



31 August 2018

Dear 

Re: OIA request – power supply resilience reports

Thank you for your Official Information Act request received on 6 August 2018 seeking the following of Waitemata DHB:

- *I am writing to request any resilience reports from the past 24 months looking into mains and back-up power supply to the hospitals.*

In response, please see the following enclosed document:

- 'WDHB – Engineering Infrastructure Resilience Register', report prepared by BECA for Waitemata DHB, 7 February 2017. Please note that information in this report falling outside the scope of your request has not been included.

The Engineering Infrastructure Resilience Register has been developed to provide an assessment of what additional resilience should be added to our systems over time.

To date, we have had no major failing of our back-up power systems. However, to further strengthen the resilience of these back-up systems, the DHB commissioned BECA to do an independent assessment of how our systems could be further strengthened. We are now embarking on a programme of works to address these findings.

It should be noted that the assessment **does not** identify any risks of imminent failure. The risks that have been noted relate to the need to improve resilience; minimise possible adverse impacts; create capacity for required growth; and replace assets that are nearing their end of their useful lives. While some equipment is nearing end-of-life, all equipment is regularly maintained and tested and is in good condition.

Please note that areas of highest risk noted in the report are being addressed at the present time as part of the DHB's regular and ongoing programme of works to mitigate risk. In addition, a business case is being prepared for the Government for funding to undertake additional remedial work. The business case is currently under development and, if accepted, will allow this work to be carried out in 2019/20.

Please note the existence of another document within the scope of your request - 'Power generation status update', provided to the Waitemata DHB Board on 11 July 2018.

The information in this document relates directly to material covered in the Regional Long-Term Investment Plan (LTIP), which is due for public release in September.

On this basis, we have taken the decision to withhold the document under Section 18(d) of the Official Information Act as the LTIP will soon be publicly available.


If you wish to seek an independent review of this decision, you have the right to contact the Office of the Ombudsman, whose details are available via www.ombudsman.parliament.nz.

Waitemata DHB, like other agencies across the state sector, supports the open disclosure of information to assist the public's understanding of how we are delivering publicly-funded healthcare.

This includes the proactive publication of anonymised Official Information Act responses on our website from 10 working days after they have been released.

If you feel that there are good reasons why your request and this response should not be made publicly available, we would be happy to consider this.

Yours sincerely



Dr Andrew Brant
Chief Medical Officer & Deputy CEO
Waitemata District Health Board

Appendix A - Resilience Review Presented by Campus (Sheet 1 of 2)

Site	Risk No.	Date Rated	Risk Type	Risk Description	Entered by (person)	Risk Owner	Sources of Risk	Likelihood	Consequence	Approx length of outage	Initial Risk Rating	Current Controls	Likelihood	Consequence	Control/Consequence Rating	Risk Acceptable	Further Mitigation/ Treatment Plan	Status of Mitigation/ Treatment Plan	Due Date	Early Warning Monitoring	Target Risk Rating	Risk Trend	Next Review Date	Remarks		
NSH			Electrical	Essential power demand exceeds the generator capacity if one generator is out for maintenance or does not start. 2 out of 3 generators operational. No chilled water capacity is able to be easily connected to generator.	Facility PM	Facilities & Development	Facilities/Assets/Plant/Equipment	Possible	Catastrophic	Approx. 3 hours to get any power on essential load plus time to repair generator	High	Will need to manually switch off essential loads to allow the generators to start and remain operational.	Possible	Catastrophic	High											
NSH		10/2/17	Electrical	There is a single 3.3kV to 400 volt transformer (Sub3) supplying LV chillers. Failure of transformer or its associated HV supply will cause loss of cooling. We rely on 3.3 KV transformers are non standard and difficult to source for replacement.	Facility PM	Facilities & Development	Facilities/Assets/Plant/Equipment	Unlikely	Major	several weeks depending on availability	High	None	Unlikely	Major	High											
NSH		10/2/17	Electrical	MV-1 has three sections with two bus bars, each fed from a different transformer. TX-1 is running at full capacity so if either TX2 or 3 fail then it will not be able to meet the demand to replace the failed transformer or vice versa.	Facility PM	Facilities & Development	Facilities/Assets/Plant/Equipment	Possible	Major	1 week depending on availability	High	NB: Single line diagram is out of date and needs updating. Would need to load shed non essential and/or run generators to reduce the load to that which the transformers can meet	Possible	Moderate	High											
NSH		10/2/17	Electrical	There is a single transformer TX-3 supplying the single MV4 and plant room DBO (400V base load chillers and all pumps for all chillers). Loss of supply will result in loss of all cooling to Tower Block, some Geniatric and ESC. Switchboard is older but spare parts are held	Facility PM	Facilities & Development	Facilities/Assets/Plant/Equipment	Possible	Major	More than 1 week depending on availability and a design work around would be required	High	NI	Possible	Major	High											
NSH		10/2/17	Electrical	Some BMS modules are supplied from older 30 year old distribution boards. Failure of these BMS supplies would remove mechanical controls	Facility PM	Facilities & Development	Facilities/Assets/Plant/Equipment	Possible	Moderate	1 week depending on availability	High	NI	Possible	Moderate	High											
NSH		10/2/17	Electrical	A Single transformer serves the ESC building via MV-6. If the transformer fails a generator backs up the essential section of MV-6 only. Note we understand it is policy that medical operations would not proceed while on generator supply	Facility PM	Facilities & Development	Facilities/Assets/Plant/Equipment	Unlikely	Major	1 week depending on availability	High	Generator backup to essential side - review capacity of generator including planned future extensions to see if it has capacity to supply non essential loads on well.	Unlikely	Major	High											
NSH		10/2/17	Electrical	In general single sub mains serve Tower Block on floor DBs from rising main Tap off DB's are generally installed in pairs consisting of essential and non-essential, with no ability to cross feed from one to another. There are a few critical areas where a supply can be cross fed. In more recently built hospitals they have been cross fed between essential and non-essential sub mains with installation of changeover switches.	Facility PM	Facilities & Development	Facilities/Assets/Plant/Equipment	Possible	Major	1 day depending on nature of failure (say loose connection caused)	High	nil	Possible	Major	High											
NSH		10/2/17	Electrical	Diabetes and Marivato buildings are not supplied from the WDHB HV ring main. Those buildings are supplied from Stakepole Rd via separate LV feeders	Facility PM	Facilities & Development	Facilities/Assets/Plant/Equipment	Possible	Major	Vector outages could be general in nature or unplanned	High	NI - A power outage has occurred in the past which quite disruptive requiring patients to be relocated	Possible	Major	High											
NSH		10/2/17	Electrical	There is a single transformer and associated HV cable supplying the WSL pump house.	Facility PM	Facilities & Development	Facilities/Assets/Plant/Equipment	Unlikely	Minor	1 week depending on failure	Medium	Has a diesel generator backup if power fails WSL gets alerted and will bring in portable gen set to supply sewer pumps but not WDHB fire pumps. Fire service would need to boost WDHB fire water main from portable water supply.	Unlikely	Minor	Medium											
NSH		10/2/17	Electrical	There are single supplies from MV-1 to the significant Non Essential switchboards MV-2/AB. This was the original design intent that non essential power would be lost with a power outage, however modern hospitals have provision for more essential power capacity.	Facility PM	Facilities & Development	Facilities/Assets/Plant/Equipment	Unlikely	Moderate	1 week depending on failure	Medium	Essential power would still be available and staff would need to work around the available power (plug into red and blue sockets where available). Note also these boards have recently been replaced.	Unlikely	Moderate	Medium											
NSH		10/2/17	Electrical	The internal HV ring is operated by open change feeder cables in one section of the ring is lost - requires specific skilled technicians to implement this. Vector do this and have a maintenance contract but DHB is reliant on them to have trained staff to respond. WDHB don't have HV trained staff that can do switching.	Facility PM	Facilities & Development	Facilities/Assets/Plant/Equipment	Rare	Major	1 day for switching to be organised	Medium	Check current arrangements with Vector and their ability to respond. Some buildings (critical patient buildings) have Generator backup for partial supply backup	Rare	Major	Medium											
NSH		20/01/17	Electrical																							

Appendix A - Resilience Review Presented by Campus (Sheet 2 of 2)

Facility Management Risk Register																									
Site	Risk No.	Date Rated	Risk Type	Risk Description	Entered by (person)	Risk Owner	Sources of Risk	Likelihood	Consequence	Approx length of outage	Initial Risk	Current Controls	Likelihood	Consequence	Control Risk	Risk Acceptable	Further Mitigation/ Treatment Plan	Status of Mitigation/ Treatment Plan	Due Date	Early Warning Monitoring	Target Risk	Risk Trend	Next Review Date	Remarks	
Mason				Single MSB serves each building with both 400V normal and generator supplied power. Failure of MSB would render all buildings without any power.	Facilities & Development	Facilities & Development	Facilities/Asset/Plant/Equipment	Possible	Catastrophic	1 day to 1 week depending on nature of fault and response required	High	Nil	Possible	Catastrophic	High										
Mason	102/17	Electrical	Single sub main and circuit breaker from MSB serves each building. Failure in circuit or breaker would render one or several buildings without any power	Facilities & Development	Facilities & Development	Facilities/Asset/Plant/Equipment	Possible	Catastrophic	Within 1 day depending on nature of fault and response required	High	Some LPS supply to critical systems such as security. extent requires review. Consequence depends on the nature of fault and response required	Possible	Catastrophic	High											
Mason	102/17	Electrical	Single generator provides only backup to Vector. In the event of generator failure there is no backup power.	Facilities & Development	Facilities & Development	Facilities/Asset/Plant/Equipment	Likely	Major	Within 1 day depending on nature of fault and response required	High	Generator is critical and temp. repairs in maintenance required on the Generator	Possible	Major	High											
Mason	102/17	Electrical	Single transformer serves the whole site	Facility PM	Facilities & Development	Facilities/Asset/Plant/Equipment	Possible	Insignificant	Depends on Vector outage duration	Low	Currently generator can supply the whole site so 100% backup to incomm	Possible	Insignificant	Low											
Mason			Site has two generators each operating as a backup for the other. In the event of generator failure there is no backup power.	Facility PM	Facilities & Development	Facilities/Asset/Plant/Equipment	Likely	Catastrophic	1 week depending on nature of fault and response required	High	Generator is critical and temp. repairs in maintenance required on the Generator	Likely	Catastrophic	High											
WTH	102/17	Electrical	Backup to boiler house. Generator does not have plug in points available at boiler house in the event the generator needs to be taken offline	Facility PM	Facilities & Development	Facilities/Asset/Plant/Equipment	Likely	Catastrophic	Several days	High	Generator would require adaptation to back feed	Likely	Catastrophic	High											
WTH	102/17	Electrical	Single start emergency start has not been trialed under high building load to test switches and automatic controls under full load. In a real situation the generators may fail to start automatically	Facility PM	Facilities & Development	Facilities/Asset/Plant/Equipment	Likely	Major	within 1 day	High	If an auto start failed then starting of generators would be required with an extensive period with no power at all	Likely	Major	High											
WTH	102/17	Electrical	Main building MSB has bus ties with transformers serving each side. If one transformer fails then the remaining may be able to supply power to the remaining buildings	Facility PM	Facilities & Development	Facilities/Asset/Plant/Equipment	Possible	Moderate	1 week depending on nature of fault and response required	High	Requires review. May be addressed by load shedding?	Possible	Moderate	High											
WTH	102/17	Electrical	All planters are all supplied off non essential HV feed there will be no cooling available	Facility PM	Facilities & Development	Facilities/Asset/Plant/Equipment	Possible	Moderate	Depends on length of HV outage	High	nil	Possible	Moderate	High											
WTH	102/17	Electrical	Auto Transfer Switches for connection of generators do not have a bypass so are a single point of failure. If it fails all power supply will be lost to the building	Facility PM	Facilities & Development	Facilities/Asset/Plant/Equipment	Unlikely	Catastrophic	3 days to 1 week	High	nil	Unlikely	Catastrophic	High											
WTH	102/17	Electrical	Essential as it means power is not available for the duration of the outage (there is no provision for full generator backup). If the mains outage was a long duration the impact would increase	Facility PM	Facilities & Development	Facilities/Asset/Plant/Equipment	Likely	Moderate	Depends on outage time	High	Staff can manage load and change outlets to essential where required	Likely	Moderate	High											
WTH	102/17	Electrical	Single and Health West and Bldgs. 3, 5, 6 supply from the street with no generator backup. Failure of incomm means complete loss of power to those buildings	Facility PM	Facilities & Development	Facilities/Asset/Plant/Equipment	Likely	Minor	duration of outage	High	We understand these buildings are not critical radiant facilities hence low consequence assessment. Should that be not correct or this changes in the future then consequence should be revised	Likely	Minor	High											
WTH	102/17	Electrical	If there is a fault on the HV network WCHB will not respond and undertake any network switching required	Facility PM	Facilities & Development	Facilities/Asset/Plant/Equipment	Rare	Major	1 day	Medium	Review contract with Vector regarding response times	Rare	Major	Medium											
WTH	102/17	Electrical	In general a sub main or circuit breaker supplying an on floor DB fails, there is no way of cross feeding from essential to non essential or vice versa	Facility PM	Facilities & Development	Facilities/Asset/Plant/Equipment	Unlikely	Moderate	1 day depending on nature of failure	Medium	consequence depends on department affected	Unlikely	Moderate	Medium											
WTH	102/17	Electrical	MSB2 that serves Higgins and Boiler House and buildings to the North is supplied from a single transformer. This transformer is likely to rely on a single generator supplying essential circuit only. Non essential supply will be lost until transformer is replaced	Facility PM	Facilities & Development	Facilities/Asset/Plant/Equipment	Unlikely	Moderate	3 days to 1 week	Medium	Medium	Unlikely	Moderate	Medium											
WTH	102/17	Electrical																							