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SECURITY OF SUPPLY

PARTICIPANT OUTAGE PLAN

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Revision Register

Revision	Issued	Reason for Revision
0	December 2009	New Document
1	6 January 2010	Section 8.3 added. Extra sentence at end of 4.5 added. Section 4.6 amended.
2	2 February 2010	Sections 4.5 and 4.6 amended to clarify possible AUFLS modification by System Operator.
3	18 February 2010	Vector copyright statement amended.

1. General

1.1 Plan Review Period

The Service Delivery Group within Vector will review this plan at least annually or changes may be made at any time as a result of changing operating conditions or regulatory requirements.

1.2 Associated Documents

- ERS-001 Vector Major Incident Plan
- ERS-004 Vector Civil Defence and Emergency Management Plan
- EOS-019-019 Vector Emergency Load Shedding Strategy
- Vector Group Emergency Communication Plan
- Auckland Engineering Lifelines Group technical publication No 214 - Priority Infrastructure Sites and Routes
- Electricity Commission's Security of Supply Outage Plan (SOSOP)

1.3 Definitions

AUFLS	Automatic Under Frequency Load Shedding
The Commission (EC)	Electricity Commission
EGR	Electricity Governance Rules
Feeder	A high voltage supply line typically supplying between 100 and 2000 customers.
GEN	Grid Emergency Notice
GXP	Transpower Grid Exit Point
POP	Participant Outage Plan (this plan)
Regulations	Electricity Governance (Security of Supply) Regulations 2008
Rolling Outages or Rolling Cuts	Planned electricity disconnections spread over different parts of the network at differing times to avoid prolonged outages at any one location.
SCADA	System Control and Data Acquisition
SOSOP	Security of Supply Outage Plan (Electricity Commission)
Supply Shortage Declaration	Declaration made by the Electricity Commission under regulation 9
System Operator (SO)	Operator of the national electricity transmission grid

1.4 Purpose

New Zealand's electricity system depends on there being a sufficient supply of electricity to meet demand at all times in all areas of the country. Certain events could lead to a lack

of electricity supply, either nationally or in certain areas. The events include very low rainfall leading to low hydro lake levels, the failure of a major generation plant or a fault on a critical transmission circuit. These events happen very rarely. However, given the widespread disruption they could cause, it is prudent to plan for them. The EC has therefore introduced the Regulations to manage the supply and use of electricity at times of severe energy and/or capacity shortage. This management would take the form of enforced Rolling Outages implemented across New Zealand to reduce demand in order to meet the reduced supply of electricity.

Under the Regulations various electricity participants, including Vector are required to develop Participant Outage Plans (POP) to specify the actions that would be taken to:

- Reduce electricity consumption when requested by the Electricity Commission
- Comply with requirements of the Electricity Commission's Security of Supply Outage Plan (SOSOP)
- Comply with Electricity Governance (Security of Supply) Regulations 2008
- Supplement the Electricity Commission's Security of Supply Outage Plan

Rolling outages would be a last resort after all other options including voluntary savings have been exhausted. Vector will always endeavour to keep supply on to customers. Customers will be kept informed of events.

While this plan outlines Vector's planned response, a change in circumstances or network conditions may require Vector to adjust this plan to operating conditions at the time.

2. Background

2.1 Electricity Commission

The Electricity Commission is a Crown entity set up under the Electricity Act 1992 to oversee New Zealand's electricity industry and markets.

A function of the Electricity Commission under the Electricity Act is to use reasonable endeavours to ensure the security of electricity supply. The Commission's activities include forecasting supply and demand, developing and publishing guideline hydro levels for security of supply, contracting for reserve energy, and improving the ability of consumers to manage price risks in the market.

2.2 Transpower

Transpower is a State Owned Enterprise, tasked with owning and operating New Zealand's National Grid - the network of high voltage transmission lines and substations that transports bulk electricity from where it is generated to distribution line companies such as Vector.

As the System Operator, Transpower manages the real-time operation of New Zealand's electricity transmission system. It keeps the right amount of energy flowing to match supply with demand.

2.3 Vector

Vector electricity is the electricity network company that owns and maintains the electricity lines and cables that deliver electricity to the Auckland region between Wellsford and Papakura.

2.4 Supply and Demand

Transpower as the system operator controls the transmission network to match generation with customer demand. Constraints on the ability to manage this may be caused by:

- Insufficient generation
- Insufficient transmission capacity

Which can, for example, be caused by:

- Low lake levels reducing hydro generation
- Failure of a large generator
- Fault on critical transmission circuit

The first two causes above could lead to an energy shortage while the third could lead to a shortage of transmission capacity.

3. The Commission's Response to Security of Supply Emergencies

(The paragraphs in section 3 have been taken from the Electricity Commission's Security of Supply Outage Plan - October 2009)

3.1 Overview

The SOSOP outlines how the Commission intends to implement rolling outages as a last resort emergency measure. The Commission's Emergency Response Plan (ERP) specifies the actions the Commission would take in a shortage situation (such as commencing a national electricity conservation campaign or implementing rolling outages).

The ERP sets out that rolling outages would be considered as the last measure that could be triggered when hydro storage fell below the 'Emergency Storage Guideline', or when some other contingency increased the probability of shortages within a particular region to at least 10%.

Rolling outages would be implemented only after the Commission has assessed that it is more likely than not that a period of forced outages under Grid Emergency provisions would otherwise be required.

3.2 Staged approach

The ERP outlines four phases of response during a security of supply situation:

- a Security Normal Phase: Modelled risk of energy shortage is less than 1%. The Commission monitors and publishes regular forecasts of security levels in the form of assessments of hydro storage relative to Hydro Storage Guidelines.
- a Security Watch Phase: Modelled risk of energy shortage reaches 1%. The Commission increases the frequency of monitoring and publishes regular updates.
- a Security Alert Phase: Modelled risk of energy shortage reaches 4%. The Commission communicates with stakeholders, intensifies monitoring activity, and activates an emergency response structure (see paragraph 2.9 below);
- a Security Emergency Phase: Modelled risk of energy shortage reaches 10%, or asset outages create a similar risk of shortage. An emergency situation is declared. The

Commission communicates with stakeholders and oversees the implementation of emergency measures.

The rolling outages process outlined in the SOSOP would be a 'last resort' emergency measure during the Security Emergency Phase.

3.3 Rolling outages as a last resort

Regulation 9 states that the Commission may make a supply shortage declaration only if there is a shortage of electricity supply or transmission capacity such that:

- the Commission considers that the normal operation of the wholesale market is, or will soon be, unlikely to facilitate the adjustment of supply and demand necessary to ensure that supply matches demand; and
- if planned outages are not implemented, unplanned outages are likely.

The Regulations empower the Commission to make a supply shortage declaration as a last resort, to avoid or delay the need for the disconnection of demand under grid emergency provisions.

The disconnection of demand under grid emergency provisions would necessarily be based on limited information and would focus on achieving a supply-demand balance in the short term. Rolling outages under the Regulations should facilitate demand reductions on a more informed basis and could be implemented in a more managed way.

3.4 Emergency response structure

The ERP specifies the Commission's organisational structure during security of supply emergencies:

- an Operational Steering Group comprising Commissioners and senior Commission staff, to oversee the emergency response strategy, coordinate with Industry Representative Group(s), and make key decisions;
- an Emergency Response Project Manager, to report on security risks, make recommendations to the Operational Steering Group, and act as a point of coordination with industry participants regarding administrative and non-operational issues; and
- Industry Representative Group(s) – one or more groups of senior industry executives (including generator, retailer and distributor representatives) and consumer representatives.

The Operational Steering Group would be chaired by the Chair of the Commission, who would also act as spokesperson for the Commission on all security of supply matters.

The emergency response organisation structure would oversee and implement the process of coordinating rolling outages as a last resort in a security of supply emergency.

3.5 Communications

The Commission will work closely with the system operator in the lead up to, and during, rolling outages. Specified participants will receive and provide the following two types of communication required under the SOSOP:

- Administrative communications will be directly with the Commission; and
- Operational communications will be via the System Operator.

The role of the System Operator is detailed in section 3 of this SOSOP.

Administrative communications include the following:

- Any declaration of a supply shortage by the Commission;
- Any revocation of a supply shortage declaration by the Commission;
- Providing a participant outage plan to the Commission;
- Any notice to approve or to decline to approve a participant outage plan;
- Any advance notice of a possible declaration of a supply shortage or revocation of a supply shortage declaration;
- Reporting by participants on compliance with the Regulations and any directions received under the Regulations.

The Commission will provide all administrative communications required under the SOSOP using the contact details provided by participants under regulation 14(5).

Operational communications include:

- Any direction to implement rolling outages, including savings targets;
- Any advance notice of savings targets;
- Any information provided by participants on demand forecasts, the nature and extent of outages, and the level of electricity savings being experienced;
- Any process to restore load following rolling outages;
- Any information about the possible overlap between Grid Emergencies, automatic under-frequency load shedding (AUFLS) and the implementation of rolling outages.

The System Operator will provide all operational communications required under the SOSOP:

- using the same, or similar, communications system as that used by the System Operator to issue formal notices; and
- to the relevant asset owner points of contact, and to persons who receive instructions and formal notices as set out in technical code B of schedule C3 of part C of the Rules.

Under regulation 14(5), the Commission requires the following persons to provide their contact details:

- every electricity distributor (i.e. an electricity distribution business as defined in section 2(1) of the Electricity Act 1992) that takes electricity directly from the grid (this does not include Transpower and embedded networks);
- every person who uses electricity that is conveyed to that person directly from the grid, provided that person uses more than 80 GWh per annum according to the Commission's calculations.

4. General Principles

4.1 Range of Events

Events that could lead the Commission to make a supply shortage declaration can in general terms be categorized as:

- **Developing Event** – Events that evolve over time, for example low hydro lake levels.
- **Immediate Event** – Events that occur with little or no warning, usually as a result of a transmission line or major generation failure.

4.2 Major Incident

A **Developing Event** or an **Immediate Event** will be treated by Vector as a major incident as per Vector's Major Incident Plan ERS-001. The major incident team comprises senior Vector operational managers and asset specialists as required.

Communication with retailers, civil defence and other stakeholders will be as per normal notification procedures described in major incident plan. See also section 8.

4.3 Load Reduction by Vector

Vector has the ability to reduce load by turning off domestic water heaters. Water heating load reduction is only useful to reduce peak demand. It is of almost no value for energy saving because users simply transfer their energy usage to later in the day. Additional load reductions for response to immediate events, or effective load reductions for energy savings, would require disconnecting customers.

4.3.1 Automatic Reduction

4.3.1.1 Reserve Market

Generators with reserve capacity and users with interruptible load such as distribution networks, offer reserve capacity to the Instantaneous Reserves Market to cover the risk of the largest generating unit or a critical transmission line tripping. Vector offers its water heating load into the Reserve Market. Tripping of water heaters in this case is automatic in response to grid events.

Generally the water heaters are only turned off for a short duration and because of the inherent storage capacity of water heaters there is little or no effect to customers. Once spinning reserve generators take up load lost by the disconnected generator, the water heaters are gradually switched back on.

4.3.1.2 Disconnecting Customers Automatic Under Frequency Load Shedding (AUFLS)

If the load shed by the Reserve Market tripping is insufficient to stabilise the network or if the frequency falls below the reserve market threshold, further automatic load reduction is required.

Each distribution company including Vector is required, unless exempted to have available at all times two blocks of load (each comprising 16% of its total instantaneous load) to be shed by automatic under-frequency relays should an AUFLS event occur.

AUFLS Block 1

This will automatically disconnect a minimum of 16% of Vector's load by disconnecting customers' supply.

AUFLS Block 2

This will automatically disconnect a further 16% of Vector's load.

Note: a large drop in frequency may cause an AUFLS trip before the reserve market operates.

4.3.1.3 Manual Shedding

Under certain circumstances the System Operator may request Vector to manually shed load. Under the Electricity Governance Rules, Vector must comply with this request.

4.4 Criteria for Rolling Outages

To ensure public health and safety is preserved and costs to economy are minimised, the following table shows the desired criteria for selecting feeders to be included in rolling outages.

4.4.1 Table 1 Customer Priorities

Priority	Priority Concern	Maintain Supply to:
1	Public health and safety	Major hospitals, air traffic control centres, and emergency operation centres.
2	Important public services	Energy control centres, communication networks, water and sewage pumping, fuel delivery systems, major ports, and public passenger transport.
3	Public health and safety	Minor hospitals, medical centres, schools, and street lighting.
4	Food production	Dairy farms and milk production facilities.
5	Domestic production	Commercial and industrial premises.
6	Disruption to consumers	Residential premises.

These priorities as recommended by the Electricity Commission are intended as guidelines and, because rolling outages will be implemented on a feeder by feeder basis, it is not possible to discriminate between individual customers on the same feeder. For example, a predominantly residential feeder may also have small pockets of commercial or industrial customers.

4.5 AUFLS Criteria

The criteria shown in Table 1 are also used to select feeders for AUFLS tripping. As AUFLS load blocks are predominantly taken from category 6 priority in the table, there is little load left in this priority for rolling outages unless an AUFLS modification notice (section 4.6) is received from the System Operator. Without such a modification, category 5 and higher groups must be included in rolling outages. However as total load decreases during rolling outages, the amount of load required for AUFLS will also decrease and some feeders reserved for AUFLS blocks may be included in rolling outages.

4.6 AUFLS Modification

The System Operator may under section 6.5 of technical code B of schedule C3 of part C of the Electricity Governance Rules specify modifications to the AUFLS rules. This may enable Vector to select feeders normally reserved for AUFLS to be used in rolling outages. However if network conditions change, the System Operator may revoke the modification at any time. Due to the commitment to customer notification prior to rolling outages, any modified AUFLS groups are unlikely to be included in planned outages because of the uncertainty of their availability. While this plan assumes that no AUFLS modification

exists, some AUFLS feeders may be included as indicated in section 4.5. The POP will be adjusted as and when required to accommodate any future changes to AUFLS block allocations.

4.7 Savings Calculations

Savings calculations have been based on the daily average energy consumption at the time rolling outages would take place (08:00 to 18:00).

The shutdown duration and the number of feeders selected for rolling outages will depend upon the savings required.

Savings calculations have been based upon the 2009 recorded feeder loads. For simplicity average energy use has been used during the expected rolling outage period.

4.7.1 Feeder Selection

Feeders to be disconnected are set out in the schedule of feeders for rolling outages. Because of AUFLS obligations and changes in network configuration, this schedule will change from time to time. The number of feeders chosen for any one day and week, will depend upon the savings required to meet target. Given that the actual selection of feeders during any outage will most likely diverge from this plan due to operational considerations the schedule of feeders is not made publicly available in order to avoid any confusion regarding which feeders are to be disconnected. In the event of pending rolling outages Vector will advise customers at the time – see Section 8

4.7.2 Auckland Region Feeders

The number of AUFLS feeders is 222 with 322 feeders remaining available for rolling outages. Sixteen feeders supplying essential services will not be included, leaving 306 feeders available for rolling outages.

4.7.2.1 Auckland Region Energy Consumption (average)

Average daily energy consumption	16769.8MWh
Average energy consumption per hour	698.7MWh
AUFLS Block 1 substations daily energy consumption	3388.2MWh
AUFLS Block 1 substations energy consumption per hour	141.2MWh
AUFLS Block 2 substations daily energy consumption	3552.8MWh
AUFLS Block 2 substations energy consumption per hour	148.0MWh
AUFLS Block 1 total average consumption	20.2%
AUFLS Block 2 total average consumption	21.2%
Remaining average consumption (available for rolling outages)	58.6%

4.7.3 Northern Region Feeders

The number of AUFLS feeders is 146, with 124 feeders remaining available for rolling outages. Two feeders supplying essential services will not be included, leaving 122 feeders available for rolling outages.

4.7.3.1 Northern Region Energy Consumption (average)

Average daily energy consumption	7415.7MWh
Average energy consumption per hour	309.0MWh
AUFLS Block 1 substations daily energy	1799.9MWh

consumption	
AUFLS Block 1 substations energy consumption per hour	75.0MWh
AUFLS Block 2 substations daily energy consumption	1821.0MWh
AUFLS Block 2 substations energy consumption per hour	75.9MWh
AUFLS Block 1 total average consumption	24.3%
AUFLS Block 2 total average consumption	24.6%
Remaining average consumption (available for rolling outages)	51.1%

4.7.4 Number of Feeders Included

Generally feeders will be selected from the schedule of feeders for rolling outages. The number of feeders selected will depend upon savings required. Table 2 shows the duration of outages for the percentage savings required.

4.8 Table 2 – Shed Times required to Meet Savings Targets

Savings Required	No of Days per Week	Average Time Off per Feeder each day (Auckland Region)	Total Number of Customers Affected (Auckland)	Average Time Off per Feeder each day (Northern Region)	Total Number of Customers Affected (Northern)
5%	5	4hrs	88784	4hrs	59307
10%	6	6hrs	91678	6hrs	65693
15%	7	6hrs	107971	6hrs	77008
20%	7	8hrs	107971	8hrs	77008
25%	7	10hrs	107971	10hrs	77008

The detailed list of feeders associated with percentage savings required are listed in schedule of feeders.

4.9 Medically Dependant Customers and Priority Sites

Vector will endeavor to give retailers as much advance notice as possible of pending rolling outages to enable them to notify medically dependant customers.

Priority sites listed in Auckland Engineering Lifelines Technical Publication No. 214 will be taken into consideration when scheduling rolling outages.

4.10 Load Variation

To ensure the national transmission network remains stable during rolling outages, the System Operator has requested that Vector's system load should not vary by more than 25MW during any 5 minute period. This applies both when shedding and restoring load.

4.11 Grid Emergency during Developing Event

If the System Operator declares a grid emergency during a **Developing Event** the grid emergency will take priority. As water heating load generally would not be used to reduce load in a developing event, Vector would have the water heating load available to respond to the grid emergency. If water heating load is insufficient, the rolling outage feeders may have to be rearranged to comply with the grid emergency. After the grid emergency is over, the programmed rolling outages pattern would continue.

5. Roles and Responsibilities

5.1 Vector Staff Responsibilities

ROLE	VECTOR PERSON RESPONSIBLE
Receive communication from Commission and System Operator	Vector Electricity Operations Centre
Implement this plan	Electricity Operations Manager
Weekly savings reporting	Network Performance Specialist
Customer notification	Customer Services Manager
Revoking rolling outages	Electricity Operations Manager
Reporting to Electricity Commission	Network Performance Specialist
Reporting to media	External Communications Manager
Reporting to public agencies	Customer Services Manager
Reporting to civil defence and Lifelines	Customer Services Manager

If listed Vector staff member is unavailable, the staff member must appoint an appropriate replacement.

5.2 Authority to Commence Rolling Outages

5.2.1 Developing Events

Upon receipt of direction from System Operator to prepare for rolling outages, Vector's Electricity Operations Manager will inform Vector's management and commence specific rolling outage plan preparations to meet the requirements of the instructions issued by the SO. Final authorisation to commence a programme of rolling outages will be made by Vector's Group Chief Executive Officer.

5.2.2 Immediate Events

On receipt of a **GEN** from the System Operator, Vector's Electricity Operations Controllers are authorised to take all necessary operational steps including the shedding of high voltage feeders where necessary to comply with the requirements of the **GEN**. The duty Electricity Operations Controller will initiate a priority notification.

5.2.3 Operations Planners

The Operations Planners will notify retailers of the extent of outages and where possible ICP numbers of customers affected.

6. Implementation and Management of Rolling Outages

6.1 Developing Events


Rolling outages will be the key mechanism for managing Developing Events. If the Commission uses its authority under the regulations to require, through the System Operator, a load reduction for a planned event, Vector must reduce demand to meet the Commission's targets. The targets may be a weekly energy savings target that is reviewed each week. To reduce energy usage, Vector would disconnect feeders (rolling outages) in a controlled manner to enable targets to be reached. There are financial penalties on distributors for not meeting targets set by the Commission. Water heating load shedding is generally not considered to be an effective option for energy savings because it does not result in a significant reduction in overall energy usage – it simply shifts the usage to a different time.

6.2 Rolling Outages

When instructed by the System Operator or the Commission to reduce demand, rolling outages will be instigated by Vector's Electricity Operations Manager following authorisation from Vector's Group Chief Executive Officer, as per this plan and outage strategy. The Electricity Operations Manager will ensure advance load shedding schedule is prepared and load is controlled and monitored to meet desired targets. Where possible Vector will endeavour to comply with priorities in Table 1 to select feeders for rolling outages. Vector will endeavour to keep rolling outages to any customer no longer than 4 hours in one day. For savings targets greater than 5%, longer and more frequent outages will be necessary as shown in 4.8 (Table 2).

Outages would be scheduled between 0800 and 1800 Monday to Friday and on Saturday and Sunday for larger savings targets.

6.3 Rolling Outages Timeline

WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6
Savings target received		Rolling outages commence 			
Feeders selected for rolling outages	Stakeholders notified of pending outages for following week	Stakeholders notified of pending outages for following week	Stakeholders notified of pending outages for following week	Stakeholders notified of pending outages for following week	Stakeholders notified of pending outages for following week
			Savings calculated. Adjustments made to schedule if required for week 6	Savings calculated. Adjustments made to schedule if required for week 7	Savings calculated. Adjustments made to schedule if required for week 8

6.4 Shutdown Notification

When requested to reduce demand with rolling outages, Vector will endeavour to advise customers in advance through media channels, of pending outages. Because demand varies from day to day the time and extent of advertised outages will be approximate.

6.5 Rolling Outages Actions

On receipt of the target savings required, the **Electricity Operations Manager** will:

- Review savings target received from the System Operator and decide whether rolling outages are required to meet the target and the extent of the outages required.
- Determine the number of feeders to be included in rolling outages from feeder list.
- Prepare rolling outages log sheets to list selected feeders and proposed shed times.
- Notify feeder shutdowns and times to:
 - Operations Planners;
 - Customer Service Manager and;
 - External Communications Manager.
- Provide the System Operator with a daily week-ahead forecast of half-hourly system load at each GXP during any period in which rolling outages are scheduled.
- Consult with the System Operator prior to implementing rolling outages to establish a process for shedding and restoration.
- Appoint dedicated Electricity Operations Controllers to control tripping and restoration of feeders via SCADA. Depending upon level of savings required, more than one controller may be required.

6.6 Other Planned Outages

Unless urgent, all Vector planned outages for maintenance will be cancelled during the period of rolling outages.

6.7 Supply Restoration

Load disconnected during rolling outages must be restored in conjunction with the System Operator. This is to prevent overloading the transmission network and creating further instability. Vector will ensure that all feeders are returned to service in a controlled manner to maintain system stability.

6.8 Contingent Events

If an unplanned event occurs that can alter the planned rolling outages, Vector's Major Incident Team will be responsible for all decisions and communication with stakeholders of any changes to advertised program. Where possible any changes to planned timetable will be published on Vector's Website.

7. Immediate Events

7.1 System Stability

Transpower, as the system Operator, is required to procure enough reserve generation to cover the risk of the largest connected generator tripping. They are also required to keep the system frequency at 50Hz. If a large generator trips, it may cause a reduction in frequency which if not rectified can result in other generators tripping which could lead to complete failure of the electricity network.

As reserve generation cannot immediately pick up the load of a disconnected generator, an immediate load reduction is required until additional generation can be brought on line. Automatic load shedding groups reduce load in stages until the frequency stabilises.

7.2 Transmission Grid Emergency

The System Operator may request Vector to reduce load under a **Grid Emergency Notice (GEN)**. Vector will commence with shedding water heating load and then if necessary shed feeders as per the priority list shown in schedule of feeders. If a **Developing Event** is in place, the grid emergency will take precedence.

7.3 Supply Restoration

Load disconnected during a grid emergency must be restored in conjunction with the System Operator. This is to prevent overloading transmission network and creating further instability. Vector will ensure that all feeders are returned to service in a controlled manner to maintain system stability.

8. Communications

8.1 Stakeholder Communications

8.1.1 Background

In a security of supply situation Vector will work with the Electricity Commission and the wider electricity industry in communicating the objectives and targets of a voluntary savings campaign to help ensure customers are as well informed as possible regarding events and plans for any outages.

Generally, security of supply issues arise from generation/transmission constraints, rather than distribution problems. Vector as a network distribution company will therefore follow the lead of the Electricity Commission and/or Transpower in implementing measures to restore the integrity of the electricity supply chain.

Depending on the circumstances – whether there is advanced notice of a security supply situation, or an immediate event triggering a grid emergency – Vector may also instigate its crisis management process.

8.1.2 Communication objectives and strategy

Communication objectives will take account of two security of supply situations:

- **Developing event** – the Electricity Commission will provide up to 14 days notice of a security of supply situation, and up to 9 days notice of a savings target.
- **Immediate event** – little or no notice. Vector will act under the instruction of the System Operator in managing the situation

In both cases, through consistent industry messages and multiple mass communication channels, the objective is to ensure the public are informed of any security of supply issues, industry actions and responsibilities, energy savings measures consumers may need to take and the implications of failing to meet targets. As in existing communication materials Vector will continue to reiterate that it can never guarantee an uninterrupted supply and medically dependent and vulnerable customers do need to prepare contingency plans to be used in the event of an outage. Retailers will have the overall responsibility for communicating with medically dependent and vulnerable customers.

In order to guarantee consistency of messages and industry approach, Vector will look to the Electricity Commission to establish an industry group to manage coordination of the communications campaign. Vector will coordinate messages with this group and the Electricity Commission.

A component of communications in both situations will be to outline the rolling outage process and which customers will be affected first – with the priority to maintain essential services.

8.1.3 Stakeholders

Scenario	Stakeholders	Responsibility
Developing event – up to 14 days notice of security of supply situation with 9 days notice of savings targets	General public (including medically dependant customers) Central Government Local Government Vector executive and Board Electricity retailers and generators District health boards Consumer and industry lobby groups Media Business associations Customer services - Vector	Electricity Commission/Government lead With support from retailers, generators, and lines companies. Vector will advise on regional specifics
Grid emergency	Central Government Local Government Electricity retailers District health boards General public (including vulnerable customers) Consumer and industry lobby groups Business associations MPs Customer services - Vector	Transpower lead. Vector will advise on regional specifics

Vector will keep media and customers informed of planned interruptions to supply before and during the outages. Media will be informed in line with Vector's standard communications plan. The Customer Service Manager, together with the Operations Planning Manager will be responsible for customer notification.

Vector will notify all stakeholders when targets are received and rolling outages are imminent. It is expected that this notification should be at least a week in advance of any rolling outages for a **Developing Event**. Generally **Immediate Events** occur as a result of equipment breakdowns and leave little or no time for advance notification. However notification of the event would occur as the event proceeded.

8.2 Communication with System Operator

All communications with the System Operator will be between Vector's Electricity Operating Centre and Regional Operating Centre using Transpower's TSX telephone.

8.2.1 Coordinating with the System Operator

If Vector has to depart from forecast load profile during rolling outages, Vector will communicate direct with Security Coordinator at the System Operator rather than with Regional Operating Centre.

8.3 Communication with The Commission

8.3.1 Vector Contact

Manager of Network Operations
Vector Ltd
PH: 09 978 7788
FAX: 09 978 7799
101 Carlton Gore Road, Newmarket
PO Box 99882, Newmarket, Auckland

8.3.2 Electricity Commission

Electricity Commission
PH: 04 460 8860
FAX: 04 460 8879
Level 7, ASB Bank Building, 2 Hunter Street,
PO Box 10041, Wellington

9. Measuring and Reporting

9.1 Target Monitoring

Actual energy savings will be measured by plotting the normal network load graph during period of planned rolling outages and plotting a savings curve for the same period. This way energy savings can be calculated and monitored.

For load shedding to meet a weekly target, Vector's Network Performance Specialist, will monitor energy savings against target and together with Electricity Operations Manager, review future load shedding. They will adjust future feeder selection to compensate for any under or over achieving of targets. Vector's Network Performance Specialist will be responsible for daily and weekly reporting of consumption relative to target levels. During the period of rolling outages, the Network Performance Specialist will report weekly by email to the Commission the actual energy usage compared with the energy used in corresponding week of previous year. The Network Performance Specialist will report any under or over achieving of targets to the Electricity Operations Manager to enable adjustments to be made in the following week's feeder selection.

9.2 Log of Rolling Outages

Vector's Electricity Operating Centre will log times of disconnection and reconnection of all feeder interruptions. The Network Performance Specialist will calculate savings made and enter them into the log. The log sheet to be used by Electricity Operating Centre is shown in Table 4.
