



National Lifelines Forum

22 and 23 September, 2010

Kingsgate Hotel Portland, Wellington

Key Points Arising

Eighty-one registrations were accepted for the 2010 National Lifelines Forum, a further increase from last year.

The Forum took place soon after the Darfield earthquake (4 September).

A summary of the main points is in the following table. The second column lists ideas for Lifelines Groups and national utilities, and other relevant matters.

Item	Next Steps/ Suggested Lifelines Group and Lifeline Utility Actions
<p>Welcome and Opening</p> <p>John Hamilton, Director of Civil Defence Emergency Management, opened the Forum. Commenting on the response to the Darfield earthquake, John emphasised the importance of teamwork and planning and the value of a sound evidence base for decisions, within the context of resilience.</p>	<p>Presentations later in the Forum enabled an information exchange on Lifelines learnings from Darfield, and further opportunities are planned.</p>
<p>1. Lifeline Group Activities</p> <p>Northland: has completed Infrastructure Resilience and a power outage plans, and is now working on tsunami issues and regional petroleum planning</p> <p>Auckland: is continuing to update the major 1999 project on infrastructure and natural hazards. Much work is underway or has been completed on volcanic issues.</p>	<p>The Infrastructure Resilience Plan, in particular, is a good example of useful material prepared within limited resourcing, including good use of charts and diagrams, in ring binder format.</p> <p>The updated Auckland project (perhaps in a reduced form) could be followed by other Lifeline Groups in developing or updating similar projects. NELC are supporting and is involved in this project.</p>

Taranaki: Has had a worthwhile exchange with Transpower on electricity security (the reliability of gas supply to New Zealand is a particular issue)

Wellington: has commissioned the “BERL Report” on GDP impacts of infrastructure loss from major Wellington earthquake (cost estimated at \$3.1 billion). Is also revisiting critical areas listing and is undertaking pilot project on multi-agency response coordination in Thorndon.

West Coast: Has undertaken work on generator plug standards, and has sought / received advice from GNS Science re Alpine Fault avoidance zone.

Canterbury: Has been reorganised with a new Steering Committee. Has undertaken work on interdependencies. Work undertaken has been assembled in a Resources Folder.

Other groups have been developing projects on vulnerability including GIS mapping, interdependencies, earthquake and tsunami preparedness, critical sites / routes, generator availability and fuel availability. Arrangements with CDEM Groups are being strengthened in a number of areas, including appointments of Lifeline Utility Coordinators.

Engagement with Transpower, enabling increased understanding of electricity supply reliability, is welcomed.

Learnings from the pilot study may inform further work in Wellington and in other Group areas. Copies of the report are available from Dave Brunndon.

Generator plugs are a good example of practical contributions that Lifeline Groups can make. Engagement with GNS Science welcomed.

Good organisational examples (improved governance, resource access)

Good examples of work in these areas are available for other Groups to follow as they consider their work programmes. There are advantages in developing nationally consistent approaches in these areas.

2. National Lifeline Providers

National providers mentioned their work in

- mitigating earthquake risk and capturing learnings from Darfield
- learning from overseas emergencies
- improving business continuity planning
- improving dialogues with others in the supply chain
- adding generator and communications capacity

Points of interest include the value of

- seismic testing of sensitive components
- seismically restraining plant
- attention to emergency communications media
- careful consideration of hidden interdependencies (e.g. fuel supply to Christchurch was under threat following the earthquake due to difficulties in availability of water for fire fighting at tank farm).

In separate sessions

- Ian Burgwin described Transpower's work programme, which is to catch up on new investment deferred since the 1980s. The main areas of work are the North Island Grid Upgrade, expansion of the HVDC link, and the Northland and Auckland Upgrade
- Steve Ilkovics outlined the activities of the gas transmission Critical Contingency Operator in its first year

Increased electricity security and efficiency should result. A key learning is that deferred work can reliability problems and then to catch-ups that can be expensive and difficult to organise

A particular challenge arose in July when the Pohokura production station temporarily and unexpectedly ceased operations

3. Earthquake Matters

Chile, magnitude 8.8, 27 February 2010

John Hamilton and others reported on their visit to Chile following their recent earthquake and tsunami. Noteworthy points:

- Public awareness of earthquakes appears to be weak, but tsunami awareness good (personal resilience appears strongest in the less-wealthy areas)
- Extensive damage to utilities occurred (bridges, water, wastewater, electricity, gas). Many utilities responded well (e.g. use of repair crews from other locations). Telecommunications weaknesses impeded the response. Water unavailability led to civil unrest.
- Earthquake damage was severe but less than the visiting team expected. Tsunami damage was very substantial and surprisingly random
- Buildings survived quite well structurally other than where soil is soft. However much internal damage severely impeded resumed use of many buildings
- Recovery planning appeared to be more effective than response planning

Questions were raised re the extent of damage given that peak accelerations were less than the commonly-used 0.5 g design level

Darfield, magnitude 7.1, 4 September 2010

GNS Science reported on their immediate post-event liaison with CDEM, enhanced monitoring and initial understandings of the event characteristics including aftershocks. Peak ground accelerations ranged from 0.6 g at Darfield to 0.2 g in the CBD.

Lessons include the importance of

- quick action including use of temporary infrastructure fixes
- careful post-earthquake inspections – e.g. a cable dislodged by the earthquake but not noticed in post-earthquake inspections, fell onto adjacent cables causing a second electricity outage on 15 March (16 days later)
- careful pre-event consideration of communication media – e.g. many infrastructure providers, reliant on public telecommunications systems, experienced great difficulty when these failed
- confining steel reinforcing – lack of confinements was a common cause of building damage
- information sharing – a visit participant noted the seemingly excessive secrecy surrounding much information

The key messages for Lifeline utilities include

- the benefits of pre-event mitigation – Transpower's and Orion's work since the 1995 "Risks and Realities" report particularly noted

The duration was short and the length of the rupture also short (both compared to Chile)

Mark Gordon, Canterbury Lifeline Utility Coordinator, described infrastructure issues over the first few days. Sectors where issues arose included

- Electricity – transmission recovered after 3 ½ hours – distribution took just 2 days for 99 percent recovery
- Cell phones – generators and fuel required when batteries ran out following electricity outages
- Roads – a few closed but generally briefly for inspection (bridges, tunnel)
- Fuel – some queuing at service stations – supply route from Port compromised – advice sought from NCMC
- Port and Airport terminal – some damage but operations resumed quickly
- Water – considerable damage in areas of liquefaction. “Boil Water Notices” issued – fire risks arose
- Sewerage – much damage and few satisfactory quick fixes

- the importance of working together – e.g.
 - NZTA’s cooperation in temporary tunnel closures to allow fuel tankers to convey volatile fuels, given that normal road access was blocked
 - coordinating over electricity restoration to cell sites
- the importance of a good working relationship with CDEM – e.g. CDEM authorities enables access to key infrastructure sites in areas that had been cordoned off

Participation in Lifelines activities has been very helpful in advancing these matters.

Consideration is being given to ways to share the learnings with other Lifeline Groups.

4. National Projects

Natural Hazards Research Platform

Kelvin Berryman from GNS Science reported on the new “platform” for coordinating natural hazards research. Long term funding is to be available under “self-managing” arrangements led by GNS Science and NIWA. A governance structure has been set up, and research is being organised under five themes: Geological, Meteorological, Buildings and Infrastructure, Risk Evaluation and Societal.

Infrastructure Resilience and the National Infrastructure Plan

Kerry Hollingsworth from Treasury’s National Infrastructure Unit noted recent steps towards development of infrastructure planning at the national level. The next edition, scheduled for early 2011, will set out a 20 year view based on scenarios and cover a number of themes including infrastructure resilience

Research ideas suggested in breakout sessions focussed largely on practical matters relating to earthquakes, including mitigation of infrastructure risks in liquefaction zones and fault crossings, liquefaction mapping, seismic restraint and pallet racking issues. These and other research ideas raised are in Attachment 1.

Infrastructure companies (and others) will have two opportunities to comment on the 2011 version of the Plan, i.e.

- when a draft is issued, expected in December 2010
- on a “near final” version early in 2011

Tony Fenwick, working for the National Engineering Lifelines Committee, outlined the approach suggested in discussions with Treasury. The key points include that

- infrastructure providers can be expected to deliver resilience to a level that is less than optimal from a wider societal point of view, but that that level is in turn less than 100 percent security
- commercial / contractual arrangements are not likely to be sufficient to meet consumers' needs in many cases
- an infrastructure resilience programme should be built around three themes, robust assets (or sound alternative arrangements), coordination in preparedness and response, and promotion of realistic end-user expectations.
- further work will be needed to shape up the elements of a programme

NELC also welcomes ideas for inclusion in the Plan. Preferably these should align with one of the three suggested themes, robust assets, coordination in preparedness and response, and promoting realistic end-user expectations.

A key point in NELC's submissions has been that much can be done with very limited capital / operating public expenditure (most Lifeline activity falls into that category). Ideas consistent with this are more likely to find a place in a programme in the coming period.

5. **Ministry of Civil Defence & Emergency Management Activities**

David Coetzee and Mark Constable outlined MCDEM's new Emergency Management Information System

Jo Horrocks outlined MCDEM's work in monitoring the capability of CDEM Groups

Jo Guard outlined the plans for Exercise Tangaroa (tsunami preparedness)

The system should offer major improvements in emergency management. Infrastructure network information will need to be added for maximum usefulness. Infrastructure providers will be able to access EMIS (internet access and hardware are the only requirements).

MCDEM intends to extend the programme to cover the CDEM capability of lifelines and government departments - to commence in the second quarter of 2011. These results will contribute to the nationwide assessment of CDEM capability and capacity.

The exercise was held soon after the Forum (on 20 October 2010)

6. Other Points of Interest

Grant Dellow and Brad Scott provided an update on the GeoNet landslide and volcanic monitoring programmes

Barry Brailey outlined the work undertaken by the Centre for Critical Infrastructure Protection on cyber threats. A brief overview of an upcoming cyber security exercise was also presented and some developing cyber security initiatives were described.

Erica Seville reported on a recent paper raising the question whether Waste Management should be a lifeline

Tom Wilson gave an update on research on volcanic ash impacts on electricity transmission

Further information, including subscription information, is available at <http://www.geonet.org.nz/index.html>.

CCIP's system of Security Information Exchanges covers internet, telecommunications, control systems (SCADA), fraud and financial institutions. Consideration is being given to adding transport and other utilities.

The paper is available at <http://www.resorgs.org.nz/>.

Volcanic research lags earthquakes, and this work programme adds significantly to knowledge on the topic.

The VISG Annual Workshop is being held in New Plymouth on 28 October

The financial support of EQC for the National Lifelines Forum is gratefully acknowledged

Attachment

NATURAL HAZARDS RESEARCH PLATFORM: AREAS OF INFRASTRUCTURE RESEARCH NEEDS SUGGESTED AT THE 2010 NATIONAL LIFELINES FORUM

Geohazards and Infrastructure

- 1 Best-practice guidance for lifeline utility assets in areas of potential liquefaction, relating to
 - new asset design
 - mitigation of existing assets.

Review of available literature suggested as initial step (eg. American Lifelines Alliance material)

- 2 Best-practice detailing design for network elements near to or on fault lines.

Review of available literature suggested as initial step

- 3 Indication of the level of confidence in liquefaction hazard zoning [in other regions.]
- 4 Develop principles [and recommendations for] planning debris disposal by Lifeline utilities, e.g. describing sites suitable for clean and contaminated material. (Refer Charlotte Brown's research.)

Structures and Contents

- 5 Best-practice information / codes for design of seismic restraint of heavy equipment and stored material. (Refer NZS 4219 and note the current IPENZ Working Group.)
- 6 Best-practice information / codes for design of pallet racks for heavy storage. (Check the BRANZ /NZSEE /EQC guide.)

Management and Resilience

- 7 Document factors that contributed to resilience success in the Darfield earthquake.
- 8 Develop principles and recommendations to improve inventory management by Lifeline Utilities.
- 9 Develop principles and recommendations to enhance community understandings of Lifeline service reliability.

Volcanic Hazard

- 10 Develop recommendations relating to mitigation of ash effects for air conditioning at sensitive sites (e.g. data centres), covering
 - how to protect and clean large units
 - frequency of filter replacement

Note: This might be part of a broader study on tolerance of plant types to different ash composition and particle sizes.

These suggestions will be discussed with the Natural Hazards Research Platform research providers