Comments by Jeff Allen of the Community Wireless Emergency Response Initiative

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When Hurricane Katrina struck, I was in Guatemala pursuing a new career in international disaster relief. I came home from there to work in Mississippi because I could see that my own country needed my skills. Though I am a trained Red Cross Disaster Services worker, I chose to work with Radio Response because I could see that a community wireless project would make the best use of my 10 years of IT industry experience. I am here representing a coalition of groups made up of the Community Wireless Emergency Response Initiative, Radio Response, and AidPhone. I worked in Mississippi for 6 weeks altogether. For the first two weeks, I worked with the initial group of volunteers. When the first wave of leaders returned home, I stayed in Mississippi and became the on-site project manager.

Community wireless worked, and provided a valuable service. We used donated bandwidth, equipment, and volunteer Internet engineers to build and operate a network spanning 40 miles with 20 customer sites. Our customers included government services, non-profit relief efforts, and public Internet labs. While citizens used the Internet to help rebuild their lives, our real impact was making other relief efforts more effective. We estimate that thousands of people have used the Radio Response network, and continue to use it today.

We found that deploying a community wireless network in this context worked, and that we were providing a valuable service. The Part 15 rules for the use of unlicensed spectrum made our work possible, but we had some problems too. I'm going to tell you what worked, and what help we need to make it work better next time.

The community wireless movement has been celebrating successes around the nation and around the world for some time. However, the networks we built after Hurricane Katrina were the biggest ever built in disaster areas. Out of this new experience, the most important thing we learned is that the technology worked, and we were providing a needed service. Our network carried web pages, email, telephone calls, and video out of the disaster area. Our users were emergency response personnel, citizens displaced by the storm, and volunteer workers. Our *Easy access to volunteer IT experts and to a free, nimble Wireless ISP acted as a force multiplier.* network and our presence as expert IT workers acted as a force multiplier, making other professionals more effective at their specialty. For instance the Calvary Churches used the Radio Response network to organize food deliveries and replacement relief workers. Carolina's MED-1 field hospital coordinated deployment and, eventually, demobilization plans using the Radio Response network.

Part 15 devices gave us the tools to build a nimble network in the face of difficult and changing conditions. The unlicensed spectrum Part 15 devices make use of allowed companies to restore service faster, empowered communities to help themselves, and made emergency responders more effective.

Another thing we learned is a well known mantra: preparation pays off. We were not prepared, and we paid the price in terms of our effectiveness. We achieved our goals, but it took too much time and too many people to do so. Private and corporate donors have approached us asking how they can help us be

more prepared for the next time we are called out. I hope in the future that community wireless emergency response projects will organize themselves around the country like Amateur Radio Emergency Service (ARES) teams or the FEMA-chartered Disaster Medical Assistance Teams (DMATs). We also learned that we need certain software technologies to be more effective. These technologies can be developed by volunteers using the Open Source model. The Community Wireless Emergency Response Initiative will encourage and support this development.

Part 15 rules made our work possible, but in some ways made it harder.

The Part 15 rules governing the use of unlimited spectrum made our task possible, but sometimes they made it harder too. There were three ways Part 15 made our task easier. First, we had easy access to cheap hardware due to the huge investment the private sector has made in this technology over the last decade. Second, because we did not need to devote effort to paperwork for licenses, we had more people doing more productive work, more quickly. The FCC made amazing efforts to turn around emergency licenses quickly, but we were still relieved not to have to burden our team, or the FCC, with requests for emergency licenses. Finally, the third way that Part 15 helped us was by giving us several bands and several radio technologies to choose from. These options gave us enough room to find an engineering solution even in the face of difficulties.

Part 15 also posed two problems for us. First, the unlicensed spectrum became crowded by the multitude of users in some locations. For example, the 5.8 GHz spectrum in Gulfport became incredibly crowded in the days after the storm. This is actually further indication that unlicensed radio technology played a critical part in restoration efforts. The spectrum filled up with commercial users restoring damaged traditional circuits with Part 15 devices. We wasted significant time and ended up unable to use our 5.8 GHz equipment due to the noisy conditions. Another problem with the spectrum is that the power levels and bands available to Part 15 devices are not ideal for emergency restoration work. For instance, we had trouble getting a signal through foliage, even in the 900 MHz band. To get over the foliage, we would have needed high vantage points. With our limited resources and limited time, we had to work with the heights available to us on building roofs. Giving Part 15 devices access to other bands with different propagation characteristics would help make wireless links easier to make under more diverse conditions.

Unlicensed spectrum became crowded due to a multitude of commercial and government users.

We need to work together to educate emergency managers about the benefits of unlicensed spectrum and community wireless networks.

A lack of education created the second problem. Unlicensed spectrum and the benefits of community wireless projects are not well understood by emergency managers. A public safety frequency coordinator threatened to shut us down because he was concerned we could interfere with WQRZ-LP's studio-transmitter link. The channels were merely adjacent, not overlapping, so it was only a perceived problem, not a real one. Access to city water towers was difficult to obtain because there was no pre-disaster understanding in the minds of the local officials of the value of wireless networking. One government-funded wireless project attempted to assert priority over us because they were serving public safety customers. With a bit of negotiation, our networks ended up coexisting just fine. The solution is simple: we need more education to raise awareness. The community wireless movement is committed to building ties to emergency responders. We'd like to see FEMA emergency response training incorporate awareness of the benefits of the unlicensed spectrum, and the proper procedures for coordinating government and private-sector users of Part 15 devices.

I'd like to leave you with three points to remember. First, we proved that community wireless works in a disaster area and provides a needed service to citizens and to relief workers. Second, easy access to volunteer IT experts and to a nimble Wireless ISP acted as a force multiplier. And finally, by expanding the unlicensed spectrum and investing in preparedness and education, together we can be ready to provide even more services, more effectively, in the future.

Thank you for giving the community wireless movement a voice in these proceedings.

Jeff Allen has worked ten years in the IT field, most recently with Tellme Networks, doing large-scale Unix administration and cutting-edge VoIP deployment. He has worked on wireless networks in Guatemala and was the project manager for Radio Response, an organization that created a community wireless network in Hancock County, Mississippi after Hurricane Katrina. Jeff is now in search of his first humanitarian aid field logistics posting. He can be contacted at jra@nella.org.