



## NATIONAL LIFELINES FORUM 2012 – KEY POINTS

A most worthwhile variety of current infrastructure resilience topics was discussed at the 2012 Forum, held in New Plymouth on 7 and 8 November. Sixty-nine registrations were received. Participants heard worthwhile presentations, participated in many discussions, and returned home with many ideas to apply in their lifeline group and utility work programmes.

Thanks are due to the Earthquake Commission for financial support for the Forum. Thanks also to members of the Taranaki Lifeline Advisory Group, and in particular to John Sutton for assistance with Forum arrangements.

Main points are summarised below. The second column lists reflections for Lifelines Groups and national utilities, and other relevant matters.

A complete set of Forum presentations is available at

[http://www.civildefence.govt.nz/memwebsite.nsf/wpg\\_URL/For-the-CDEM-Sector-Lifeline-Utilities-National-Lifelines-Forum-2012?OpenDocument](http://www.civildefence.govt.nz/memwebsite.nsf/wpg_URL/For-the-CDEM-Sector-Lifeline-Utilities-National-Lifelines-Forum-2012?OpenDocument).

### DAY ONE, 7 NOVEMBER 2012

#### Welcome and Forum Opening

Dave Brunsdon, Chair of the New Zealand Lifelines Committee, welcomed participants.

#### Status Reports from Lifeline Groups and National Utilities

The following is a selection of the main points from Lifeline Groups<sup>1</sup>:

**Northland:** Workshop held on business continuity (based on Christchurch learnings). Main project, *Infrastructure Resilience in Northland*, is progressing segment by segment.

**Auckland:** Resilience forum addressed by senior-level infrastructure representatives, with favourable feedback. Main project, *AELP2*, is progressing.

**Gisborne:** Interest in insurance issues.

**Bay of Plenty:** Improvements to processes and documentation across a number of fronts. New coordinator appointed (Steve Campbell).

**Waikato:** New coordinator appointed (Irving Young).

**Taranaki:** New debris management plan and aerial reconnaissance plan noted.

**Hawke's Bay:** Activity stepping up again after period of abeyance.

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<sup>1</sup> Further information is in separate document, *List of Lifelines Group Projects and Activities (November 2012 Update)*.

**Manawatu-Whanganui:** Activity stepping up again. Foodstuffs included in Steering Group.

**Wairapa:** No projects pending review of local government in the lower North Island.

**Wellington:** Richard Mowll has replaced Dave Brunson as Project Manager. Report on post-earthquake restoration time estimates nearing finality.

**Marlborough:** Involved in readiness and response CDEM plans.

**Canterbury:** Several initiatives planned / underway despite earthquake pressures including emergency water issues, and Lessons Learnt project with CERA.

**West Coast:** Ongoing practical work and earthquake-related preparations.

**Otago:** At early stages of work programme (electricity focus to date).

**Southland:** Vulnerability study nearing completion.

National utilities noted:

**Vodafone:** Taking Christchurch lessons into network design and related improvements.

**Kordia:** Ongoing work on buildings / generators.

**TelstraClear:** Taking Christchurch learnings into improvements to diversity around New Zealand.

**Transpower:** Improvements to transmission security around Auckland and upper North Island.

**Meridian:** Focussing on improvements in Twizel.

**NZTA:** Internal work on business continuity. Board discussion on lifeline obligations scheduled soon.

**Auckland International Airport:** Two large business continuity exercises held and emergency plan reviewed.

**Watercare:** Capital works programme driven by risk reduction considerations.

**FX Networks:** Further investment in fibre, and working with Chorus in Gisborne.

Lifeline Group representatives noted a general significant increase in interest in Lifelines work by community leaders and utility board members since the Canterbury earthquakes.

PRESENTATION	COMMENT
<b>The National Infrastructure Plan and Resilience</b>	
<p>Richard Ward and Roger Fairclough from Treasury's National Infrastructure Unit commented on the Unit's role, which focuses on advice to Ministers and promoting coordination of the work plans of the relevant ministries. Documents titled <i>National Infrastructure Plan</i> were released in 2010 and 2011, and an update is scheduled for 2014.</p> <p>Attributes, developed to guide the resilience components of the Unit's work, include an emphasis on end-user engagement. Current work includes improving information on infrastructure issues (including metrics), required to build an evidence-base to focus work programmes. An improved understanding of interdependencies is also needed.</p>	<p>Recent documents developed by the Unit include <i>Infrastructure 2012</i>, a report on the state of national infrastructure, and <i>Building Infrastructure</i>, one of a series of progress reports forming part of the government's business growth agenda.</p> <p>Links to these, and other infrastructure resilience issues are on Treasury's website: <a href="http://www.infrastrucutre.govt.nz">www.infrastrucutre.govt.nz</a>.</p> <p>A series of Treasury-led regional workshops is planned to address indicator-related issues. See the website for attendance and other details).</p>

<b>Update from GeoNet and the Volcanic Impacts Study Group (VISG)</b>	
<p>Brad Scott from GNS provided an overview of pre-event monitoring and post-event analysis relating to the August Tongariro eruption.</p> <p>Brad also commented on VISG activities including the Group's focus on issues relating to volcanic ash, noting risks to water supply, transport and electricity generation and transmission.</p> <p>Ken Gledhill and Sara Page spoke of new GeoNet developments, the tsunami warning system, and the range of information sharing initiatives. Smart phone apps are available, a new GeoNet website has been developed and social media are now used.</p>	<p>Ongoing activity in the volcanic plateau and further north suggests that volcanic issues need to feature strongly in North Island Lifeline agendas.</p> <p>The huge increase in hits on GeoNet's website since the early 2000's was noted (now up to 16,000 requests per second immediately after earthquakes, for example).</p>
<b>Field Visits</b>	
<p>The Taranaki Lifeline Advisory Group arranged visits to</p> <ul style="list-style-type: none"> <li>• Port Taranaki, where port loading services for a range of petrochemicals is a feature</li> <li>• Shell Todd Oil Services (STOS), we visited the emergency centre and the control room relating to the offshore Pohokura Field.</li> <li>• Vector Gas Control Centre, where the Maui and Vector transmission pipes are monitored and managed.</li> </ul>	<p>Participants benefitted from an improved appreciation of issues relating to petroleum sector management in Taranaki.</p> <p>Some participants commented on an apparent small number of staff involved in monitoring and managing nationally important infrastructure.</p> <p>Thanks are due to the hosting organisations, each of which devoted considerable time to making the visits possible.</p>
<p>Maurice Gilmour of STOS advises that he is available to answer any further questions (<a href="mailto:Maurice.gilmour@stos.co.nz">Maurice.gilmour@stos.co.nz</a>).</p>	

<b>DAY TWO, 8 NOVEMBER 2012</b>	
<b>The Canterbury Earthquake Sequence</b>	
<p>Warren Ladbroke, CERA's Infrastructure Technical Manager, provided an overview of infrastructure restoration and reconstruction in Christchurch.</p> <p>Much is being done under conditions of imperfect knowledge, particularly relating to the performance of buried assets in liquefiable soils. Other challenges include integrating infrastructure work with the overall recovery programme featuring many stakeholders. The restoration cost for water and roading is estimated at over \$2 billion.</p> <p>In the same way that Christchurch benefitted from mitigation work arising from experience in the 1987 Edgecumbe earthquake and from Christchurch's mid-1990s <i>Risks and Realities</i> exercise, the many Canterbury learnings need to be consolidated for ongoing</p>	<p>CERA's summary of infrastructure lessons (a work in progress) focuses on five themes: decision-making, asset performance, organisational performance, outage consequences and regulatory environment.</p> <p>Discussion focussed on the difficulties of building business cases for mitigation expenditures (especially the more costly possibilities) to deal with "high-impact, low-probability" events. Orion's seismic strengthening programme was noted in this context – it was progressed systematically since 1996, cost \$6 million and is estimated to have saved \$60 to \$65 million in direct asset replacement costs and repairs.</p> <p>An improved understanding of outage consequences including cascading impacts arising from interdependencies, together with increased corporate</p>

application to Christchurch and elsewhere.

John Mackenzie noted Orion's good work before and after the earthquakes on mitigating electricity supply risk and ensuring speedy restoration.

Erica Seville noted recent work of the Resilient Organisations Research Programme (ResOrgs), including development of an organisational resilience rating tool and resilience guidance for small businesses (see <http://www.resorgs.org.nz/>).

attention to resilience strategies (e.g. taking into account research and tools from ResOrgs), may offer answers.

The work of the Technical Council on Lifeline Earthquake Engineering (TCLEE) was noted (the draft report is available on <http://www.geengineeringsystems.com/>). A New Zealand Lifelines Committee report on the value of seismic mitigation in Christchurch, also noted at the Forum, is available at [http://www.civildefence.govt.nz/memwebsite.nsf/wpg\\_URL/For-the-CDEM-Sector-Lifeline-Utilities-Resources?OpenDocument](http://www.civildefence.govt.nz/memwebsite.nsf/wpg_URL/For-the-CDEM-Sector-Lifeline-Utilities-Resources?OpenDocument).

### Lifeline Group Methodologies and Forms of Output

Tony Fenwick, Principal Adviser, New Zealand Lifelines Committee, summarised past Lifeline Group projects and noted features that should be included in any future project work – the features include taking account of the way infrastructure is configured (links, nodes, points of co-location etc), understanding hazards, undertaking risk analysis and recommending mitigation.

Mark Constable noted that Lifeline Group projects can contribute to CDEM planning by adopting compatible approaches as suggested in documentation by the Ministry of Civil Defence & Emergency Management (CDEM Groups are now completing their second round of plans).

The projects can also inform Treasury's work on identification of hotspots and pinchpoints. Roger Fairclough noted that ongoing improvements in projects are valued, and that work needs to be done to identify issues at the national level.

Current issues include keeping project resourcing within reasonable bounds, and balancing projects against other ways to progress resilience such as learning from experience in other centres. Where projects are undertaken, the full checklist of desirable features contained in the presentation may be a useful resource for ongoing reference.

New modelling work aimed to quantify infrastructure outage losses and the benefits of mitigation has been funded by the Ministry of Business, Innovation and Employment. Utilities may be asked to assist with data.

### Building Issues for Lifeline Utilities Following Major Earthquakes

Dave Brunson highlighted key building performance issues relating to utilities including pre-earthquake preparatory measures.

Utilities with buildings important for post-earthquake performance need to take special steps to ensure that structures and components meet required standards.

The applicability of recent adjustments to legal descriptions of importance levels needs clarification (the adjustments appear to relate to fire only). Clarification of the relationship between these Building Act requirements and the Civil Defence Emergency Management Act remains an unmet need.

Pre and post-earthquake reviews by qualified engineers and geotechnical experts are needed. Issues to watch include risks arising from possible collapse of neighbouring buildings, imposition of access restrictions.

In summary, utilities need a clear view of the required post-disaster functionality of specific buildings and facilities. This would come from a strategic response plan (overview level), identifying the critical buildings or facilities and taking into account CDEM-critical activities.

<b>New Zealand Shakeout and the National Exercise Programme</b>	
<p>Jo Guard from the Ministry of Civil Defence &amp; Emergency Management drew attention to the main administrative and governance features of the National Exercise Programme.</p> <p>Jo also commented on the extensive pre-event Exercise ShakeOut publicity and the variety of forms of community participation. She added that many injuries occur after the shaking has stopped and that advice on “what to do next” is a logical next step.</p>	<p>A tier 3 exercise relating to an Alpine Fault earthquake is planned for 29 May 2013. All South Island CDEM Groups will be involved. The exercise will be led by the Canterbury Civil Defence Group.</p> <p>Around 1.3 million New Zealanders dropped, covered and held on 26 September 2012 – the number exceeded expectations and targets. A post-exercise evaluation is underway.</p>
<b>Other Agency Updates</b>	
<p><b>Ministry of Civil Defence &amp; Emergency Management</b></p> <p>Mark Constable drew attention to the findings of the recent review of the Christchurch civil defence earthquake response. The many recommendations included 22 relating to lifelines (examples are coordination between electricity and telecommunications, fuel distribution and evaluations of utility resilience in the main centres).</p> <p>Work on Lifeline Utility Coordination is being taken forward through forthcoming reviews of the National CDEM Plan / Guide, Director’s Guidelines and best practice guidance issued by the Ministry. A training package is also under development.</p> <p>The new Emergency Management Information System (EMIS) is being rolled out progressively with many steps now complete.</p> <p>The recently released <i>National CDEM Fuel Plan</i> provides a structure for planning at the regional level.</p> <p><b>Ministry of Business, Innovation and Employment</b></p> <p>James Goodchild outlined issues relating to the recent review of the Maui pipeline outage, and the current oil security review.</p> <p><b>Natural Hazards Research Programme</b></p> <p>Roger Fairclough, who leads the programme’s infrastructure component, drew attention to the range of government-funded research programmes recently undertaken and currently underway.</p>	<p>MCDEM is leading development of an inter-agency Corrective Action Plan build around 10 themes including lifelines.</p> <p>Fifteen of 16 CDEM Groups have now commenced use of EMIS – it has been used in five small events to date.</p> <p>Lifeline Groups considering fuel planning should take the national plan into account.</p> <p>A current oil security discussion paper contains a wide range of proposals to mitigate risks arising from international and domestic supply disruptions.</p> <p>Roger also mentioned most recently funded research under the Ministry of Business, Innovation and Employment’s Hazards and Infrastructure round. See the final page of this document for details.</p>

### Forum Closure

Dave Brunson noted the range of forms of output and outreach adopted by the various Lifeline Groups, and that a greater sense of “groundedness” appears to have arisen following the recent earthquakes. Awareness of the full consequences of infrastructure failure is a key to understanding the societal risks faced and thereby sharpening consideration of mitigation and preparedness. The National Lifeline Forum continues to provide a platform at which these issues are discussed with a view to shaping work programmes.

Dave concluded that The New Zealand Lifelines Committee will continue to support the regional groups, including looking to link work programmes effectively. The Committee’s areas of activity in the coming period will include

- Consolidating best practice lifeline learnings from Canterbury earthquakes
- Supporting the National Infrastructure Unit in relation to infrastructure resilience
- Supporting MCDEM in relation to development of the Lifeline Utility Co-ordination role.

### Volcanic Impacts Study Group (VISG)

The Forum was preceded by a well-attended evening session of the Volcanic Impacts Study Group (VISG). Brad Scott (GNS Science) updated participants on Tongariro activity, Johnny Wardman spoke about ash impacts on high voltage lines and Marlene Villemure drew lessons on volcanic ash management based on Christchurch liquefaction ejecta clean-up.

The VISG presentations are at <http://www.aelg.org.nz/volcanic-impacts/visg-seminar.cfm>.

### Recently Funded Infrastructure Research

The Ministry of Business, Innovation and Employment has recently funded a range of infrastructure-related research under its Hazards and Infrastructure programme. Selected items are listed below (see <http://www.msi.govt.nz/update-me/archive/msi-archive/2012-science-investment-round-results-archived/hazards-and-infrastructure-research-fund-recipients/> for details):

<b><i>Seismic Response of Underground Services</i></b>	Improved understanding of the performance and resilience of underground utilities under seismic loading within Christchurch. Recommendations and guidelines will be developed applicable to New Zealand as a whole.	Opus
<b><i>Resilient infrastructure through Effective Organisations</i></b>	Building resilient infrastructure through effective leadership and management of infrastructure organizations.	UoC
<b><i>Economics of Resilient Infrastructure</i></b>	Development of a Spatially Explicit Dynamic Economic Model (SEDEM) to simulate the economic consequences of infrastructure failures, initially in Christchurch and Auckland.	GNS
<b><i>New Zealand Climate Change, Impacts and Implications</i></b>	Climatic conditions to 2100 and assessed Impacts and Implications for the environment, economy and society.	NIWA
<b><i>Resilient Urban Futures</i></b>	Exploration of possible urban futures in the new green economy with resilience, liveability and competitiveness in mind.	UoO

New Zealand Lifelines Committee

**WELLINGTON**

November 2012