Auckland Engineering Life Lines

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AUCKLAND REGION EMERGENCY MANAGEMENT GROUP

To: AELG and CEG

From: Lisa Roberts, on behalf of the project committee (Brian Park, Watercare; Robert Burley, Vector; Peter Halliwell, Air NZ; Jim Stephens, EMO; Aaron Jopson, Watercare)

Date: June 22, 2008

Re: Review of Auckland Region Generator Resources

Attached is a report summarising the findings from this joint AELG-CEG project. The objective of the project was: *To assist Auckland utilities and emergency management agencies in making decisions on generator ownership and contract agreements by providing information on generator resource availability in emergency response situations and lifeline utility / CDEM needs.*

The key findings of this project are as follows:

a) At the time of the survey in March/April 2008, there were around 360 generators > 2.5kVA owned by the 5 main hire companies in Auckland. Of these, typically around 1/3 are in stock at the company depots at any one time. Around 50-100 additional generators could be sourced from other depots in NZ within hours. Around 500-1000 extra generators could be sourced within 1-2 weeks (typically from Australia).

b) If there was a region-wide power outage lasting 2 or more days (a worst case, but feasible scenario), utility and emergency management agencies would require around 150-200 generators to maintain essential services; this makes a small allowance for agencies that did not respond to the survey. It is noted that many other critical sectors will create additional demand for generators, such as medical centres and supermarkets.

c) Most utilities and emergency management agencies own sufficient back-up batteries or generators to maintain services during short-term power outages across part of the region, but will require additional generators if the outage is more widespread. In most cases there are no formal contracts in place with hire companies to ensure priority supply.

d) Generator hire companies did not have emergency prioritisation systems in place, most believing that Civil Defence would take control of allocating generators in an emergency. Similarly, many generator users did not have formal contracts in place, believing they will be able to rely on Civil Defence to get them priority access.

e) The ability to transport generators to site (ie truck availability), connect (electrical requirements) and re-fuel generators is likely to cause as much of an issue as sourcing them in the first place.

The project committee also note that:

f) Anecdotally, the generator stocks in Auckland are already stretched during business-as-usual, with one utility noting that for planned maintenance they are required to book large generators 3 to 6 months in advance. The utility also noted that in recent power outages they had difficulty locating suitable trucks to transport the generators to site.

The project committee recommends that:

1. The CDEM sector communicates to the generator hire, utility and emergency management sectors that they should have in place their own arrangements for prioritising generator allocation and sourcing generators in an emergency. CDEM powers are a last resort and are unlikely to be used except in very extreme situations.

2. Each utility and emergency management agency review its preparedness for widespread electricity outages taking into account the findings of the report – including generator ownership / hire agreements, ability to quickly connect generators on site and transport and re-fuelling arrangements (checklist appended to report).

3. The Auckland EMO holds the generator survey and emergency contact lists for use in an emergency (noting that the generator survey response details were provided on the basis of maintained confidentiality).

4. Auckland CDEMG consider further investigation of:
   - emergency generator demand from critical industries beyond the utility / emergency management sectors, such as the Fast Moving Consumer Goods industry.
   - fuel tanker companies' contractual / commercial arrangements in case of a long term power outage.

Auckland Engineering Lifelines Group (AELG) / Civil Defence Emergency Management Group (CDEMG)

Auckland Region Generator Resources Review

Presented By:

Ton Hulsbosch and Nyree Osieck, Management Toolbox Limited

April 2008

Contents

Background

Management Toolbox was commissioned by the Auckland Engineering Lifelines Group (AELG) / Civil Defence Emergency Management Group (CDEMG) to provide detailed information on generator resource availability in emergency response situations and lifeline / CDEMG needs.

The purpose of this information is to assist Asset Utilities in making decisions on generator ownership and contract agreements.

Through a detailed survey and subsequent interview process the following information has been captured and is included in this report and appendices:

- A summary of the generator requirements of lifeline and emergency management organisations (Police/Fire/Ambulance/Health) to maintain service continuity in a widespread power outage.
- A list of the main generator suppliers / hirers in Auckland and key contact information.
- A summary of the generators available from suppliers / hirers in the Auckland region and the circumstances that surround them.
- An assessment of any gaps between generator resources available and those required to maintain essential services, including consideration of how quickly resources could be brought in from outside the Auckland region.
- An assessment of the level of guarantee the various agreements and contracts provide to organisations (i.e. to what extent they can rely on them).
- A description of how the major generator companies currently manage their supplier contracts and prioritise generator supply.
- Compilation of a checklist for organisations relying on backup generators and on site diesel stores.

Stakeholder Survey

General

Out of the 33 identified stakeholders, responses of varying detail were received from 32 (97%) organisations. The breakdowns of sectors are as follows:

Sector	No. of Respondents	%
Emergency Management	8	25%
Transport	6	19%
Public Health & Safety	4	12.5%
Fuel	4	12.5%
Telecommunications	4	12.5%
Electricity	3	9.4%
Other	2	6.1%
Water	1	3%
Total	32	100%

Specific Requirements

A total of 389 sites throughout 25 organisations were identified as requiring emergency generator capability[1]. The largest demands came from the telecommunications (52%), emergency management (14%) and water (11%) sectors.

16 organisations (50%) identified themselves as being self sufficient through either on site or owned portable generators, whilst 13 organisations (41%) identified a requirement for external generators[2]. A total of 152 external generators were identified as being required throughout the 13 organisations, and the majority of these came from the emergency management and water sectors. It is important to note, however, that whilst the emergency management organisations identified all of their welfare centres as requiring emergency generators, none of them believed all centres would be required at any one time.

Furthermore, the issue of technical readiness to connect external generators was also indicated by a number of organisations. This issue suggests that, despite the assessment surrounding availability of generators, further planning might be required to ensure the readiness of sites to utilise these generators.

[1] Seven respondents did not identify any sites which required emergency generator capabilities

[2] Three organizations did not respond to this question

A summary of the required external generators by size is as follows:

Generator Size (kVA)	No. Required	%
2.5 – 10	10	6.5%
11 – 69	25	16%
70 – 290	35	23%
300 – 750	40	27%
900 – 1250	8	5.5%
Blank or unsure	34	22%
TOTAL	152	100%

Only one sector identified an immediate requirement for external generators, with four organisations requiring generators within 2-6 hours, one within 6-24 hrs and one for longer than 24 hrs[3].

Contractual Arrangements

Very few organisations had a formal arrangement in place to provide emergency generators, opting instead for informal arrangements. When questioned about this decision, almost all organisations interviewed did not believe that a formal contract was worth setting up as Civil Defence would take priority in an emergency situation.

Transportation

Of those that require generator transportation, arrangements are in place for all organisations with a portable generator capability. Organisations that identified a requirement for external generators seem to be largely relying on the generator hire companies to also provide the generator transport.

Alternate route planning had only been undertaken by four organisations, with the remainder either not having considered it, or entrusting it to the generator hire companies.

Accessibility

The vast majority of the organisations that require external generator capability had identified sites and had confidence in the positions selected. One local authority noted that, although they have considered the issue and have identified potential sites, the decision would have to be made depending on the nature of the emergency and the weather conditions as there are not large areas of sealed and accessible land at some of their sites.

[3] Seven organizations did not respond to this question

Fuel

In the specific requirements section, only six organisations listed any sort of fuel storage capacity. However, a number of organisations stated in the fuel section of the survey that they kept on site generator tanks full, which are able to provide a short term capability prior to requiring external fuel supplies. All of these organisations regularly test and cycle over fuel to ensure on going diesel quality. Additionally, two organisations indicated the use of fuel additives.

Current Assessment

71% (10 out of 14) of organisations who responded to this question have assessed their requirements for emergency generators within the last 6 months, with all respondents having assessed it within the last 12 months.

The most important issues to respondents were refuelling and traffic congestion, with the least important being site access and fuel age (quality).

Supplier Survey

General

All five supplier surveys sent out were completed. A list of key contacts for each organisation is provided separately.

Contractual Arrangements

94% of the identified relationships are listed as informal, with only 6% having formal relationships. The breakdown per supplier is shown below:

	Supplier A	Supplier B	Supplier C	Supplier D	Supplier E	TOTAL
Formal	0%	0%	1%	4%	1%	6%
Informal	14%	29%	4%	14%	33%	94%
Total	14%	29%	5%	18%	34%	100%

Generator Stocks

A total of 366 generators varying between 2-2000kVA are currently distributed between the five surveyed suppliers within the Auckland Region. Furthermore, over 700 additional generators may be sourced from alternate suppliers either within NZ or overseas.

The summary breakdown of number of generator units per supplier is shown below:

	Supplier A	Supplier B	Supplier C	Supplier D	Supplier E	TOTAL
Owned	47	35	55	105	124	366
Available[4]	23	20	17	21	53	134
Leased[5]	24	15	38	84	71	232
Alternate	360	Variable	Variable	49	318-518	727-927
Within NZ	-	Variable	Variable	49	18	67
Overseas	360	-	-	Variable	300-500	660-860
Total	407	35+	55+	154	442-642	1093-1293

Prioritisation

80% of suppliers were confident they could satisfy all contractual obligations they have if there was a requirement. The remainder expressed some concern if all existing relationships were to call on emergency generators at the same time.

None of the suppliers had a formal policy on stock allocation; however, all indicated they would satisfy their existing customer base first. Four out of the five suppliers were of the belief that Civil Defence requirements would override any priorities they had made; therefore they did not believe there was much use in having a stock allocation policy.

Transportation

All suppliers have the ability to transport their generator units through a combination of their own transport fleet and external transport companies. Whilst all suppliers have considered alternative route planning to some extent, most thought that extensive planning is unnecessary as there are only a limited amount of alternate routes in the Auckland region.

Fuel

All suppliers have on-site diesel storage facilities and provide a refuelling service to client sites either via their own resources or through sub contracts. Only two suppliers have formal contractual arrangements for fuel, but all have a relationship either directly with a fuel company or with a fuel tanker company.

Additional Comments

In general, most suppliers commented on the learnings from the last major power outage in Auckland and had stated that they had managed to get through relatively comfortably and, therefore, were relatively confident that they could do it again if required.

[4] Average number of generators typically available at any one time

[5] Average number of generators typically on long term lease or rarely available for hire

Gap Analysis

Based upon the generator requirements identified in the Stakeholder Survey compared to the owned generator stocks available from five of the main generator companies within the Auckland region, notionally there should be adequate resources available to maintain emergency services/utilities. However, generator stocks within the Auckland Region fluctuate greatly depending on demand, as would the requirements of stakeholders and other critical industries. Therefore, it is difficult to establish a benchmark at any one point in time.

The below table demonstrates the required generators against the average number of generators typically available at any one time for the emergency services/utilities:

Generator Size (kVA)	No. Required	No. Available (AKL Region)
2.5 – 10	10	13
11 – 69	25	34
70 – 299	35	37
300 – 750	40	35
751 – 899	0	2
900 – 1250	8	9
1251+	0	4
Blank or unsure	34	NA
TOTAL	152	134

Consequently, on average, there would be adequate generators in all but one size category, with suppliers having to recall generators to cover requirements.

The only sector with an immediate requirement for emergency generators appears to have adequately covered their requirements through a formal contractual arrangement.

Emergency evacuee / welfare centres appear to be an area of possible concern for emergency generator requirements due to the unknown number which will be required dependant on the nature of the emergency. As a result of this, few arrangements have been made to cater for these through generator companies, with most relying on the ability of Civil Defence to source requirements.

Conclusion

Based on the survey feedback and what was learned from the interviews, it would appear that the general consensus among the stakeholders is that in the event of a prolonged power outage (24 – 48 hrs), most would "get by" through one or a combination of the following:

- Reprioritising their services (eg shifting requirements to bigger sites that have emergency generators in place).
- Using available generators to charge battery banks and then shuffle the batteries around the affected sites.
- Reassign their priorities and shutdown non-essential activities.
- Utilising hired emergency generators allocated to them by Civil Defence.
- Hire emergency generators from generator supply companies (either through formal or informal agreements). The expectation was that if Auckland hire companies' run out of generators, others would be transported quickly to Auckland from other parts of New Zealand.
- Borrow emergency generators from "sister institutions" outside of the power outage area.

Recommendations

The following issues, and subsequent recommendations, have surfaced during the course of the surveys and interviews:

1. There is a widespread view among stakeholders that Civil Defence has the ability to override hire companies stock allocation decisions (however at least one hire company was strongly opposed to this view).

   Recommendation: The authority of Civil Defence needs to be clarified and must be clearly communicated to all necessary parties.

2. Fuel will become the most critical factor in the continuing ability to maintain essential services. As part of this, fuel tanker companies have surfaced as a major factor in the ability of emergency generators to sustain long term outages.

   Recommendation: Fuel tanker companies' should be contacted to clarify their contractual / commercial arrangements in the case of a long term power outages.

3. During the interview process it became evident that the organisations who had undertaken external generator trials had detected a number of unforseen issues.

   Recommendation: Stakeholders should be encouraged to conduct trials of their emergency generator arrangements regularly and share learnings with AELG/CDEMG.

Appendices

1. *List of Survey Respondents*

Stakeholder Survey

Organisation	Name	Title	Sector
ADHB	Graham Ferguson	Emergency Planner ARPHS	Public Health and Safety
CMDHB	John Black	Engineering and Facilities Manager	Public Health and Safety
St John	Bruce Parkes	Emergency Planning Manager	Public Health and Safety
Waitemata District Health Board	Roger Jackman	Operations Engineer	Public Health and Safety
Vector Limited	Lloyd Wilson	Emergency Services Manager	Electricity
Counties Power Limited	Derek Todd	General Manager (Network)	Electricity
Transpower	Peter Wilkinson		Electricity
Chevron New Zealand	Iain Hamilton		Fuel
BP	Greg Tesar / Marcus Manning		Fuel
Shell	Ross Young		Fuel
Wiri Oil Services			Fuel
Vodafone New Zealand Limited	Peter Carr	Business Continuity Advisor	Telecommunications
Telecom New Zealand	Brigitte Theuma	Service Continuity Manager	Telecommunications
TelstraClear	Kevin Loasby	Business Continuity Advisor	Telecommunications
Kordia	Allan Mordecai	Manager Infrastructure and Property Group	Telecommunications
Water Sector	Brian Park	Risk Specialist, Watercare Services	Water
Ports of Auckland	Tomas Jonsson	Technical Manager Electrical	Transport
Bayes Coachlines Ltd	Richard Bayes	Operations Manager	Transport

NZ Bus Ltd	Garth Stewart	Manager - Business Development	Transport
Auckland Airport	Roy Robertson	Engineering Information Centre Manager	Transport
Transit New Zealand	Terry Boyle	Regional Asset Engineer (Auckland)	Transport
Air NZ	Peter Haliwell	Senior Business Continuity Management Advisor	Transport
Manukau City Council	Wade Harrison	Manager Emergency Planning	Emergency Management
Auckland City Council	Jamie Richards / David Crozier		Emergency Management
North Shore City Council / North Shore Civil Defence	Julian Dukes	CDEM Communications Project Officer	Emergency Management
Papakura District Council	Kelvin McMinn		Emergency Management
Waitakere City Council	Bill Morley		Emergency Management
NZRC	Peter Owbridge		Emergency Management
Franklin District Council	Ian Alexander		Emergency Management
Rodney District Council	David Cooper		Emergency Management
Auckland Regional Council	Paul Chambers	Project Leader Business Continuity Planning	Other
NZ Police	Mark Hall / Ross Henry	Snr Sgt Metro Police	Other

Supplier Survey

Organisation	Name	Title
Aggreko NZ Ltd	Tony Goodwin	Account Manager
Hirepool	Kingi Pikaahu	Hirepool Energy Manager
Hirequip / Powerhire	Jason Langlois	Area Manager
NZ Generator Hire	Laurie Roberts	Customer Service (AK Region)
Webster Group / Generator Power Ltd	Ralph Leaney	Co-Director

2. Checklist for Organisations Relying on Backup Generators

General						
Organisation						
POC						
Specific Requirement						
Site Name					Priority	
Details of external generators required:						
Size (kVA)	No. required	Generator load (kW/Hr)	Timeframe required	Generator connection available?	Technician required?	Refuelling frequency
				Yes / No	Yes / No	
				Yes / No	Yes / No	
Transportation						
Transportation arrangements made?	Yes / No	Details				
Alternate route planning organised?	Yes / No	Details				
Accessibility						
Site identified?	Yes / No	Details				
Is the site in a public place?	Yes / No	If yes, have you obtained legal advice?	Yes / No			
Have you taken into consideration: • driveway widths • overhead power lines • large trees	 Yes / No Yes / No Yes / No	 • noise emissions • security access • exhaust emissions	 Yes / No Yes / No Yes / No			
Fuel						
Do you have on site storage tanks?	Yes / No	If yes, has the quality of fuel been checked in the last 3 months?	Yes / No			
Have refuelling arrangements been made?	Yes / No	Details				
Generator Testing						
Has the generator been tested under load?	Yes / No	Details				