Connection point interruption frequency	0
Connection point interruption duration (mins)	0
Restoration time (mins)	0
Customer: Tomago Aluminium	
Connection point interruption frequency	0
Connection point interruption duration (mins)	0
Restoration time (mins)	0
Customer: VISY	
Connection point interruption frequency	0
Connection point interruption duration (mins)	0
Restoration time (mins)	0
Customer: Delta (Generation)	
Connection point interruption frequency	0
Connection point interruption duration (mins)	0
Restoration time (mins)	0

Customer: Macquarie (Generation)	
Connection point interruption frequency	0
Connection point interruption duration (mins)	0
Restoration time (mins)	0
Customer: Eraring (Generation)	
Connection point interruption frequency	0
Connection point interruption duration (mins)	0
Restoration time (mins)	0
Snowy Hydro Authority	
Connection point interruption frequency	0.1
Connection point interruption duration (mins)	6.0
Restoration time (mins)	63.0

Note: The connection point performance values reported for Generator customers do not include interruptions to auxiliary supply connection points.

Table 4.16 - Connection Points Not Performing to Objective 2004/2005	
Connection Point	Commentary
	See Notes

Notes: Objectives were not set for 2004/2005 as the transmission network has relatively few incidents and as such a measure from any individual connection point is difficult to predict.

5. NETWORK SAFETY

5.1 Overview

TransGrid's goal is zero injuries, occupational illnesses and incidents. Our first priority is the health and safety of our people, our contractors, visitors and the public. Our strategies are aimed at continually improving our performance and maintaining a major focus on risk management.

The Executive Occupational Health and Safety Committee has responsibility for over-seeing the development and implementation of our corporate occupational health and safety policy and procedures and the promotion and monitoring of health and safety performance within TransGrid. This includes the establishment of a number of subcommittees to address specific areas of TransGrid's activities who report to the Executive OHS Committee on a quarterly basis. These committees include:

- Safety Rules
- High Voltage Safe Working Practices
- Fire Protection
- Electric & Magnetic Fields
- Clothing
- Safety Communications Steering

The Executive OHS Committee and other Senior Managers of TransGrid hold an annual workshop to review OHS objectives and strategies and determine the focus for the coming year. Three key objectives provided the foundation for the 2004 – 2005 business unit Health and Safety Plans which were to:

1. Reinforce and standardise Risk Management processes.
2. Reinforce and promote consultative mechanisms to improve health and safety communications.

3. Promote a healthy and safe working environment through the provision of targeted training and awareness programs.

Objectives 1 and 2 ensured continuity for a number of the strategies that were implemented during the 2003-2004 Plan. Objective 3 provided a focus for the issues identified and discussed during the workshop.

A system of compliance audits and inspections ensure that procedures are implemented in accordance with legislative and organisational requirements. These include OHS system audits, random, unannounced safety compliance inspections, site conformance inspections, contractor audits and team leader audits of pre work risk assessments.

Communication is an integral component of our health and safety system aimed at ensuring that everyone is aware of their responsibilities and role in the implementation of our strategies. OHS Audit reports provided by internal and external auditors reflect a strong OHS commitment, understanding and performance across TransGrid.

The Safety Communications Steering Committee assists with the review of policy and procedures through consultation with local committees and other relevant parties, and develops initiatives to promote health and safety to maintain a high level of awareness amongst staff. The specific initiatives for 2004-2005 focused on health and safety issues both on and off the job and included, winter working, holiday safety (don't leave safety at work), protect your senses, working hot (cool down and calm down, be seen - be safe, spring cleaning, diabetes, diet and exercise programs. Implementation strategies included presentations from guest speakers, health assessments, information kits, displays and demonstrations.

TransGrid takes an active role in a number of industry and WorkCover committees to ensure that trends and expectations of legislators, industry and the community are understood and managed effectively. Compliance to these requirements was demonstrated by nil infringements or prosecutions and the renewal of TransGrid's workers compensation self insurer licence for another three year period to 30 April 2007.

TransGrid also holds an annual Safety Day with Risk Assessment, First Aid and Fire Fighting competitions for teams representing all areas of TransGrid. In addition to these internal competitions, TransGrid also participates in the Electricity Supply Industry Field Days and the Power Industry Safety Day.

5.2 Electrical Network Accidents / Incidents Involving the Public

	00/01	01/02	02/03	03/04	04/05
Serious Electrical Accidents	0	0	0	0	0
Serious Electricity Network Accidents	0	0	0	0	0

Category of Accident	Fatal	Non-Fatal
Overhead Mains in Position		
Overhead Mains Fallen		
Overhead Service in Position		
Overhead Service Fallen		
Underground Mains		
Underground Service		
Street Light Fitting or Support		
Cable Boxes, Pillars and Service Cabinets		
Substation (Excluding Pole-type) – Fire and/or Explosion		
Substation (Excluding Pole-type) - Other		
Substation (Pole-type) - Fire and/or Explosion		

Substation (Pole-type) - Other		
Poles Columns or Towers		
Air Break Switches		
Pole Mounted Equipment (Reclosers, Drop Out Fuses, etc)		
Service Connection or Customer Switchboard		
Other (Describe below)		
Total	0	0

**Table 5.3 – Serious Electrical Accident (Public) Numbers for 2004/05
Classified by Equipment Items Involved in Overhead Line Contact**

Equipment Involved	Fatal	Non-Fatal
Trucks		
Cotton Module Makers		
Construction/Demolition Equipment		
Cranes		
Structures		
Grain Augers		
Harvesters		
Scaffolding		
Excavators		
Communication Cables		
Irrigation Pipes		
Tractor or Implement		
Removalist Van		
Aircraft		
Water Spray Equipment		
Yacht Masts		
High Loads		
Trees		
Other (describe below)		
Total	0	0

**Table 5.4 – Serious Electrical Accident (Public) Numbers for 2004/05
Classified by Cause**

Primary Cause of Accident	Fatal	Non-Fatal	Preventative Actions Taken or Planned
Lack of Awareness			
Network Design or Construction Defect (describe below)			
Failure to Obtain Plans or Locate Underground Cables at Work Site			
Low Conductor Height			
Pole Failure			
Cross-arm Failure			
Stay or Conductor Failure			
Neutral Connection Failure			
Insulation Failure (Describe below)			
Insulator/Fitting Failure (describe below)			
Natural Event or Site Conditions			
External Influence (Trees, Motor Vehicles etc)			

Vandalism / Unauthorised Access			
Unauthorised Access (Security Adequate)			
Other (describe below)			
Total	0	0	

Table 5.5 – Serious Electricity Network Accident (Public) Numbers for 2004/05			
Description	Fatal	Non-Fatal	Preventative Actions Taken or Planned
Total	0	0	

Actionable Safety Incidents involving Public

Table 5.6 – Actionable Safety Incidents (Public) Numbers for 2004/05 Classified by Network Element		
Category of Incident	Number	% of Total
Overhead Mains in Position		
Overhead Mains Fallen		
Overhead Service in Position		
Overhead Service Fallen		
Underground Mains		
Underground Service		
Street Light Fitting or Support		
Cable Boxes, Pillars and Service Cabinets		
Substation (Excluding Pole-type) – Fire and/or Explosion		
Substation (Excluding Pole-type) - Other		
Substation (Pole-type) - Fire and/or Explosion		
Substation (Pole-type) - Other		
Poles Columns or Towers		
Air Break Switches		
Pole Mounted Equipment (Reclosers, Drop Out Fuses, etc)		
Service Connection or Customer Switchboard		
Other (Describe below)		
Total	0	100%

Table 5.7 – Actionable Safety Incidents (Public) Numbers for 2004/05 Classified by Equipment Items in Overhead Line Contact		
Equipment Involved	Number	% of Total
Trucks		
Cotton Module Makers		
Construction/Demolition Equipment		
Cranes		
Structures		
Grain Augers		
Harvesters		
Scaffolding		
Excavators		
Communication Cables		
Irrigation Pipes		
Tractor or Implement		
Removalist Van		
Aircraft		
Water Spray Equipment		
Yacht Masts		
High Loads		
Trees		
Other (describe below)		
Total	0	100%

Table 5.8 – Actionable Safety Incidents (Public) Numbers for 2004/05 Classified by Cause			
Primary Cause of Incident	Number	% of Total	Preventative Actions Undertaken or Planned
Lack of Awareness			
Network Design or Construction Defect (describe below)			
Failure to Obtain Plans or Locate Underground Cables at Work Site			
Low Conductor Height			
Pole Failure			
Cross-arm Failure			
Stay or Conductor Failure			
Neutral Connection Failure			
Insulation Failure (Describe below)			
Insulator/Fitting Failure (describe below)			
Natural Event or Site Conditions			
External Influence (Trees, Motor Vehicles etc)			
Vandalism / Unauthorised Access			
Unauthorised Access (Security Adequate)			
Total	0	100%	

5.3 Electrical Network Accidents / Incidents Involving Network Workers

A summary of performance, trends, causes and preventative action implemented.

There was only one (1) Serious Electrical Accident (SEA) during the year. At Taree substation, during HV testing of a new but disconnected transformer, a testing contractor received a 24kV shock. He was admitted to hospital for observation and discharged after four hours with only minor injuries.

	00/01		01/02		02/03		03/04		04/05	
	SEA	SENA	SEA	SENA	SEA	SENA	SEA	SENA	SEA	SENA
Employees	0	0	0	0	0	0	0	0	0	0
Network Operator Contractors	0	0	0	0	0	0	0	0	1	0
Accredited Service Providers	0	0	0	0	0	0	0	0	0	0

Category of Accident	Employees		Network Contractors		Accredited Service Providers	
	Fatal	Non-Fatal	Fatal	Non-Fatal	Fatal	Non-Fatal
Overhead Mains in Position						
Overhead Mains Fallen						
Overhead Service in Position						
Overhead Service Fallen						
Underground Mains						
Underground Service						
Street Light Fitting or Support						
Cable Boxes, Pillars and Service Cabinets						
Substation (Excluding Pole-type) – Fire and/or Explosion						
Substation (Excluding Pole-type) - Other				1		
Substation (Pole-type) - Fire and/or Explosion						
Substation (Pole-type) - Other						
Poles Columns or Towers						
Air Break Switches						
Pole Mounted Equipment (Reclosers, Drop Out Fuses, etc)						
Service Connection or Customer Switchboard						
Other (Describe below)						
Total	0	0	0	1	0	0

Table 5.11 – Serious Electrical Accidents (Network Workers) Number for 2004/05 Classified by Cause							
Primary Cause of Accident	Employees		Network Contractors		Accredited Service Providers		Preventative Action Undertaken or Planned
	Fatal	Non-Fatal	Fatal	Non-Fatal	Fatal	Non-Fatal	
Lack of Awareness							
Network Design or Construction Defect (describe below)							
Failure to Obtain Plans or Locate Underground Cables at Work Site							
Low Conductor Height							
Pole Failure							
Cross-arm Failure							
Stay or Conductor Failure							
Neutral Connection Failure							
Insulation Failure (Describe below)							
Insulator/Fitting Failure (Describe below)							
Natural Event or Site Conditions							
External Influence (Trees, Motor Vehicles etc)							
Vandalism / Unauthorised Access							
Unauthorised Access (Security Adequate)							
Other (describe below) Failure to follow written procedure				1			Testing procedure has been reinforced to all testing technicians at a Team Meeting.
Total	0	0	0	1	0	0	

Note: At Taree substation, during HV testing of a new but disconnected transformer, a testing contractor received a 24kV shock when he failed to follow the "Down, Off & Earth" protocol before approaching the test equipment.

Table 5.12 – Serious Electricity Network Accident (Network Worker) Numbers for 2004/05			
Description	Fatal	Non-Fatal	Preventative Actions Taken or Planned
Total	0	0	

Actionable Safety Incidents (Network Workers)

One Actionable Safety Incidents is reported during 2004 – 2005, TransGrid takes a proactive approach to any safety issues or near miss incidents. All incidents are required to be reported and investigated.

Safety Alerts are issued for any relevant industry or internal safety incidents. A Health and Safety Notice Board is maintained on the intranet and staff are notified on a monthly basis of any additions posted during the previous month.

Table 5.13 - Actionable Safety Incidents (Network Workers) Numbers for 2004/05						
Classified by Network Element						
Category of Incident	Employees		Network Contractors		Accredited Service Providers	
	Number	% of Total	Number	% of Total	Number	% of Total
Overhead Mains in Position						
Overhead Mains Fallen						
Overhead Service in Position						
Overhead Service Fallen						
Underground Mains						
Underground Service						
Street Light Fitting or Support						
Cable Boxes, Pillars and Service Cabinets						
Substation (Excluding Pole-type) – Fire and/or Explosion	1	100				
Substation (Excluding Pole-type) - Other						
Substation (Pole-type) - Fire and/or Explosion						
Substation (Pole-type) - Other						
Poles Columns or Towers						
Air Break Switches						
Pole Mounted Equipment (Reclosers, Drop Out Fuses, etc)						
Service Connection or Customer Switchboard						
Other (Describe below)						
Total	1	100%	0	100%	0	100%

Table 5.14 - Actionable Safety Incidents (Network Workers) Numbers for 2004/05							
Classified by Cause							
Primary Cause of Incident	Employees		Network Contractors		Accredited Service Providers		Preventative Actions Undertaken or Planned
	Number	% of Total	Number	% of Total	Number	% of Total	
Lack of Awareness							
Network Design or Construction Defect (describe below)							
Failure to Obtain Plans or Locate Underground Cables at Work Site							
Low Conductor Height							
Pole Failure							
Cross-arm Failure							
Stay or Conductor Failure							
Neutral Connection Failure							
Insulation Failure (Describe below)	1	100					See Note below
Insulator/Fitting Failure (Describe below)							
Natural Event or Site Conditions							
External Influence (Trees, Motor Vehicles etc)							
Vandalism / Unauthorised Access							
Unauthorised Access (Security Adequate)							
Total	1	100%	0	100%	0	100%	

Note: At Bayswater switchyard, a 330kV CT failed explosively causing the trip of 330kV line No.34 from Bayswater to Liddell power stations. The explosion resulted in fire in the switchyard adjacent to the CT and in grassland outside the switchyard. Fractured porcelain spread from the CT for approximately 30m radius. Following this event, six NSW generating units tripped in quick succession, as well as two potlines, as a result of their respective automatic plant protection schemes not riding through the fault.

Following an investigation it was determined that all 330kV CTs of this contract be removed from service in the earliest practical timeframe. The investigation examined three 330kV CTs from this contract and found manufacturing quality issues of concern including significant inconsistencies in construction around the DDF connection. Although the cause of failure could not be definitively identified, the inconsistencies were of concern and the proposed action was deemed prudent.

Lost Time Injuries

There has been a decrease in both LTIs and Average Time Lost Rates from 2003-2004, this is in line with a continuing downward trend over the past five years.

All incidents are required to be reported (whether lost time or not) and thoroughly investigated by the team leader in conjunction with the injured employee (whenever possible). The investigation is to identify the root causes and develop corrective actions. Investigations of all LTIs are reviewed by the Executive OHS Committee at its quarterly meetings and by the Board on a monthly basis.

A statistical trend analysis was undertaken to determine any specific areas requiring attention. With the exception of manual handling, there were no definitive trends highlighted. Initiatives that promote a positive safety culture within TransGrid are continuing with a focus on the three key areas identified:

- i) risk management,
- ii) safety communications and consultation, and
- iii) training and awareness programs.

Measure	Employees	Network Contractors
Number of Workers (full-time equivalent) Note 1.	961	71
Number of Lost Time Injuries	4	4
Number of Days Lost	63	76
Lost Time Injury Frequency Rate (LTIFR)	2.1	28.0
Average Time Lost (ATL)	15.8	19.0

Note 1: Number averaged over the year.

	00/01	01/02	02/03	03/04	04/05
Employees	6.3	4.7	2.1	3.6	2.1
Electrical Network Contractors	N/A	4.7	0	16.9	28.0

Note: TransGrid's LTI rate decreased from 2003-04 continuing a downward trend. However, four LTIs were reported by contractors, an increase of one from 2003-04. Two of these involved easement clearance work, one resulting in a sprained ankle the other a broken hand. One involved strain to lower back during Fire Systems installation and one involved multiple injuries when a contractor slipped and fell down some stairs.

	00/01	01/02	02/03	03/04	04/05
Employees	10.9	9.7	7.3	18.6	15.8
Electrical Network Contractors	N/A	16	0	33.7	19.0

Note: Both TransGrid and the Contractors ATL decreased from 2003-04. Three of TransGrid's accidents involved sprains/strains resulting in 20 days lost time and one a torn bicep resulting 43 days lost time.

Two of the Contractors accidents involved sprains/strains resulting in 6 days lost time. The other two were as a result of a broken hand with a loss of 51 days and a fall down stairs with a loss of 19 days.

6. Customer Installations

- o **Not applicable to TransGrid.**

7. BUSH FIRE RISK MANAGEMENT

7.1 Bush Fire Risk Management Plan

TransGrid's Bush Fire Risk Management Plan (revision 3) is published on TransGrid's website. The previous revision of the plan was subject to external audit and found to comply with the requirements of the Electricity Supply (Safety and Network Management) Regulation 2002 in relation to TransGrid's transmission network assets. Some minor improvements to the plan recommended in the audit report have been included in the current revision (see section 7.3 below).

7.2 Bush Fire Risk Management Performance

7.2.1 Performance Indicators

TransGrid's network performed very well during the 2004-2005 reporting period, no bushfires were ignited by any of the high voltage assets. The following table summarises the performance outcomes, and compares these to the previous year's performance:

Indicator	2003-2004 Performance		2004-2005 Performance	
	Target	Actual	Target	Actual
Network Assets Inspected in Bush Fire Prone Areas	100 %	100 %	100 %	100 %
Outstanding Network Risk Defects in Bush Fire Prone Areas	Nil	Nil	Nil	Nil
Fires where it appears ignition may have been caused by network assets	Nil	Nil	Nil	Nil

7.2.2 Performance Reviews

Formal reviews are carried out for all major incidents involving Network assets. These reviews are conducted under terms of reference set by the relevant General Manager or the Executive.

TransGrid has carried out reviews of the major bush fire emergencies that have impacted the NSW network in the last decade. These reports are:

- "Review of System Operation and Performance during the N.S.W. Bush Fire Emergency January 1994".
- "Review of Network Performance During Bush Fires in December 2001 – January 2003.
- "Investigation into the Impact of Bush Fires on TransGrid's Network" 4th-6th December 2002.

These reports covered:

- An assessment of system plant and performance
- A review of operating practices, emergency response procedures, and design and maintenance standards; and
- The identification of strategies with respect to easement or site management to enhance reliability of the network in future or similar bush fires.

Generally the reports concluded that the network exhibited excellent performance during these emergencies. A number of improvements have been implemented as a result of these reviews, which will further enhance network reliability.

7.3 Audit Report Recommendations for the Bush Fire Risk Management Plan

The previous revision of the Bush Fire Risk Management Plan (Revision 2) was audited as requested by the Director-General of the Ministry of Energy & Utilities (now known as DEUS – Department of Energy, Utilities & Sustainability) by Denhine Holdings Pty Ltd and was found to comply with the Regulation in relation to TransGrid's transmission network assets (Audit Certificate issued on 28th October 2003).

The report recommended that line TL 19 maintained under contract for Delta be included in standard GM AS L7 001 - Transmission Line Inspection Classifications. This line, and TL 81Y that is also maintained under contract for Delta have been included in the current revision of this document.

Other improvement suggestions contained within the report that have also been addressed include:

- The establishment of a strategy to progressively update warning signs on towers that refer to ECNSW to change the reference to TransGrid.
- Updated telephone book listings for TransGrid and to include cross-referencing to the name ECNSW.

7.4 Proactive Programs

TransGrid provides representation to Bush Fire Management Committees (BFMC) as detailed in Attachment 1 of the Bush Fire Risk Management Plan. At these meetings TransGrid provides advice on matters such as the impact proposed hazard reduction burns will have on TransGrid lines and recommendations are made on how to protect these assets prior to the commencement of a burn.

TransGrid has also provided advice to the relevant BFMCs that TransGrid easements can be maintained, particularly in NPWS and State Forest managed estates, in a manner such that they can be utilised as Strategic Fire Advantage Zones (SFAZ). Some easements are now being managed in cooperation with these agencies to provide these zones.

TransGrid is also participating with the NSW RFS and other authorities in a review of Bush Fire Management Committees (BFMC), their objectives and structure. An initial workshop was held at the RFS headquarters on 21st June 2005 attended by two TransGrid senior officers. The workshop resulted in draft purpose and objectives for BFMC and a scope of responsibilities for BFMC members.

8. PUBLIC ELECTRICAL SAFETY AWARENESS CAMPAIGN REPORT

TransGrid's Public Electrical Safety Awareness Plan is based on a risk assessment of public safety issues. The generic risk assessment process identified eight strategic areas for attention in the Plan:

1. Unauthorised access to substations
2. Unauthorised climbing of transmission towers
3. High machinery and extendable plant operating under transmission lines
4. Excavators and earth moving machinery in vicinity of high voltage cables
5. Kite flying and model planes in proximity to transmission lines
6. Fires under or in proximity to transmission lines
7. Crop dusting and aerial surveillance activities
8. Navigable waters under transmission lines

2004 – 2005 Plan

The Action Plan for 2004/2005 was developed for the implementation of specific actions arising from the PESA Plan 2004-2007.

The following three focus areas along with objectives and actions were identified in the Plan.

1. Relationship Management

Objective:

To effectively manage relationships with property owners, emergency services and construction contractors on issues relating to public electrical safety.

Property Owners:

- ♦ Liaison with property owners and contact details established.
- ♦ Information provided on electrical hazards and dangers associated with fire in proximity to overhead lines.
- ♦ Identification of service providers (eg. crop dusters, irrigation contractors etc) and provision of safety information.

Emergency Services:

- ♦ Familiarization of substations.
- ♦ Liaison with NSW Rural Fire Service regarding appropriate training and information on electrical safety with TransGrids assets.

Construction Contractors:

- ♦ Regional service established to respond to enquiries.

2. Site Specific Issues

Objective:

To identify issues of public electrical safety relating to specific substations, transmission lines and cables, and to develop appropriate actions to eliminate or control these issues.

Substations:

- ♦ Risk Assessments conducted to identify any exposure factors and sites requiring specific actions.
- ♦ Specific initiatives continued for identified sites with increased public electrical safety exposure (i.e. Liaison with schools and Kidsafe, provision of suitable brochures, upgrade perimeter fencing).

Transmission Lines:

- ♦ Reassessment of sites with exposure factors to identify any additional sites requiring specific actions.
- ♦ Specific initiatives continued for identified sites with increased public electrical safety exposure.

- ♦ Review conducted of MSB signs on navigable waters relating to overhead transmission lines and condition. For replacement/renew as required.
- ♦ Review conducted of kite flying and model plane signage in proximity to transmission lines.

Cables:

- ♦ Maintained inspection patrols for marker posts and gutter markers with TransGrid contact details.

3. Community Interaction

Objective:

To raise community awareness of electrical safety associated with TransGrid's assets and to ensure information on electrical safety is readily available when required.

- ♦ The development and implementation of education/information program for identified schools.
- ♦ Placement of over 25 advertisements on electrical safety in local newspapers.
- ♦ Responding to local issues, and seasonal activities.

The TransGrid Public Electrical Safety Awareness Plan was revised to cover a four year period from 2004 – 2007. An Action Plan is currently being developed to address issues identified as Priority 1 which are to commence and/or be completed during 2005 – 2006.