

NOTES FROM
INFRASTRUCTURE RESILIENCE WORKSHOP
TE PAPA, WELLINGTON, 11 APRIL 2007

A Workshop was held at Te Papa in the afternoon of 11 April 2007 to explore possibilities for improved arrangements to reduce the incidence of infrastructure failures and to promote rapid restoration of services in New Zealand.¹

The Workshop was attended by 20 invited representatives from infrastructure providers, together with representatives from sector associations, other stakeholders and officials (the total number of participants was 38). Peter Neilson (Chief Executive, Business Council for Sustainable Development) facilitated the Workshop. Professor Tom O'Rourke (Cornell University) addressed the Workshop and contributed to discussions.

Participants were grouped into six tables, bringing together those from

- Electricity generation / retailing
- Electricity lines (including transmission)
- Gas, petroleum and coal
- Information and communication technology (ICT)
- Transport
- Water and waste

The Workshop was structured around two main subjects

- Defining the Problem
- Possible Ways Forward

Copies of the task descriptions to guide discussion at the six tables are attached.

This note records main points developed at the tables and raised in plenary sessions.

Defining the Problem

Discussion focussed initially on risks arising from a wide range of potential failures.

Participants noted a range of problem dimensions

- managing failure risk at the *corporate level* (including ensuring short term cash flows and building longer term corporate reputation)
- managing risks at the *national level* (i.e. promoting both continuity of supply to consumers and building industry reputation).

¹ Thanks to EQC for facilitating access to Te Papa.

The issues can also be addressed from pre-event and post-event perspectives

- avoiding failures
- quick restoration when failures occur

Numerous hazards may impact

- natural hazards (e.g. earthquakes, floods)
- workforce vulnerabilities (e.g. pandemic)
- resource supply breakdown (the extent of reliance on “just-in-time” inventory management was noted)
- breakdown of internal procedures (e.g. installation design and maintenance)

Reliance by some infrastructure providers on a narrow range of sub-contractors was often mentioned at the Workshop as a point of vulnerability.

Timely restoration calls for prior attention to

- ways to obtain reliable information on the extent of the problem
- ability to quickly mobilise the required staff and other resources such as spare parts etc
- availability and location of records and control systems
- understanding of national emergency response objectives and restoration priorities
- clear roles and leadership, likely to be set out in plans, protocols etc

Participants also noted the tensions between

- commercial imperatives versus the public good (to what extent should commercial entities be expected to meet the costs of national risk reduction and readiness, recognising that costs are sometimes additional to corporate needs?)
- the requirements to deliver in line with private contracts versus national priorities (how might these be reconciled when supply shortfalls arise after a failure?)

The way these issues play out may differ from sector to sector, reflecting differing regulatory, contractual and technological circumstances. For example

- sudden national electricity outages are handled centrally in accordance with established rules aimed at re-balancing supply and demand (i.e. calling on additional generation and managing load reductions in pre-arranged increments)
- the manner in which national gas shortages are handled is set out in a protocol between the major gas market players (the protocol, which is

being reviewed, is currently non-binding and does not over-ride individual supply contracts)

- in telecommunications, the emphasis is on encouraging larger consumers to enter into contracts in which resilience needs are tailored case by case.

Participants at all tables noted the very extensive inter-dependencies that exist within infrastructure. For example, most infrastructure sectors need

- electricity, e.g. to maintain SCADA systems and to keep pumps and compressors running
- telecommunications, also needed for SCADA systems
- domestic and international transport, to move spare parts, bulky equipment, staff and contractors

The financial sector was identified as both critically important for commercial and societal continuity, and as heavily reliant on electricity and ICT.

The role of roads and rail (including bridges and tunnels) in providing corridors for the carriage of pipes and wires was noted, as were the issues that arise in accommodating requests for new installations, repairs and the like.

Participants identified gaps in present arrangements, including

- uncertainty about the appropriate balance between commercial imperatives and the public good, together with lack of clarity about who should meet financial costs arising from national resilience needs
- unclear response leadership roles of main players in some sectors (e.g. government agencies, regulatory bodies and infrastructure providers), together with unclear lines of communication
- lack of overall integrated infrastructure resilience planning and under-developed intra-industry resilience coordination (including mutual aid programmes)
- extensive reliance on contractors
- regulatory uncertainty in some areas, e.g. in relation to control under the Commerce Act
- uncertain priorities, both in relation to
 - infrastructure providers' expectations of priority access to needed inputs (including infrastructure inputs)
 - prioritising societal expectations for continuity and restoration (e.g. should hospitals be reconnected before schools)
- under-developed arrangements for structural assessments following earthquakes and similar events
- lack of an integrated GIS framework between infrastructure providers (an integrated framework might assist failure planning and response)
- shortcomings in community understanding and response to risk

Possible Ways Forward

Participants raised a number of ideas and avenues for consideration. These have been grouped below under the themes to which they relate.

Overall economic and regulatory context

The importance of an economic and regulatory environment that is conducive to investment, including clear investment signals, was noted. Several ongoing government work programmes are addressing some of these matters

- review of *Parts 4, 4A and 5 of the Commerce Act 1986* – the issue of ensuring adequate revenue for investment and innovation in electricity line and gas pipeline businesses (and other natural monopolies) is under consideration
- review of *institutional arrangements in electricity transmission regulation* – the jurisdictions of the Commerce Commission and the Electricity Commission are to be reconsidered with a view to promoting regulatory certainty
- development of a *National Policy Statement on Electricity Transmission* under the Resource Management Act 1991 – to help ensure that benefits of developing and operating transmission lines are recognised when decisions are taken on local effects
- review of policy on *infrastructure use of road reserve* – much work is being done including with local government (LGNZ) and the New Zealand Utility Advisory Group, and legislation is under preparation.

The possibility that insurance signals (e.g. premia targeted according to risk) might, over time, emerge as a strong driver for improved infrastructure management was mentioned.

Understanding the problem

Participants noted a need to better understand infrastructure inter-dependencies.

Work might also be done to improve understanding of specific locations where particular risks arise, e.g. due to co-location of infrastructure assets (bridges and the like) or where assets are located near known or emerging hazards.

Infrastructure or sector resilience audit(s) were suggested as a way to improve information leading to improved focus of resilience work.

Managing public expectations

Participants noted increasingly high community expectations that infrastructure services will be available reliably.

This expectation is reflected in sectoral government policy statements and the like. It is also reflected in section 60 of the Civil Defence Emergency Management Act 2002.² Participants noted that the section 60 obligation is not well defined and that work might be done to improve clarity in this area.

While recognising the leading role that infrastructure providers play in promoting reliability, participants also noted the importance of

- ensuring that industrial, commercial and household consumers are well informed about infrastructure supply risks
- developing ways that help these consumers to manage these risks, e.g. by
 - in the case of industrial and commercial consumers, diversifying reliance on single supply sources where this can be done cost-effectively
 - improving information on steps that can be taken at the household level
- promoting arrangements that enable consumers to select security levels that meet their needs, with pricing to match

The role of the media in promoting a sound community understanding of the issues was noted.

The potential role of corporate risk disclosure requirements (perhaps associated with stock exchange listings) was also noted.

Coordination

Several participants suggested steps to improve coordination across “The Four R’s” (risk Reduction, Readiness, Response and Recovery). Elements here might include

- improved role clarity, including clarity of the roles of government agencies
- steps to break down “silos” through improved cross-sector planning
- improved intra-industry arrangements, including (in Response phase)
 - improved coordination and communication including back-up arrangements
 - consideration of improved mutual aid (i.e. intra-industry assistance to meet service continuity and / or restoration needs following a failure)

² Section 60 includes the statement “Every lifeline utility must ensure that it is able to function to the fullest possible extent, even though this may be at a reduced level, during and after an emergency.” The term “lifeline utility” (which is defined in the Act) broadly coincides with the scope of infrastructure within the Infrastructure Resilience Project.

- consideration of ways to promote orderly access to resources in short supply, such as sub-contractors

Participants noted that Lifelines Engineering Groups are helpful in a number of these areas. More can be done here: the level of Lifeline activity is uneven across the regions and the National Committee could take a more systematic approach to resilience issues. The Transport Emergency Management Group also offers a sector-specific coordination model that might have applicability in other sectors.

The need to improve understandings around prioritisation of access to infrastructure services in short supply was also mentioned.

Some discussion took place on the appropriate agencies / fora to lead discussions. The CEO's Forum was mentioned as one possibly in electricity.

Part 2 of the Commerce Act was mentioned as possibly inhibiting cooperative intra-industry collaboration. Steps to reduce this (perceived or actual) risk might improve the climate for contingency planning in some sectors.

The question was also raised about the relative effort best put into Reduction and Readiness relative to Response.

Quick wins

The following specific ideas were raised. Some of these appear to be within relatively easy reach

- developing arrangements for structural assessments following earthquakes and similar events
- coordinated GIS implementation
- clarification of the nature and extent of the obligation on lifeline utilities to continue functioning during and after an emergency, including clarification of priority access to needed inputs and priorities for service restoration
- improving intra-sector coordination in emergency response
- ensuring that equipment is on hand to access harbour water for fire fighting

Conclusion

Participants noted that progress will *inter alia* require

- improved community understanding of the nature and extent of the problems
- improved dialogue with “New Zealand Inc” on the risks and the costs of alternative steps to reduce risks

- “what really matters?”, “what can we afford?”³
- coordination and collaboration between numerous parties, including government and infrastructure providers
- CEO-level ownership
- funding, including improved consensus on where financial costs should fall (infrastructure owners, taxpayers or consumers)

Participants noted that a government policy statement on infrastructure resilience may be helpful in promoting a cohesive approach.

Participants also noted that the issues are not unique to New Zealand. Learning from others’ experience might pay dividends.

DPMC
June 2007

³ An alternative way to approach this question is to ask “what (after a shock) would we have wished we had addressed?”

INFRASTRUCTURE RESILIENCE WORKSHOP - FIRST BREAKOUT

DEFINING THE PROBLEM

Duration: 40 minutes

Task:

- What does resilience mean in your sector?
- What infrastructure sectors does yours rely on, and what others rely on yours?
- What resilience gaps exist? (i.e. what's possible)

'Resilience' has the following dimensions

- Robustness
- Redundancy (i.e. surplus capacity)
- Resourcefulness
- Rapidity

'Gaps' refers to the difference between present condition and (some sense of an) optimal condition

Notes:

- Think broadly - we are looking for both government and corporate issues
- Second breakout session will bring the 'what's possible' question into sharper focus

The following schematic may assist

	Technical	Organisational	Social	Economic
Robustness				
Redundancy				
Resourcefulness				
Rapidity				

Task Description Break-out Session 2

INFRASTRUCTURE RESILIENCE WORKSHOP - SECOND BREAKOUT

POSSIBLE WAYS FORWARD

Duration: 40 minutes

Task:

- What really matters for improved resilience?
- What are the barriers to progressing these issues?
 - strategic
 - operational
 - other
- What improvements should be made? (i.e. what seems justifiable?)
- What 'quick wins' are possible, and how might we capitalise on them?

Note:

- Think broadly - we are looking for both government and corporate issues
- Possible discussion points might include
 - What are the drivers
 - Governance issues
 - Financial issues
 - Other policy issues
 - Implementation / practicalities