6 CONCLUSIONS & SUMMARY OF POSSIBLE OPTIONS

6.1 Issue #1 – Backup Power at Customer Premises

From the technical review and cost analysis performed in this investigation, the following options are provided for the consideration of the CPUC:

1. Battery lifetime at Customer Premises

   The choice of an acceptable or desirable battery lifetime can not be set independently of consideration of the service contract and maintenance agreement between the telecommunications service provider and customer. One of the more effective options for CPUC may be to help educate the customer to the pros and cons of backup battery ownership, care, and maintenance; so as to help the customer ensure the maximum lifetime is achieved for the battery at their premises. With these provisos, minimum battery life before replacement should be at least 3 years in the mild climate of California.

2. Battery backup reserve time at Customer Premises:

   - No minimum backup reserve at customer premises is required at this time: Such an option could be justified by pointing to the current practices and contingency plans by service providers as adequate to provide emergency telecommunications services in the large majority of power outage situations. This option further assumes that competitive market forces will necessitate the deployment of significant battery backup at the customer premises.
   - Set a required minimum backup reserve at customer premises of 4 hours of emergency usage use or standby time. This time is for the telephone being available for emergency use, not 4 hours of talk time.
   - Select a design minimum of 8 hrs backup as the desired level for telephony at the customer premises for broadband services. That is a minimum of 8 hrs of the phone being available for emergency use or standby time. Based on current cited loads, these 8 hours of standby time will equate to 4-6 hours of talk time[60]. The 8-hr value at the customer premises can be considered as matching the recent FCC requirement of Order 07-177 for 8 hours reserve time to be present at Remote Terminals (RTs).

   If the 4- or 8-hr criterion is selected, the CPUC should also allow for mitigating circumstances that provides an exemption to the 4- or 8-hr requirement. In this case, the CPUC should require that any such mitigating circumstances be documented by service provider with their contingency plans for their customers. Examples of acceptable possible mitigation reasons could include (i) documented high economic burden to provider and to customer when they need to replace with, or add, high-capacity battery backup, or (ii) documented unacceptable increase in loading of toxic or hazardous materials (e.g., lithium, cadmium or lead in batteries) in residence or building – possible compliance conflicts with EPA or OSHA rules.

[60] The quantitative relationship between standby time and talk time can be significantly affected by operational factors of the network, component device choices within the set-top-box, backup battery age and quality, and other factors. Reader may refer to Section 4.2.1.3 for more detailed discussion of talk time versus standby time.

3. Require that a battery monitor and status system be present at the customer premises with options for:

   - an audio signal with variable volume control,
   - a static or blinking light system to indicate battery status and low battery, and
   - a service for text or voice message being automatically sent from battery monitoring system to device.

4. Encourage the offering of optional services by service providers for disabled or other disadvantaged Californians with:

   - possible low-priced optional service for additional battery capacity, and/or
   - low cost backup basic service as additional service to customer (e.g., cell phone wireless service for emergency backup if their wireline service goes down).

5. Encourage customers and service providers to use low-energy using equipment with energy-saving sleep, idle and standby operational modes.

6. Expand the customer education outreach and initiatives using the CPUC's "Consumer Education Information" website (http://www.calphoneinfo.com/) and other education means (e.g., bill inserts, brochures, website links, with selected items from the suggestions provided in Section 4.2.3.5.)

6.2 Issue #2 – Emergency Notification

1. The results of the commission's investigation suggest that standardized notification systems or protocols should not be required. Furthermore, this investigation suggests considering the recommendations of the carriers outlined during the proceedings to allow national standards in the area of mass wireless notification to unfold fully before considering CPUC actions. To standardize is in effect mandating the requirements of the systems being used by the various municipalities, counties and universities within the State of California.

2. The State of California OES should consider hosting a workshop to draft an optional set of minimum and model criteria for notification systems. This is not a set of standards, but rather an effort by the State to leverage the procurement and operations experiences of local notification system alert initiators within the State, and pass that information along to others. At the individual discretion of the various institutions with notification systems, this set of optional criteria could be utilized during their Request for Quote (RFQ) procurement process and implementation of notification systems. Such criteria should consider the needs of persons with disabilities[61], delivery of TTY (teletypewriter) messages and operational guidelines for the notification systems.

3. The State of California should consider promoting more communications between the carriers, local notification system alert initiators, and vendors. The State of California may wish to request that the predominant local carriers (i.e., AT&T and Verizon) work with the local notification system alert initiators and vendors to provide a single point of contact, knowledgeable in the

[61] See Appendix S – "Issues Affecting Consumers with Disabilities" for a list of voluntary criteria for notification systems provided by the Disability Rights Advocates

aspects of notification systems, to (i) work with the originators of emergency notification messages to educate them on the carriers concerns, and (ii) work with the notification system vendors, and alerting agencies, to develop a mutually agreeable set of guidelines for system installation and operation in order to minimize any impacts on the network.

4. The CPUC should consider, in conjunction with OES, promoting a public education campaign by a coalition of public safety, emergency management, private sector, and volunteer organizations to inform the public of the existence of the emergency notification system(s) and how such systems function. There must be outreach to inform people of the need to register their non-traditional communication devices, such as TTYs, Internet phones, wireless phones, and pagers with their local alerting entity. People with disabilities and other groups (e.g., those with limited English language proficiency and college students) should be specifically targeted..

5. The carriers have adopted a position in the area of mass wireless notification to allow national standards unfold, and to follow the lead of the FCC. The investigation suggests that the CPUC may wish to consider following those suggestions or at least allow these federal efforts to fully unfold before considering initiating further CPUC actions in this area.

6. While it is possible, the investigation did not find evidence that the random activation of notification systems caused congestion sufficient to hinder emergency communications. Other activities (such as mass dialing of E-9-1-1 during a catastrophic event) are more of a hindrance. Furthermore, through an education process, local notification system alert initiators could be made aware that they may need to throttle back their system in order to lessen any impacts on the carrier's network infrastructure. The CPUC may wish to encourage communications between the upstream service provider local notification system alert initiator occurs regularly.

6.3 Issue #3 – Backup Power at Network Sites

The current backup reserve capacity and design criteria used for RT and CO facilities have proven successful in providing emergency telecommunications in more than 95% of power outages. The large majority of customers in California are served by providers who comply with the NRIC Best practices. The costs to harden network facilities further with increased fuel supplies at CO sites would require larger fuel tanks with commensurate environmental safeguards and hazard reduction protocols. The additional costs of such increased fuel capacity are far greater than the alternate approach of having an efficient fuel delivery schedule and contingency plans in case of an emergency.

By a similar reasoning, the cost of permanently adding battery capacity at a remote terminal is far higher then having a contingency plan for delivery of new batteries or portable generators to critical sites in the case of a long term power outage or emergency. The probability of the additional battery capacity being needed over the lifetime of the cabinet or the lifetime of the battery is small.

This review recognizes the currently implemented industry best practices for back up power at RT and CO facilities:

1. 24 hours fuel storage at the central office facilities with contingency plans to enable rapid supplying of new fuel as needed, and
2. 4 hours (minimum) of backup reserve capacity at remote terminals with an objective of 8 hours at critical sites.

If the CPUC decides to require minimum backup times, they should also allow for mitigating circumstances that may prevent achieving the desired objectives. Regulatory compliance conflicts can easily arise with EPA rules, local fire codes, hazardous materials loadings and building safety rules. Many remote terminals may be located in restricted right-of-ways, prohibitions in lease agreements, have limited floor loadings on roof tops, or have other restrictions that limits the adding of heavy batteries with toxic compounds to the site. In addition, a wireless company may have flexibility at antenna sites that may entail boosting power of adjacent RT sites to enhance coverage area or having roaming agreements with other carriers. For a CATV company or telephone company, acceptable contingency plans may entail rapid response repair crews that can be dispatched for rapid restoration of service or some other emergency response plan to re-route traffic and maintain service.

The CPUC can consider require that any such mitigating circumstances be documented by service provider and for the service provider to show that an emergency plan is in place to augment the backup powering capacity at these affected sites. The CPUC should strongly consider providing flexibility to service providers to allow for software engineering and network re-configuration as a response to emergency. For example, a provider could reconfigure the network and flow of calls in the virtual switch (PTSN) world rather than force an engineering solution of hardening all the site nodes. Physically hardening all the site nodes with additional capacity can be expensive with duplication of costs for batteries, duplicate circuits and generators.

6.4 Issue #4 – Compliance to NRIC Best Practices

The level of participation and responsiveness of service providers to information requests on NRIC Best Practices was excellent. Generally, providers have high implementation rates (90% or above) of the NRIC-VII Backup Power Best Practices. Small LECs, as a single group, were lower than those for the other service providers. The difficulty that smaller LECs have seems to be rooted in the capital costs associated with additional batteries, generators and other backup hardware.

1. Encourage small LECS to seriously consider implementing the NRIC-VII Best Practices so the statistically significant gap in the implementation of Best Practices between them and the larger LECs will narrow.
2. Encourage all service providers in California to continue participating at:
    - FCC-sponsored forums for Best Practices (e.g., the CSRIC Focus Group on Best Practices when it is activated) or
    - Other industry-sponsored forums involving with the review and implementation of Best Practices (e.g., the ATIS NRSC).

The industry group noted above as *Small LECs* above fall under an exemption to the FCC recommendation described in Section 3 for back up power (in CO 24 hrs and 8 hrs for remote) for utilities. The FCC exempted smaller carriers because of the financial burden it might impose on them.

The high capital costs of implementing NRIC Best Practices were cited as the main hurdle by the *Small LEC* industry group that provided the response to the CPUC questionnaires. Since the majority of these smaller carriers reported as an industry group and not as individual companies, it is not possible to provide a definitive gap analysis of how difficult or costly it would be for these various small companies to meet the critical backup power requirements of the NRIC Best Practices and the proposed FCC criteria of Order 07-177. The CPUC may wish to consider a case-by-case analysis to identify for these smaller carriers what incentives and mechanisms should be used to effectively and efficiently encourage improvements in their backup capacity and contingency planning.

6.5 Issue #5 – Fuel Cell Backup Generators

A system of diesel generator and batteries is more efficient and economic at present. Without external grants or incentives, the high initial expenditure of zero-emission fuel-cell systems with associated hydrogen storage needs, the economic business case and return-on-investment calculations are not attractive.

1. The CPUC can consider encouraging use of clean diesel in these backup generators to help reduce the harmful emissions.
2. The CPUC may also be able to use its influence to encourage programs of rebates and grants that may be able to help facilitate field trials of alternate energy including fuel cell, solar and wind sources. However, such actions may be beyond the immediate scope of the CPUC mandates and would need to be done in concert with other state and federal government agencies (e.g., DOE, EPA, and DHS).