

9.0 RECOMMENDATIONS AND MONITORING

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Sections 9.1-9.5 provides a summary of all the suggested improvement actions identified by each sector during workshops held for AELP-2. It was originally compiled in early 2014.

Section 9.6 captures a number of recommendations arising from the Resilience Benchmarking Project undertaken by ALG in 2015.

It is intended that:

- Progress against these recommendations will be undertaken in the last meeting of each calendar year.
- Recommendations arising from new ALG projects be added in at the completion of each project.

9.1 General Recommendations

Opportunities to improve the management of all hazards in relation to lifeline utility operation include:

Recommendation	Status (Feb 2015)
1. Develop civil defence access arrangements to facilitate quick re-entry into cordoned off zones by network operators to isolate dangerous equipment, restore supplies, maintain service of critical facilities (eg: diesel for generators).	National protocols are in development. Auckland Council will develop operational plans in support of these as part of the 'Physical Evacuation Plan' in 2015. ALG providing input to that project.
2. Assess use of Riskscape tool for quantitative risk and impact assessments.	Auckland CDEM are leading this project and ALG will assist with coordinating lifelines input.
3. Consider accelerating existing plans for new investment in Auckland infrastructure.	This is up to each organisation to prioritise timing of resilience projects.
4. Develop policy relating to ensuring long term development plans support diversity (redundancy) in networks.	This is up to each organisation to consider the benefits and costs associated with providing diversity in networks. It is a key focus of major regional projects for most lifelines.
5. Review contingency plans (including contractors) to ensure processes in place for rapid assessments at key sites.	Lifeline utility role. Review progress at end year.
6. Carry out audits of contractor contingency plans.	Lifeline utility role. Review progress at end year.
7. Ensure contingency plans align with protocols for CDEM-lifelines engagement and participation in Sector Coordinating Entities.	Lifeline utility role. Review progress at end year.
8. Review processes for coordination of road and utilities in road response and restoration processes.	Confirm need for further work with transport sector.
9. Review spare equipment arrangements (location and availability).	Lifeline utility role. Review progress at end year.
10. Add hazard and infrastructure maps to Google Earth for accessibility and ease of use.	No progress.
11. Staff training in hazard impacts and response processes using learnings from AELP-2.	Lifeline utility role. Review progress at end year.

Volcanic Ash

Recommendation	Status Feb 2015
12. Review and update business continuity and emergency response arrangements to reflect updated volcanic ash advice (such as management of facilities and generators during an ash event) and ability to operate in a prolonged event.	Lifeline utility role. Review progress at end year.
13. Review contractors and suppliers arrangements for a volcanic event and ensure they have mitigation plans in place and the correct equipment and procedures for dealing with ash fall events.	Lifeline utility role. Review progress at end year.
14. Review standard building design allowances for ash fall scenarios.	Need to determine whose role this is.
15. Assess critical buildings in high risk ash fall areas.	Lifeline utility role. Review progress at end year.
16. Prepare leaflet for public with advice on hazards, ie, the need to prevent build-up of ash on roofs and any assistance available for this, what to do with ash removed from roofs and properties such as its correct placement on the berm (ie not in the kerbside stormwater channel or in stormwater catchpits, manholes or open drains), driving advice / protection of vehicles..	CDEM role. Review progress at end year.

Earthquake

Recommendation	Status Feb 2015
17. Undertake full seismic risk assessment of critical facilities.	Lifeline utility role. Review progress at end year.
18. Develop earthquake contingency plans/business continuity plans that include consideration of managing longer term after shocks.	Lifeline utility role. Review progress at end year.
19. Review the earthquake damage matrix developed for AELP which indicates significant levels of damage in liquefiable soils based on the earthquake scenario assessed, however given the relatively low earthquake risk, and the improved knowledge from the Canterbury earthquakes, this matrix needs to be reviewed).	Consider as future ALG project during next business plan.

Tsunami

Recommendation	Status Feb 2015
20. Review the likely impacts of tsunami on different assets types, incorporating learnings from past events (including risk associated with bridges, and utilities on bridges).	ALG/WeLG project current underway.
21. Build tsunami hazard risk assessment into future infrastructure design.	Lifelines to review once project above complete.
22. Develop tsunami contingency plans including consideration of ongoing effects of subsidence.	Lifelines to review once project above complete.

Severe Weather

Recommendation	Status Feb 2015
23. More detailed interdependency studies focusing on primary effects from the storm hazard and secondary effects due to loss of another lifeline.	Consider as future ALG project during next business plan.

9.2 Energy Sector

General

Recommendation	Status Feb 2015
1. Improve access by petroleum companies to generators and diesel to run generators in emergency conditions. This includes preparation of service stations so they are “generator capable”.	Fuel company role. Review status as part of fuel plan update later in 2015.
2. Review possibilities for dispensation from dangerous good licensing requirements to permit general freight trucks and their drivers to haul tank wagons in emergencies.	Need to determine whose role this is.
3. Consider possible access to diesel stock at Napier Port (19 million litres) held for use at Whirinaki Power Station when “normal” electricity supply arrangements are fully stretched.	Need to determine whose role this is.
4. Evaluate how Auckland’s (and surrounding regions) needs could be met in absence of a pipeline from the Marsden Point refinery, and/or Wiri terminal ¹ . This include considering possibilities for: <ul style="list-style-type: none"> a. facilities to offload petroleum products from ship tankers at an Auckland port (eg: purpose built manifold). b. barging of petroleum products from Marsden Point. c. increased road tanker loading capacity at Mt Maunganui and Marsden Point if refinery functioning. 	Need to determine whose role this is.
5. Explore issues relating to air emission consent at petrol refinery, specifically how breaches of the consent would be handled (fuel).	Refining NZ Role. Review progress at end year.
6. Investigate the possible adaptation of road tankers to pump direct to vehicle tanks (fuel).	Need to determine whose role this is.
7. Review contractor’s arrangements to ensure they have hazard-specific contingency plans that deal with hazard-specific issues (volcanic ash, liquefaction, heavy acceleration tripping, tsunami inundation, etc) including identification of required equipment and procedures.	Lifeline utility role. Review progress at end year.
8. Review spare equipment arrangements (location and availability) based on Canterbury/Edgecumbe findings, Exercise Ruaumoko, as well as other large scale natural hazards.	Lifeline utility role. Review progress at end year.

1. Evaluation of the use of rail for petroleum transport including a rail link to the Marsden Point refinery has been included in the Auckland Plan.

Volcano

Recommendation	Status Feb 2015
9. Review design codes of transformers for volcanic ash impacts (electricity companies).	Lifeline utility role. Review progress at end year.
10. Investigate method for clearing ash off floating roof tanks (Wiri Oil Terminal).	Lifeline utility role. Review progress at end year.
11. Review means of improved filtering of ash into motor with forced draft fan at Kumeu pump station.	Refining NZ role. Review progress at end year.

Earthquake

Recommendation	Status Feb 2015
24. Determine more defined timeframes for electricity restoration. Give direction to other lifelines as to expectations of times to restore.	Review as part of electricity contingency plan update 2015.
25. Carry out more detailed assessment of electricity sites where potential for damage may be underestimated.	Lifeline utility role. Review progress at end year.
26. Review cable installation specifications in light of Canterbury learnings.	Lifeline utility role. Review progress at end year.

Tsunami

Recommendation	Status Feb 2015
27. Install submersible fuses in new pits and pillars and submersible terminations on new switchgear within inundation area.	Ongoing practice.
28. Review whether it is good practice to shut down electricity substations in the predicted inundation areas.	Information may be provided through tsunami impacts project.

Severe Weather

Recommendation	Status Feb 2015
29. Wider use of water-proof service fuses in low lying areas and water-proof connections at substations.	Lifeline utility role. Review progress at end year.
30. Consider alternative access during flooding at Wellsford pump station.	Refining NZ role. Review progress at end year.

Technical Failure

Recommendation	Status Feb 2015
31. Consider n+1 scenario for increased risk in demand versus capacity to pumps at Marsden.	Refining NZ role. Review progress at end year.
32. Consider phasing of power or generation to maintain shipping and pipeline if 220kV outage affects Refinery.	Refining NZ role. Review progress at end year.

9.3 Telecommunications and Broadcasting Sector

General

Recommendation	Status Feb 2015
1. Improve understanding of consumers in the commercial sector on the vulnerability to phone systems and their management at times of stress.	Need to determine whose role this is.
2. Investigate the need for increased investment in batteries, generators and fuel to maintain electricity supply.	Lifeline utility role. Review progress at end year.
3. Review critical sites maps for completeness (eg: international cables).	Being done as part of hotspots project.
4. On-going program to replace aged battery backup in the network.	Ongoing

Volcanic Ash

Recommendation	Status Feb 2015
5. Guidance for volcanic ashfall preventative maintenance and clean up specific to telecommunication facilities.	Consider as ALG project in next business plan review.

Tsunami

Recommendation	Status Feb 2015
6. Investigate risk to fibre transmission at bridge crossings (tsunami/earthquake scenario).	Lifeline utility role following ALG/WeLG tsunami impacts project.

9.4 Transport Sector

General

Recommendation	Status Feb 2015
1. Review higher maintenance regime for ALG safe routes in their road network management contract.	Lifeline utility role. Review progress at end year.
2. Review the co-ordination of public transport needs for emergency response and evacuation including the arrangements for moving evacuees to staging posts, handling inter-modal evacuee transitions.	Will be done as part of Auckland Physical Evacuation Plan development in 2015.
3. Explore case for additional fuel at North Shore and Ardmore airfields.	Need to clarify whose role this is.
4. Investigate case for additional diesel-powered rail engines.	Review.
5. Develop integrated emergency detour / evacuation plans between AT and NZTA.	Part of Auckland Physical Evacuation Plan development.
6. Consider further use of advanced comms systems to give road contractors and utility operators more accurate and up to date information about actual and potential hazards to the road network.	ATOC role – review progress at end year.

Volcano

Recommendation	Status Feb 2015
7. Pre-identify potential tip sites for ash disposal.	Need to clarify whose role this is.
8. Improve the strategic location of ash-moving equipment and buses for evacuees during emergency events.	Need to clarify whose role this is.
9. Review alignment of scientific alert levels (especially levels 2 and 3) with CAA procedures.	Need to clarify whose role this is.
10. Develop process for cleaning Hangars.	Auckland Airport role.

Earthquake

Recommendation	Status Feb 2015
11. Review choice of materials when carrying out road works in liquefaction areas.	Lifeline utility role – review progress at end year.
12. Undertake recommendations from earthquake building risk review.	Auckland airport role.
13. Seek a technical report on the expected risk of liquefaction on Airport land - previously only one small area identified.	Auckland Airport role.
14. Review contingency plans to ensure they consider the effects of an earthquake on the utilities which supply the airport.	Auckland Airport role.

9.5 Waters and Waste Sector

General

Recommendation	Status Feb 2015
1. Develop transmission systems (water & wastewater) redundancy to extent possible.	Watercare role – ongoing.
2. Ongoing development and maintenance of overland flow paths to improve resilience of whole stormwater network (focus on pipes systems in larger catchments).	Council stormwater role – review progress at end year.
3. Critical asset model for stormwater to assess the network against other lifelines. To be used as a prioritisation tool for works/upgrades.	Council stormwater role – review progress at end year.

Volcano

Recommendation	Status Feb 2015
4. Covering and enclosing water and wastewater treatment infrastructure to prevent contamination.	Watercare role – review progress at end year.
5. Determine best methods and materials to keep ash out of catchpits.	Council stormwater role – review progress at end year.
6. Identify landfill sites for ash and debris disposal	Council solid waste role – review progress at end year.

Earthquake

Recommendation	Status Feb 2015
7. Develop and implement policy around seismic resilience of new and replacement infrastructure.	Lifeline utility role – review progress at end year.
8. Identify whether any stormwater dam structures which would threaten lives or seriously impact downstream development if failure occurred. Prepare strengthening plans and/or hazard mitigation plans as required.	Council stormwater role – review progress at end year.
9. Identify stormwater watercourses most at risk of blockage due to landslip and prioritise for inspection after earthquake event.	Council stormwater role – review progress at end year.

Tsunami

Recommendation	Status Feb 2015
10. Consider works to make the old and vulnerable pipes in the lower CBD and port area more resilient to EQ and tsunami.	Lifeline utility role – review progress at end year.

Severe Weather

Recommendation	Status Feb 2015
11. Ongoing dam safety management for onsite wastewater retention ponds, consider increased capacity.	Watercare role – review progress at end year.
12. Investigation/study into localised areas of significant depths of water.	Council stormwater role – review progress at end year.

9.6 Recommendations from Resilience Benchmarking

Recommendation	Status Feb 2015
1. Awareness raising at an executive level as to CDEM Act requirements, ALG activities and what the organisation is / should be doing in response to these requirements.	Lifeline utility role – review progress at end year.
2. Increased training of staff in relation to: <ul style="list-style-type: none"> a. their roles in emergency response and recovery situations b. the importance of personal and family preparedness for those people in key response roles c. wider awareness of lifeline utility – CDEM response and recovery protocols for those likely to be involved in response coordination. 	Lifeline utility role – review progress at end year.
3. The need to exercise lifelines-CDEM coordination processes more regularly.	Exercise scheduled May 2015.
4. Review of organisational emergency response plans to ensure they adequately meet requirements outlined in the Lifeline Utility-CDEM Coordination protocols.	Lifeline utility role – review progress at end year.
5. The need for a wider involvement and depth in capability to ensure the organisation can respond effectively if individuals are absent (it is common for many of the functions rely on one or two people).	Lifeline utility role – review progress at end year.
6. Review of processes for sharing of resources within sectors, including addressing technological and process compatibility to enable this to occur.	Lifeline utility role – review progress at end year.
7. Development of recovery strategies and plans.	Consider guidance as future ALG project.
8. Expansion of risk registers to include business / financial / reputational risks, not just physical asset risks.	Lifeline utility role – review progress at end year.
9. Review of priority supply and business continuity arrangements of key suppliers and contractors to ensure the entire supply chain is resilient.	Lifeline utility role – review progress at end year.
10. Alignment of emergency response definitions and escalation criteria across the lifelines and CDEM sector – development of a ‘common language’.	Consider guidance as future ALG project.