I recognize that the transition from analog, circuit-based telephone networks to IP-based networks is inevitable. I have read the FCC’s proposal to require carriers to make available backup power for individual consumers that lasts for 8 hours, and within 3 years make available equipment that lasts for 24 hours.

I believe this emphasis by the FCC is misplaced.

The current copper-based telephone networks generally depend on DC power from the serving central office. As long as the line is physically intact, an end user can place and receive telephone calls, including calling 911. This system has worked well for decades.

In contrast, the IP-based infrastructure not only requires injection of power at the user endpoint (which the FCC is trying to address with this proposal) but also generally requires multiple injections of commercial power at equipment nodes between the central switching center and the end user. If any of those power injection points is not supplied with power, communications to/from from the end user are no longer possible, even if the end user’s telephone equipment is being supplied with backup power as the FCC is proposing.

It should be noted that these power injection points not only cover residential network service; they also cover the backhaul services for cellular networks. The author is personally aware of failures in cell site backhaul circuits during Hurricane Isabel due to backup battery exhaustion at intermediate power injection points, leaving otherwise-operative cell sites unusable due to lack of backhaul connectivity.

In the limit, lack of suitable backup power for intermediate power injection points could result in a situation where a jurisdiction several hours into a large-scale power outage could find that its 911 capability is severely compromised, NOT because the 911 equipment itself is faulty but because a substantial portion of the population has NO connectivity, either through copper/fiber or cellular systems. This is completely unacceptable; no amount of ROI can justify establishing such a risk.

From these facts I believe the FCC should shift its focus from the end user to these intermediate points by doing the following:

a. Require service providers to provide necessary backup power equipment at all power-injection points to maintain that injection point for not less than 72 hours, and establish/maintain refueling/service contracts to ensure that the power injection point continues to operate for not less than 60 days after loss of commercial power. Make the cessation of copper service in an area conditional on ensuring that these backup power sources are installed and have been verified to be operational, with penalties for false statements.

b. Require service providers to identify suggested backup power systems for their equipment, but NOT to provide or maintain it. That burden should rest with the customer alone. Third-party providers can easily step into this space; the more innovative of them will provide solar-based backup solutions that will provide backup power indefinitely. This type of innovation should be encouraged.
c. Develop with other Federal agencies and the Congress as required suitable legislation / regulation to ensure that (a) power injection points shall be supplied with permanently-installed backup power, and (b) physical space for such backup power shall be made available, overriding local regulations and private covenants as required, and requiring property to be surrendered under eminent domain if no other arrangement can be arrived at. Strike a reasonable balance between the rights of private property owners and the absolute requirement to maintain communications capability.

Since at this time the most readily available backup power sources are generator-based, the legislation / regulation should specifically allow such sources; any EPA or state / local regulations prohibiting the regular testing and use of such backup power sources should be specifically set aside. The environment is important, but not more important than the lives of US citizens.

Since requiring providers to provide this capability is a change to their business plan, some kind of diminishing tax credit arrangement or similar should be included as part of the regulation, along with traceability of expenditures, to allow providers to move expeditiously on providing backup power sources expeditiously to enable them to move to IP-based services sooner rather than later. Part of the qualification for the tax credit should be a validated refueling plan / contracts with at least one primary and one secondary fuel provider, and arrangements with the local jurisdiction that, subject to personnel and equipment safety, refueling missions will be treated as mission-critical.

d. Conduct research (either directly or through FFRDCs or other similar entities) into the most effective design, outfitting, and packaging of solar-powered power injection systems for the transport technologies currently used or planned for the future. This could take numerous forms (including possibly a contest or fly-off between various proposals, with monetary prizes for the most effective solutions).

e. If suitable solar-powered backup power solutions are developed under (d), use the powers developed in (c) to allow and incent service providers to exchange generator-based backup power solutions for solar-based backup power solutions.

The short-term goal is to ensure that the transition to IP-based networks is accomplished without putting the population at risk. The longer-term goal is to maintain this condition while, if possible, phasing out generator-based backup solutions in favor of solar-based or other renewable-based energy sources.

Thank you for the opportunity to comment on this issue.

David A. Maples, P. E.