



# 111 CONTACT CODE CROSS-SUBMISSION

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## Contents

Observations and Confirmations .....	2
Standards Around Copper Line Removal .....	4
Standards Surrounding Backup Power Devices .....	5

## Observations and Confirmations

1. Copper lines have provided access to 111 services since the start of implementation of the 111 service in September 1958. By 1988, the 111 service was available on every exchange in mainland New Zealand.
2. Copper lines are/were the common defined method of contacting the 111 service.
3. Copper lines are powered from the exchanges, providing access to 111 during times of emergency or power outage. If emergency conditions such as fire prevented the use of the home telephone service, access was available from a neighbouring property.
4. In 99.9% of situations, the 111 service was uninterruptible, for as long as exchange batteries retained power.
5. The removal of copper lines, and with it the 111 service, places an obligation on the RSP and infrastructure provider to inform the consumer of the loss of uninterruptible access to 111.
6. The existing copper cable network, coupled with a non-powered telephone, is/was a reliable form of communication over many decades, including the Christchurch Earthquakes, and in rural/urban areas during weather conditions that cut power.
7. The removal of the copper lines, and the uninterrupted telephone service it provided is/has destroyed this uninterrupted phone service.
8. It is clear that the mobile networks are not always capable of withstanding the surge in communications during a regional or national emergency, or prioritising urgent or emergency calls.
9. Internet devices, that also supply telephony services through VoIP phones, or a re-synthesised POTS service through standard phones, is becoming the norm for Fibre and VDSL Services.
10. AC Uninterruptible Power Supplies (UPS) that provide AC power for computer equipment are not designed for small loads, and are inefficient at such load levels, with up to 90% of the power being consumed in keeping the UPS itself operating under those conditions, with further losses in the AC adapters powering the Internet devices.
11. Any backup system that will efficiently store and provide power to Internet devices during a power outage will be DC UPS devices.
12. It is standard in backup power design, to take the manufacturer's nameplate maximum rating as the power requirements. Even though initial actual power drain will be lower, the maximum rating is the one used in design, as peak instantaneous demands can be as high as the name plate rating.
  - a. In Vodafone's submission, this is 24 watts per device. i.e. 48 watts for the ONT and the Router.

- b. For a period of 12 hours, this calculates out to 576 watts, or the capacity of a 12-volt battery in a small-medium car. If calculated for lithium-ion batteries, for which only 80-85% of rated capacity is available, this requirement would be closer to 650 watt hours. This is 6.5 times the legal limit of 100 watt hours of Lithium-ion capacity within a single device that can be transported by air, sea, or road.
  - c. Therefore if you take nameplate ratings as a standard, the maximum time you could hope to guarantee is possibly 1 to 2 hours from new.
  - d. It may be possible to get longer run times, but it is not something that can be guaranteed, especially as the batteries age.
13. Lithium batteries are widely used in mobile phone, mobile phone power banks, tools, industrial uses, electric cars, and solar energy installations.
- a. All lithium-ion batteries are classified as hazardous materials and there are restrictions on consumer grade devices being shipped over 100 watt hours in capacity.
  - b. Battery packs made to accompany brand name devices incorporate Battery Management Systems (BMS) into the battery pack itself. Part of BMS is individual cell charge balancing and monitoring including temperature monitoring, and the ability to isolate a faulty cell. Many incorporate feedback systems to warn users of issues. More sophisticated systems for fixed or vehicular systems include real time monitoring by the manufacturer via the Internet.
  - c. There have been a number of house and business fires caused by lithium-ion batteries and/or chargers. Contributing factors include low quality or counterfeit cells, low quality chargers, and battery packs and chargers without BMS. An increasing concern in the industry is the number of counterfeit and used cells entering the New Zealand consumer market.
  - d. There are a number of lithium-ion power banks and backup devices made in China. Having conducted extensive investigation, no Chinese manufactured device tested or investigated to date meets basic BMS requirements.
  - e. Lithium powered devices over 100 watt hours, especially to be used in the homes of vulnerable people, would have to meet the following requirements:
    - i. Batteries disconnected until device installed onsite by professional installers.
    - ii. Unit would have to be fixed in place, so that end users could not move / abuse / or accidentally cover the device.
    - iii. The device would need to be monitored.

14. A 100 watt hour battery will at best have approximately 85% power available from new. By the time the device or batteries have reached its usable life, the capacity will be 60%. At 60 watt hours and name plate rated devices, this places a practical limit of 60/48 of 75 minutes.
15. This however does not include the requirement to power a cordless phone.
16. Nor does it address the situation where the router, and/or ONT and/or cordless phone are in separate locations in the house. In this instance, the backup power has to be delivered over the interconnecting Ethernet cable, which introduces further losses.
17. This would drop the practical limit for lithium-ion devices in the home to 60 minutes.
18. More than 60 minutes may be got out of such a device, particularly at the outset. However, the Commerce Commission are proposing is a standard, so this 60 minutes would have to be met at all times during its life, in all implementations, under all conditions.
19. To enforce a higher time risks shortcuts being taken in order to meet the standard with elevated risks and potential unintended consequences.
20. Note that commercial AC UPS devices with lithium-ion cells have entered the market in the last 2 years. However, these are restricted to commercial UPS devices intended primarily for data centre or server based installations and have full monitoring enabled. There are no domestic AC UPS devices containing lithium-ion on the market at this time.
21. Sealed Lead Acid / Gel Cell / AGM batteries are a proven technology, both lower and higher than 100 watt hours, but they suffer from being larger and heavier. However, there are no restrictions in use.
22. Longer backup time becomes relevant when power loss occurs while consumers are sleeping. It would make sense that consumers be alerted in the case of power outage.

## Standards Around Copper Line Removal

1. The responsibility for uninterruptible access to 111 services originated from the Government telecommunications body at the time.
2. When the telecommunications moved from sole Government ownership to private and Crown entity ownership, that responsibility was passed along with it.
3. Removing existing uninterruptible functionality for contacting 111 in an emergency or power outage should only occur if new functionality is put in place, i.e. like for like.

4. The entity responsible for providing copper line uninterruptible access to 111 cannot negate that responsibility, or pass on that responsibility, except by agreed contract.
5. The entity responsible for providing the copper line uninterruptible access to 111 can only withdrawal copper lines from a premise by being responsible for providing a proven backup communications alternative.
6. Where Internet capability has been added to give faster speeds or gain Internet access as an addition to copper lines, the obligation to provide 111 access is still with the copper line provider. The presence of an additional provider for Internet access in no way negates the responsibilities of the 111 access provider. For example, if a farm has Fibre or wireless Internet because of slow copper line speeds, responsibility of providing 111 access is still with the copper line provider. Responsibility should not fall on the Internet provider by default. If the copper is cut off, the responsibility is that of the 111 access provider.

## Standards Surrounding Backup Power Devices

1. The minimum defined backup time for any device, throughout the life of the device should be 60 minutes, throughout its life, and under applications. Higher times are welcomed, but not enforced.
2. The device shall be provided for installation in one location in the home, e.g. demarcation point.
3. If the Internet connection is of the type that provides a virtual POTS service, then standard digital phone can be connected at the point.
4. It should not be the responsibility of the provider to provide additional power backup for one or several cordless phones or provide additional power backup to cater for telephone devices distributed throughout the home.
5. The "At Risk" home owner should have a device that gives immediate warning of power loss or power outage. Irrespective of the length of backup power, there would be concern to waking up to a power outage and backup battery time expired.
6. Where a backup device is in the home of an "At Risk" person who has a medical condition, then the device must be connected to a monitoring service. In the event of a power outage, relatives or care givers can be alerted.
7. Monitoring should also exist, as to the state of the device, and expected backup time where feasible. In the event of battery failure or faulty device, this should also raise an alert.