Attachment 1

Priority Utility Sites Project Report

Wellington Lifelines Group

&

Wairarapa Engineering Lifelines Association

July 2008

WGN_DOCS#567522

Contents

Executive Summary

The Civil Defence Emergency Management (CDEM) Act 2002 highlights the expectation of lifeline utilities on their business continuity planning to ensure essential services are continued or restored to key facilities and customers on a priority basis.

During an emergency CDEM agencies expect to know what service restoration priorities will be given to critical facilities by utility providers, so that they are able to establish response and recovery efforts. Section 10.1 of the Guide to the National CDEM Plan contains general priorities for restoration of service.

The Wellington Lifelines Group and the Wairarapa Engineering Lifelines Association undertook the Priority Utility Site Response and Recovery project in 2007. The aim of the project was to identify key community facilities and utility sites that are essential to support the recovery of the community following a major emergency and to identify their service restoration requirements.

For this project, critical facilities were identified as those locations that provide services that the community needs to function effectively following a major emergency, and are not easily relocated or cannot operate efficiently at an alternate site.

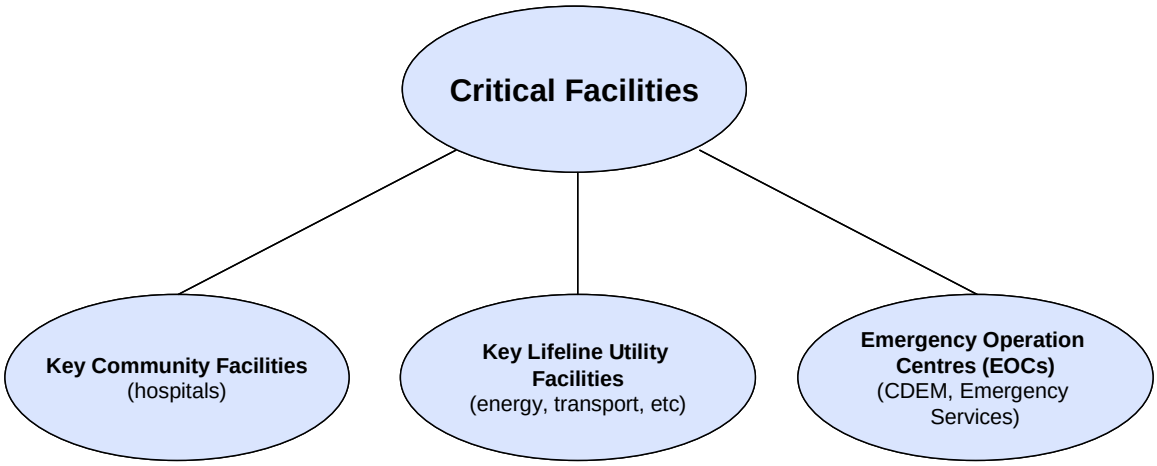

Diagram 1: Critical Facilities

Lifeline utilities are essential services that are required to support the community. These services include water; wastewater; power; gas; fuel; telecommunications and transportation. The Priority Utility Site project focuses on the physical locations of these critical facilities rather than links e.g. pipes.

A questionnaire was sent to lifeline utilities, hospitals, CDEM and emergency services to gain and collate information about their reliance on 'lifeline services' based on a Priority 1 to 3 ranking:

- Priority 1 – most important – cannot function without this service
- Priority 2 – can partially function without this service, or need this service to assist recovery
- Priority 3 – can fully function and recover without this service

An indication of the desired restoration time of each lifeline service was also requested in the questionnaire.

The questionnaire ranking was based on a 'ground zero' approach, which says that: *Given that all services/sites are down, which would be recovered first?* It was not based on a scenario approach looking at specific damage following a particular event e.g. major Wellington Fault earthquake.

The priority ranking and the desired restoration time highlighted the complexities of this project. For example, one critical facility rated electricity supply as a priority 1 with 10 days for service expectation, whereas other priority 1 ratings stated service expectation within hours. It is to be recognized that this is the ultimate period of time that this critical facility can operate to, and beyond this point they will be unable to operate efficiently, which may impact on other services and facilities.

The CDEM, Emergency Services and critical facilities sectors provided a 100% response rate to the questionnaire. At the time of finalising this report, 80% of lifeline utilities had provided responses. The level of information that was provided in the questionnaires ranged from extremely detailed that included maps and reference co-ordinates to minimal detail.

Further efforts are being made to obtain information from the lifeline utilities that did not provide responses. This will be incorporated in an updated version of this report and database.

In March 2008, a presentation to the lifeline sector groups using GIS maps and a master data sheet demonstrated how the information can be used in reduction and readiness as well as response and recovery.

A key project deliverable was the conversion of the information from the questionnaires into GIS layered maps reflecting critical facilities that were reliant on lifeline services. These were given to the lifeline utilities so they can assess the need of their service at those sites and incorporate this information into their existing systems.

Maintenance of the database and maps is proposed to be on an annual basis by Wellington Region CDEM Group, to ensure that the information is updated. A 5 year review of the project will be the responsibility of the Wellington Lifelines Group and Wairarapa Engineering Lifelines Association.

The broader question of how this information can be used by CDEM Emergency Operations Centres during an emergency is being explored further by the Greater Wellington Emergency Management office.

1. Introduction

1.1 Background

The Wellington Lifelines Group (WeLG) and the Wairarapa Engineering Lifelines Association (WELA) undertook the Priority Utility Site Response and Recovery Project in 2007/08. The project was based on the methodology developed by the Auckland Engineering Lifelines Group (AELG) in 2003, and subsequently adapted and applied by the Northland Lifelines Group. Other Lifeline Groups are currently undertaking Priority Sites Projects.

1.2 Objectives

The project objectives were to:

3. Identify key community facilities and utility sites that are essential to support the recovery of the community following a major emergency, and explore and document the utility restoration issues.

4. Identify and document the priority sites that each lifelines organisation should seek to restore their services to after an emergency taking into account Wellington CDEM Group priorities (e.g. the six critical needs) and interdependencies with other utilities.

The benefits of collating this information are to assist in a co-ordinated and largely pre-agreed response and recovery prioritisation, and to gain a common understanding of lifelines interdependencies around the Wellington region.

The collated information (project outputs) is intended to be of direct benefit to both CDEM agencies (e.g. to assist the CDEM Group Controller and Lifeline Co-ordinators) and lifeline utilities, who will be able to incorporate the relevant information into their response and recovery plans.

1.3 Key deliverables

The key deliverables of this project are:

- Each lifelines organisation:
  - has a list and map(s) of key community facilities, emergency operation centres and lifeline utility sites in the Wellington region that are reliant on their organisation
  - has an assessment of the need for their service at those critical sites
  - has an indication of the timescale for their service restoration at those critical sites
- There is a regional list of critical sites for response and recovery in the Wellington region for use in emergency management
- GIS based maps depicting critical facilities and key links for the CDEM Group

1.4 Utility Service Restoration Priorities

As defined in the Guide to the National Civil Defence Emergency Management Plan 2006 the priorities for utility/service restoration for all agencies to observe are:

1. Public health and safety (Hospitals, Ambulance)
2. Emergency Management (Police, Fire Service, Emergency Operations Centres)
3. Lifelines infrastructure (Energy, communications, water and transport)
4. Vulnerable sectors (immobile or vulnerable groups of people such as rest homes or prisons)
5. Isolated communities
6. Key areas (e.g. Central business districts)
7. Commercial producers
8. Residential zones

These CDEM priorities are intended to be flexible to reflect variables such as the hazard event, scale and impacts.

Critical facilities were defined as those locations that provide services that the community needs to function effectively following a major emergency, and are not easily relocated or cannot operate efficiently at an alternate site. The focus of this project was therefore on priorities 1-3 above.

CDEM and lifeline utilities also need to be mindful of the other priority categories for their planning.

2. Methodology

The following steps were taken to achieve the key deliverables:

Step 1: Establish project group

A representative was identified and appointed from the Wellington CDEM Group, key community facilities and the lifelines utility sector (one from Wellington/Kapiti and Wairarapa) to assist with overall project guidance including organisations to involve and consultation processes.

Step 2: Key Community Facilities

a) Overall community priorities were established

b) Specific community priority facilities for recovery (those sites that are considered necessary for community recovery following an emergency) were identified

c) The reliance on lifeline utilities for the above sites to function were established

Step 3: Key Lifelines Utility Sites

i. Each major utility confirmed their own key sites required for them to function

ii. The following considerations were taken into account:

- The network as it is today
- Whether the area of outage would be regionally significant if the site failed
- Whether there is sufficient redundancy that you would reasonably assume an alternative supply point will be operating (if there is, the site is not a priority)
- Critical facilities were defined as sites (physical locations) rather than links

iii. Each sector established their reliance on other lifeline utilities for them to function

Step 4: Interdependencies

a) Lifeline dependency information was collated

b) Each sector reviewed the order of their own critical sites based on the information provided

c) Overall regional priorities confirmed

Step 5: Mapping

a) Information was collated in to a GIS database

b) A format was established to map community, utility and EOCs relating to their interdependencies on a particular lifeline utility

3. Summary of Key Outcomes

The following summaries of key outcomes were provided in the returned questionnaires.

It is recognised that there are gaps within this project in the absence of the identification of some key lifeline utility critical sites. It is intended that the information gathered in this report is updated annually, at which time the additional information from outstanding questionnaires will be included.

3.1 Key Community Facilities

The four main regional hospitals (Wellington, Kenepuru, Hutt and Wairarapa) along with private hospitals, Wellington Free Ambulance and Wairarapa Ambulance were identified as important for managing public health and safety in an emergency in the Wellington region. Questionnaires were returned completed by all hospitals including private hospitals and Ambulance services.

Private hospitals were identified in the questionnaire as being an essential extension to service for regional hospitals during a major emergency. Wellington and Wairarapa Hospitals identified alternate sites that they had the ability to relocate to and provide part of their normal day to day functions. These were also considered as an essential facility in this project.

All four regional hospitals identified that the lack of access to the hospital sites will severely limit the delivery of health service. Hospital access has been identified by the CDEM Group as essential.

The restoration of the two bridges that straddle the Wairarapa Hospital campus would be a high priority in the Wairarapa. If these bridges were damaged, the hospital would be isolated from the majority of the community.

Telecommunication within and between the hospitals, as well as with DHBs in other regions is essential.

Wellington Hospital has its own Total Energy Centre that can provide more than 100% of the hospital needs. Planning should also consider ways in which this electricity could be used to power their alternate sites (Wellington College and Te Whaea Dance & Drama) or by other essential services if needed. They also have the capacity to be able to overstock with diesel if required.

The following are the key community facilities identified in this project:

Regional Hospitals	Wellington Hospital *Alternate sites: Wellington College and Te Whaea Dance & Drama Centre* Kenepuru Community Hospital Hutt Hospital Wairarapa Hospital *Alternate sites: Rathkeale College and St John HQ*
Private Hospitals	Wakefield Hospital Southern Cross Hospital Bowen Hospital
Other	Kapiti Health Centre Wellington Free Ambulance HQ

3.2 Emergency Operation Centres

The questionnaires from Emergency Services and CDEM were completed, and the following were identified as essential emergency management sites:

- Fire Stations (7)
- Police Stations (10)
- Local Authority EOCs and alternate EOCs (12)
- Key communication sites supporting emergency management (Mt Climie repeater site)

Most of the emergency services and Local Authority EOCs are able to readily relocate. Purpose-built EOCs have less dependency for service restoration than other EOCs e.g. with provision for bulk water and fuel supplies for emergency generators.

Telecommunications for all the emergency services is a priority, with limited back up services available.

3.3 Lifeline Utilities

Electricity

Transpower is the owner of New Zealand's high voltage transmission grid and the System Operator for the New Zealand electricity system.

The Wellington region is supplied with electricity from the National Grid via a number of transmission lines. The majority of the lines pass over hilly and sometimes rugged terrain. There is inherently some redundancy built into the network, should a line go out of service.

The National Co-ordination Centre (Transpower House, Wellington), the Regional Operating Centre (Haywards) and major substations have been identified in this project as Transpower key sites.

These facilities are all located close to the Wellington Fault.

The reliance of electricity suppliers Vector and Electra on bulk supply of electricity from Transpower is recognised, and both have redundancy built into their networks.

However, there would be less flexibility in terms of being able to shift the load from one substation to another when the load is at a peak or the network has been damaged due to a major event. Electra has a backup control centre in Levin and can also run the network remotely from a secure laptop.

There will be a heavy reliance on communications especially mobile phones for electricity suppliers and their contractors / service staff even with the availability of VHF radios.

Gas

Novagas are dependent on Vector Gas Transmission to be operational, with their critical site Tawa B Gas Gate located at the Tawa Interchange. Communication is highlighted as their critical priority during an emergency.

Powerco (Gas) operational planning and admin can be relocated to New Plymouth if both of their Wellington based sites are unavailable, provided there are means of communication to their Wellington region staff.

Road access and petrol/diesel will be required for service staff to repair/reinstate the network. It will be essential to co-ordinate with electricity restoration due to fire hazards. Should the gas network collapse i.e. lose all pressure and have air enter the mains, a full recommissioning of the network will be required. In this case the estimated time to restore full service is in the order of months.

Fuel

The Hutt City Oil Terminal (Port Road, Seaview), Mobil Seaview Terminal (Seaview Road) and Chevron Seaview Terminal (Seaview Road) provide the major bulk fuel supply for the fuel sector in the Wellington region.

The loss of power or closure of road access would severely affect these critical sites, and without water, the ability to extinguish fire would be compromised. Contingency plans are in place to supply other regions with fuel from alternate sites such as Napier and New Plymouth.

Major fuel stations have not been identified in this project. The CDEM sector however has been working together with organisations within the fuel sector to plan for major events affecting the supply of fuel to essential services.

It is understood that the Ministry of Civil Defence Emergency Management (MCDEM) are progressing a national fuel contingency plan.

Transport

The hazardscape of the Wellington region creates a unique situation for the region's transport links with the rest of New Zealand. Essentially, there are two main corridors traversing the north/south valleys culminating in the Wellington CBD that the main roading and rail utilise.

Transit has prioritised State Highways 1 and 2 as they provide land-links to outside the region. All Transit routes will be maintained by their contracted supplier and other suppliers can be called on as the need arises.

The National Train Control Centre situated at the Wellington Railway Station is considered a critical site. If essential services such as power and communication are

disrupted all trains nationally will stop. This includes Auckland Metro, which has only limited train control situated within the Britomart Control Centre.

Wellington International Airport Limited (WIAL) is a critical link for the Wellington region and during a major emergency would be seen as a logistical hub for regional or national resources. The essential priority utilities that WIAL have highlighted in this project are roading, telecommunications, power and water.

WIAL have agreements with contractors for runway/taxiway infrastructure services, however priority is required for movement/access of staff and plant to undertake assessments and repairs for the airport to operate even on a limited basis.

Two standby generators would provide 75% of services for 48 hours for WIAL, which could be extended by load shedding for only critical services.

CentrePort Ltd has the ability to shift operations around the port area. This is dependent on the event as a very large section of the port has high liquefaction possibility, and also the type of operations required. For example, oil and fuel deliveries are confined to specific locations (Seaview and Burnham wharves). Passenger movements could be accommodated on any wharf should the vessel be compatible with the conditions.

In the event of a major emergency, the port facilities would be utilised for the delivery of supplies and transportation of injured, if required. Electricity would however be essential for the operation of cranes as they do not work on generators, and mobile cranes have a limited application. Roading access to port facilities would be critical for CentrePort staff and emergency services in such an event.

Telecommunications

Telecommunication sites have been listed on the basis of their regional significance. Sites will need to rely heavily on battery and generator backup in the event of power failure, and would require fuel and roading access to ensure generator power is maintained.

Water Supply and Wastewater

Greater Wellington Water is the major supplier of bulk water for Hutt, Wellington City and Porirua through Te Marua, Wainuiomata and Waterloo. Kapiti Coast and the Wairarapa bulk water is supplied locally. Local network operators (local authorities or companies owned by local authorities e.g. Capacity who delivers water, stormwater and wastewater on behalf of Wellington and Hutt City Councils) receive their water through Greater Wellington Water.

Generators are available to run the plants in the event of power outages. However depending on the nature of the emergency, if road access and fuel supply are problematic, then at some stage both water supply and sewage disposal will be affected.

The major bulk water sites have been identified as well as water and wastewater sites. In the event of a major emergency, there would be widespread losses of service affecting the community, and there would be insufficient alternative arrangements available.

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4. Summary of Project Information

Information gathered by this project is available in the principal formats:

1. A master list of all critical facilities (key community and lifeline utility) in an Excel spreadsheet
2. GIS database and hard copy maps

The master spreadsheet summarises the questionnaire responses in terms of the dependence of each facility on the lifeline utilities that serve that facility. The physical addresses and GIS co-ordinates are also included separately in this master database.

The questionnaire responses include the priority restoration categories rated as:

- Priority 1 –most important – cannot function without this service
- Priority 2 – can partially function without this service, or need this service to assist recovery
- Priority 3 – can fully function and recover without this service

It is important to note that these ratings are self-assessments and are not intended to represent expectations on the utilities.

Some aspects of these self-assessed ratings are counter-intuitive at first glance. For example, Wellington Hospital in a Priority 3 category for power restoration. This simply reflects their high level of resilience due to their Total Energy Centre.

The maps can be plotted in various configurations, depending on the information sought. The standard representation is a plot of the critical sites by territorial authority district, and their dependency priority category.

5. Implementation

The following information will be issued to Wellington and Wairarapa lifeline utilities and the CDEM sector:

- A master list/database of all critical facilities (key community and lifeline utility facilities and EOCs) and the dependence on lifeline services to function at each site
- A list of physical addresses and GIS co-ordinates for each critical facility
- Maps (hard copy) for each utility sector highlighting the priority of their service for critical facilities

- Maps (hard copy) for CDEM sector highlighting all critical facilities
- A disc containing the GIS shape files, layers and databases developed by the Greater Wellington Emergency Management office.

It is intended that lifeline utilities use the provided project information to:

- Review their own critical site dependency on other utilities and in the development of contingency plans if these services fail;
- Look at longer term solutions of supply gaps e.g. transferring operations to lessen the demand and/or improving their emergency capacity

Lifeline utilities may also wish to use this information directly for response and recovery by either direct incorporation into existing datasets or by cross reference to printed maps.

For key community facilities, emergency services and emergency operating centres, the information and GIS layers should be incorporated into existing datasets or systems as another tool to aid decision making in response and recovery.

6. Maintenance

It is intended that the information obtained in this project be updated annually. The master list/database will be sent to all critical facilities to provide any amendments and changes. This role will be undertaken by the Greater Wellington Emergency Management office.

A five year review of the project is to be undertaken by WeLG and WELA.

7. Related Projects and Further Development

The information from this project will assist the forthcoming WeLG project to update the critical areas (or 'hot spots') of Wellington region. This information may be incorporated into this project and transferred on to GIS mapping.

GIS is a tool that can add value to readiness and response activities. The GIS layered maps provide a platform whereby a common understanding of the connections between lifeline utilities within the context of emergency management can be made.

However, the use of this tool in readiness and response requires further development in areas such as the information held on critical sites and the sharing of this information