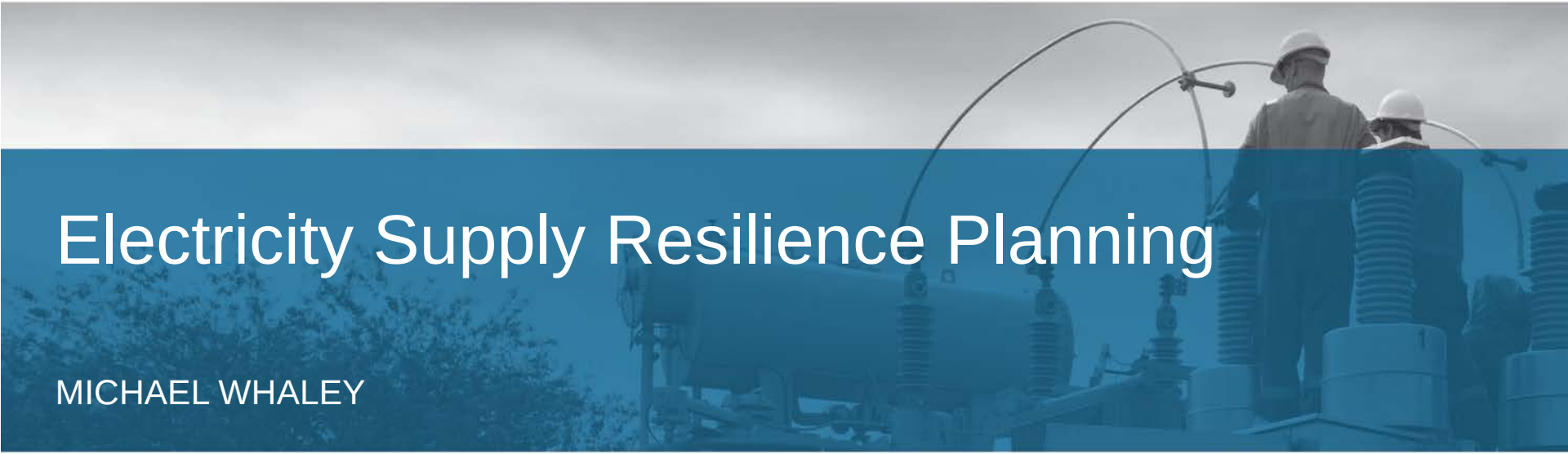
Electricity Engineers' Association

ASSET MANAGEMENT



Electricity Supply Resilience Planning

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EEA.CO.NZ

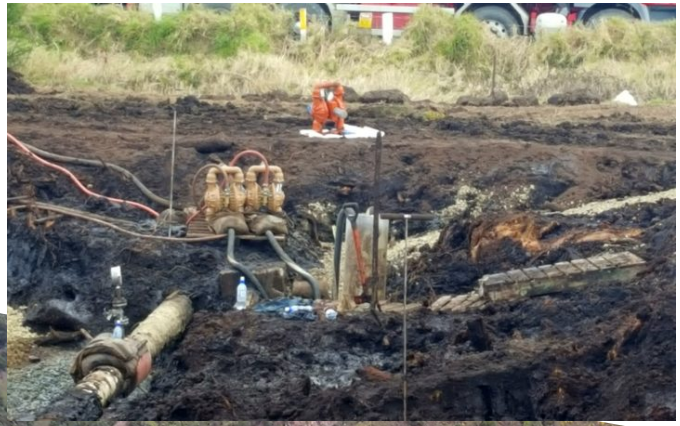
Reprint as at 1 June 2018

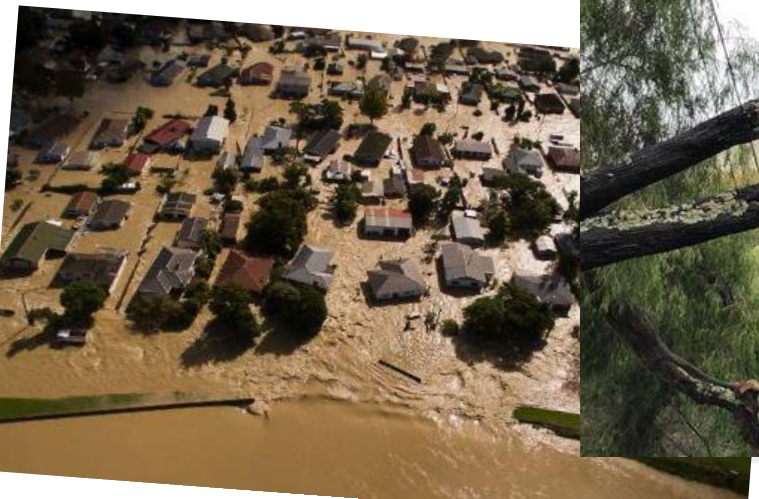
Civil Defence Emergency Management Act 2002

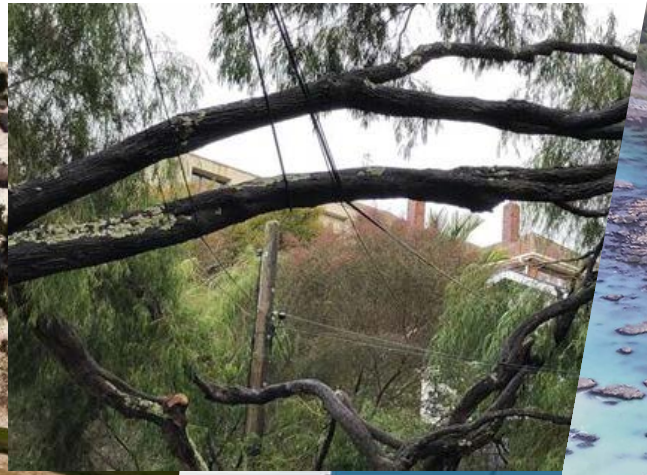
Public Act 2002 No 33
Date of assent 17 October 2002
Commencement see section 2

Recent events have heightened interest …

Auckland power outages in April 2018
New Plymouth water supply in February 2018
Fuel pipeline damaged in September 2017
Edgecumbe flood in April 2017
Kaikoura earthquake in November 2016
Havelock North water supply in August 2016







National CDEM Strategy Review …

NZ alignment with the UN Sendai Framework
Shifting focus from managing disasters to managing risk

- Understand disaster risk
- Strengthen disaster risk governance
- Invest in disaster risk reduction for resilience
- Enhance disaster preparedness for effective response

National CDEM Plan Order 2015 …

Describes different agency responsibilities with the 4Rs

- Reduction – take preventive steps to avoid or mitigate adverse consequences
- Readiness – plan, develop capability, exercise, test, monitor, evaluate, educate public, engage community
- Response – respond to emergency by coordinating with lead agency and activate own plans.
- Recovery – minimise consequence escalation, regenerate, enhance, adapt and reduce future exposures, resume functions

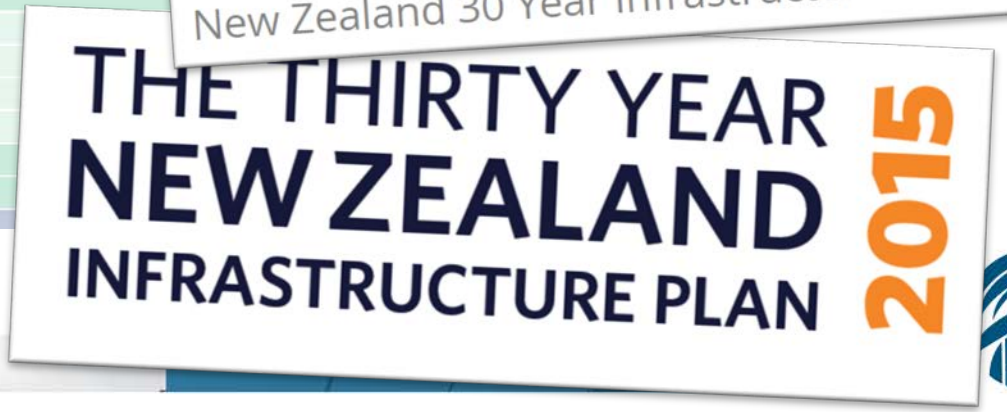
Treasury National Infrastructure Unit …

Example Only

Energy - Electricity

		Resilience Expectations	Assessed Resilience	Desired Movement	Indicator Sou Transport global : Transp Best Practice Asset Man Business Continuity Man Annual Financial Reports
Generation	Individual Generator <300MW			-	
	Individual Generator >300MW			-	
	River Chain >300MW			-	
Transmission	66kV			↑	
	110kV			↑	
	220kV & >			↑	
	HVDC			-	
Distribution	Embedded generation			-	
	Distribution <			-	
	Distribution 11kV			-	
	Distribution			-	
Retail	Retail functionality			-	
	Customer Interface			↑	

The government's vision is that, by 2045, New Zealand's infrastructure should be resilient and coordinated and contribute to growth and increased quality of life.This will be achieved through better use of existing assets and better allocation of new investment, as set out in the New Zealand 30 Year Infrastructure Plan 2015.



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Commerce Commission …

Open Letter 9 November 2017, Items 13, 14

- Increased focus on appropriate levels of resilience as Asset Management practices mature
- Engagement with customers over appropriate resilience levels
- Understand risks assets are exposed to, link between planned expenditures and resilience outcomes
- Plans for control, mitigation and reduction of event risks

Powerco CPP Determination Attachment L, Items 637, 638

- Maintenance of resilient networks is a key sector issue
- Effective asset managers focus on appropriate resilience levels

Resilience Definitions

"Resilience is the ability of assets, networks and systems to anticipate, absorb, adapt to and/ or rapidly recover from a disruptive event." UK Cabinet Office

"To prepare for and adapt to changing conditions and withstand and recover rapidly from disruptions… includes the ability to withstand and recover from deliberate attacks, accidents, or naturally occurring threats or incidents." White House Feb 12 2013

"To prepare and plan for, absorb, recover from, and more successfully adapt to adverse events." Committee on Increasing National Resilience to Hazards and Disasters

"The ability of a system to withstand a major disruption within acceptable degradation parameters and to recover within an acceptable time and composite costs and risks." Haimes, Y. Y. (2009)

Four aspects to Resilience

State of service provided by an infrastructure system in response to event disruption. How much has service been disrupted? How quickly can service be restored? How completely can service be restored?

State of system depends on how it was designed and operated. To what extent is service degraded following a disruption? How quickly can it recover? What level of service can it provide as it recovers? To what extent does system security or redundancy equate to resilience?

Different modes of response may lead to different resilience at different costs. What is the role of contingency planning, critical spares management, supply chain management?

Timescale dependence – to what extent should historical return periods be enhanced to cater for uncertainties? Is like for like replacement adequate?

Resilience Guide Proposal

Proposal to prepare a set of guidance notes that helps electricity supply industry to:

1. Measure its resilience effectiveness against each of the 4Rs; and

2. Undertake HILP event analysis as part of the Reduction phase and (to a lesser extent) the Readiness phase.

Questionnaire Exercise

Working as an individual, fill in and return the paper hand out questionnaire within the context of your own organisation.