

111 CONTACT CODE SUBMISSION

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Background

This submission is from Eric Donn, Technology Consultant and director of Sabre IT Ltd.

My involvement in electronics spans over four decades. During that time, I have designed and built numerous power supply, charging and measurement devices and equipment. This includes power backup devices. Furthermore, I have been involved in the commission, maintenance and monitoring of UPS power devices since the early 1990s.

Consequently, I am well aware of the shortcomings of many installations of UPS devices. This is due to a failure of proper design and unawareness of battery technology.

Most importantly, I have been acutely aware for well over a decade of the limitations of standard AC UPS devices, and the extremely poor efficiency at low power drains as happens with Internet devices.

Please note: I do not have shares in or any interest in any ISP.

Observations

1. Extended power outages, especially rural, happen during weather conditions that make marginal mobile phone communication impossible.
2. During regional disasters mobile phone networks become overloaded.
3. The following observations relate to the provision of power backup for the Internet, and Internet connected phones, and cordless phones.
4. I note the minimum requirement of 12 hours. I am well acquainted with power outages, including rural and urban, that have lasted days not hours.
5. If 12 hours is a standard, does this apply to all applicable situations and at any time during the life of the equipment?
6. Are we accepting "suggested backup times" submitted by manufacturers or vendors? Or is this an actual measurement, carried out in situ at the consumer's home? If this is a standard, it will create an administrative nightmare, and increase the cost many times.
7. There are many factors that will impact 'backup time' in any given implementation. Stating a backup time for a power backup unit is about as certain as stating the minimum range in kilometres that 50 litres of fuel will provide, in any car, under any use.
8. Battery backup time:
 - a. Is dependent on the number and type of connected devices, use of those devices, ambient temperature, and condition of the battery, among other things.
 - b. The length of time a battery will supply power is determined by the battery capacity.
 - i. The battery capacity is also affected by whether it has been pre-conditioned before use. Depending on type, unconditioned batteries may provide as little as 65 – 80% of full rated capacity, until charged and discharged a number of times. Typically batteries are NOT conditioned before use.
 - ii. The battery capacity is also affected by the life of the battery. As a general rule of thumb, a battery is considered expired when battery capacity falls below 67% of its rated capacity. Lower capacity means lower backup time.
 - iii. The life of the battery is affected by temperature. A battery at 30° C will have 50% of the life of a battery at 20°C, and a battery at 40°C will have 20-25% of a battery at 20°C. These are not ambient temperatures but battery temperatures, which will always be several degrees higher than ambient. This is especially the case if said equipment is tucked away in a cubby hole or wall cabinet.
9. The devices that may be connected vary considerably. The Internet connection may be via a roof mounted Wi-Fi dish with heavy power requirements. The cost of providing 12 hours power backup at any time during the battery life will run into thousands of dollars.
10. It would appear that the issues of costs and practicality were not considered before the legislation was passed.

11. A loss of life or permanent disability resulting in not being able to contact the 111 service, is a tragic event.
 - a. Not being able to contact the service because of power loss is one thing. In this event it is a case of the consumer not being prepared.
 - b. Not being able to contact the service because the intended backup device did not give the required backup time is another thing entirely. In this case it is a case of being prepared but being let down by the thing that should have been a saving grace.
 - c. To the family of the deceased, the outcome is the same, except that in the second case, the death was needless.
12. Under the circumstances mentioned above, knowing the actual backup time, rather than an assumed backup time, is far preferable even if the actual backup time is far less than an assumed backup time.
13. An additional concern is that if the provisioning of power backup is excessive, the RSP will find the cheapest possible solution. If this is the case, this will result in uncertain backup times and performance. It could also make smaller RSPs unprofitable or result in price increases for all consumers.
14. A proposed standard in the 111 Contact Code is that a backup unit will have to be checked every 12 months.
 - a. How will this be carried out?
 - b. Who will test a unit?
 - c. Who will bear the cost of testing?
 - d. What will it cost to arrive at the home and test the device?
 - e. Would it not be better to have it continually monitored?
 - f. How will that cost impact on the overall cost of the unit throughout its life and how this impact on the cost of providing the unit?
 - g. Will the ISP have sufficiently qualified personnel to be able to test?
15. All the preceding factors will substantially increase costs.
16. Personally, I would rather have 3 or 6 hours guaranteed backup time, than 12 hours of possible backup.

Who is responsible for the need for Internet backup power?

- 1) While this has been decided by the underlying law change, that the RSP will be responsible, I conclude that a number of questions were not asked before the law change. Since the law change that makes the RSP responsible irrespective of cost, we should ask who is actually responsible?
- 2) Please refer to Appendix A.
 - a) Causes B through to E predominantly rest with the power provider. Cause F rests with the ISP/homeowner.
 - i) Power providers are contracted to provide power to the power demarcation point in the home. What happens beyond that demarcation point is the responsibility of the homeowner.
 - ii) Internet providers are contracted to provide Internet Service to the demarcation point in the home. What happens beyond that demarcation point is the responsibility of the homeowner.
 - iii) My immediate questions are:
 - If the need for power backup is created by failures by the power providers, why does the responsibility for backup power in the event of a power failure then fall on the ISP?
 - Why not the power companies?
 - Why not shared with the power companies?

Observations and Recommendations

- 1) That the cost of providing a backup power unit to consumers with existing medical should be funded in the same way that medical alarm units are currently funded.
- 2) MSD currently pays for the provision of personal medical alarms for approved suppliers, or people opt to buy their own (privately funded).
- 3) For cases that do not involve medical risks, the backup device should be funded through the same agency that would normally provide assistance. RSPs or any private company should not be funding what is primarily a social welfare cost.
- 4) Outside of this, RSPs should be free to provide backup units at the consumers cost.
 - a) I believe that rural or semi-rural situations, pose a great risk area, so it is better that consumers get the protection they need at a cost
 - b) Rural consumers generally accept that living rural comes at a cost.
 - c) Power outage Cause A (see appendix), is created by mother nature. Under these circumstances everyone becomes an at risk person. In the interests of saving lives it is far better that consumers have backup power protection at their own cost than not have it because it was not supplied free by the RSP.
- 5) The 111 Contact Code needs to be reviewed.

Appendix - Power Loss Causes

A) Regional Level Outage

- 1) Regional, city, or rural area loss of power. Causes include natural disaster or extreme weather conditions, earthquakes, fires, floods, storms and excess snowfall.
- 2) Duration: 3 hours to 3 weeks.
- 3) Power Service Providers will be immediately aware of the issue.
- 4) Residents may be aware of the widespread nature of the outage if they communicate by copper lines, listen to the radio, or go onto the Internet from a device that can still access the Internet during the outage.
- 5) If it happens during hours of sleep, residents may not be aware of it until they awoken at their normal time. Those residents that have devices that that sound an alert during power loss e.g. normal AC UPS, may be alerted earlier.
- 6) Power outages in 1998 in Auckland CBD dragged on for a week, with continual outages over the next 2 months.
- 7) Multiple snowstorms, especially in the South Island, have resulted in power outages lasting days. This is of particular note, since during such weather, roads may be closed, mobile phone access out and no way for residents to communicate save via copper lines, or battery backed up VoIP or Internet.

B) Suburb Level Outage

- 1) Loss of power to one or more suburbs within a city or rural area.
- 2) May be due to similar causes as above, but may also be caused by a cable fault, obstruction on power lines, or power knocked out in a motor vehicle accident.
- 3) May be at a substation level only or one or more distribution points within that substation.
- 4) The Power Service Providers will be immediately aware of the issue.
- 5) Residents may be aware of the widespread nature of the outage if they communicate by copper lines, listen to the radio, or go onto the Internet from a device that can still access the Internet during the outage.
- 6) If it happens during hours of sleep, residents may not be aware of it until they awoken at their normal time. Those residents that have devices that that sound an alert during power loss e.g. normal UPS, may be alerted earlier.

C) Street Level Outage

- 1) Loss of power to one or more streets within a suburb, caused by a cable fault or obstruction.
- 2) There is no guarantee that the Power Service Providers will be aware of the problem until someone affected by the power outage telephones in the fault.
- 3) Residents may be aware of the widespread nature of the outage if they communicate by copper lines, or go onto the Internet from a device that can still access the Internet during the outage.

- 4) If it happens during hours of sleep, residents may not be aware of it until they awoken at their normal time. Those residents that have devices that that sound an alert during power loss e.g. normal UPS, may be alerted earlier.
- 5) If they assume that the outage is due to a suburb level outage or greater, and choose not to investigate, the outage may not be reported for some time. The bigger the number of houses affected the more likely someone will investigate.
- 6) I have seen the situation where a street level outage occurred in the evening. Concerned home owners observed that lights were out in all homes in the street as well as street lights, so everyone assumed it was a suburb level outage and therefore the Power Service Providers would be dealing with it. Several hours elapsed before the first call was placed with the Power Service Providers.

D) Externally Caused Home Outage

- 1) Loss of power to one or more homes caused by a cable fault or pole fuse.
- 2) It is almost certain that the Power Service Provider will NOT be aware of a problem unless someone affected by the power outage telephones in the fault.
- 3) I have seen the situation where due to power arcing in the wet, only one customer lost power due burnt out cable, but other homes had significant yet undetected power disturbances.

E) Internally Caused Home Outage

- 1) Loss of power to one home caused by overload, or fault within the home electrics.
- 2) The Power Service Provider will NOT be aware of a problem unless the resident locates or communicates the fault to the Power Service Provider, or electrician.

F) Internet Power Loss

- 1) This is a unique but common situation where the AC adaptor powering either the Fibre ONT or Internet router fails.
- 2) Neither the Power Service Provider nor Internet provider will be automatically aware of the problem. If the resident is not using the Internet when this occurs, they may be unaware of the failure.
- 3) Depending on the nature of the failure, residents may be using the Internet without being aware that they are using mobile data and not the local Internet Wi-Fi connection.
- 4) I have seen a situation where because of use of smart phones, the Internet outage and associated loss of phones was no detected for several days.