

Federal Communications Commission
Independent Panel Reviewing the Impact of Hurricane Katrina on
Communication Networks

Additional Comments/Clarifications by Tusa Consulting Services, Inc.

A number of issues involving fuel sources, Project 25 and 700MHz interoperability were raised during the morning and afternoon sessions that require comment and further clarification. Some were asked as questions to other presenters during the 3PM session but were not directed toward myself. Yet, I believe my direct experience with the design and emergency restoration of the City of New Orleans 800MHz radio network may be of benefit here, so the following supplemental information is now offered for the Panel's further consideration.

Generator Fuel Sources

By far, natural and Liquefied Petroleum Gas (LPG) was a more reliable generator fuel source as compared to diesel. The City's primary simulcast transmitter site, Energy Centre, is fueled using only natural gas and fuel service was never disrupted during or in the aftermath of Katrina. By contrast, diesel fueling was a constant problem for those sites equipped with diesel standby generators.

Generator Life

Standby generator systems are typically designed to sustain a loss of commercial power for possibly a 48-72 hour period. They are not designed for continuous, co-generation service. By contrast, most City transmitter sites operated on generator power for nearly 8 weeks. The simulcast network's control point operated for 133 days under emergency conditions. Once a standby power generator has accumulated this magnitude of service hours, it is no longer suitable for life-critical operation and should be retired from service. Unfortunately, the City's dire financial circumstance, post-Katrina, has prevented the replacement of this critical equipment in time for the 2006 Hurricane Season.

Confusion Between Project-25 and Software-Defined Radios

Many have the impression that use of Project-25 radio equipment guarantees interoperability with federal, state and local-area public safety resources. **That is a very wrong assumption.** Project-25 defines a set of standards for digital

radio system functionality. But, it does not address the fact that Today's 700/800MHz user radio devices cannot span to the lower frequencies, 512MHz and below, that are commonly used by the US Armed Forces, Federal agencies and most public safety agencies.

That being the case, the inability to communicate with operations from users of lower-frequency networks requires the implementation of interoperable radio-infrastructure gateways. Base stations/repeaters must be installed using nationwide interoperability channels in VHF, UHF, 700 and 800MHz bands. The State of Florida is conducting such an initiative, now, and should be contacted by the Panel to gain a better understanding of this valuable concept.

700MHz

Often, people describe the future arrival of 700MHz spectrum as the solution to all problems in the world of public safety communications. For those top-50 cities where there is a shortage of 800MHz radio spectrum, 700MHz allows a mechanism for much-needed expansion. But, the spectrum itself, for voice radio communications, offers no benefit over that which can be accomplished now on 800MHz. The propagation characteristics of the two bands are nearly identical and once 800MHz rebanding occurs, the convergence of 700MHz and 800MHz bands into single radios will become more the rule rather than the exception.

The true benefit of 700MHz is the availability of wide-bandwidth channels that could potentially support private wide-area, higher-speed (400kb/s) data systems....a technology that is not possible using narrow voice channel bandwidths.

There is no benefit to abandoning 800MHz spectrum, in the pursuit of 700MHz, as fully digital Project-25 networks are being deployed on 800MHz now. And, in time, the two bands will effectively merge into one.

700MHz Interoperability

The same issues for interoperability that now exist on today's public safety bands, 800MHz and below, will in the future exist at 700MHz. There is no radio available, **from any radio vendor**, that provides officer-to-officer interoperability to systems in bands below 700MHz. That means a buyer of a 700/800 MHz radio system, today, must include audio-patch technologies to link systems together. And, once 700/800MHz radio users leave the coverage area of their radio network's fixed infrastructure (towers and transmitter/receiver sites) the ability to communicate to those other outside, non-700/800MHz radio networks, ceases. There can be no outside-system interoperability if there is no host 700/800MHz infrastructure availability.

Much research and development is being made in the field of software-defined radios. These will have the ability to span multiple frequency bands and multiple transmission formats (analog, EDACS, OpenSky, Project-25, Smartnet II, etc.). But, the cost for this equipment is far too expensive now to achieve success in the cash-strapped public safety market.

In the immediate aftermath of Hurricane Katrina, several days after the City had restored functionality to its 800MHz radio network, the State of Louisiana expeditiously deployed a 700MHz pilot system in the New Orleans area. As this new system operated on spectrum far removed from current 800MHz operations, and was totally incompatible with the City's existing and operational radio network, it held no value to City operations.

The City's 800MHz radio network supports over 4,000 radio units. The only way to utilize the State's well-intentioned 700MHz deployment was to re-equip all City public safety agencies with new, unproven 700MHz user radios onto a new radio infrastructure that was likewise unproven, untested, lacked credible engineering design and was potentially less reliable than the battered, but operational, 800MHz network.

Attempting to re-equipping the City's entire public safety radio fleet, during the height of the nation's worst natural disaster and without proper planning or training, was....aside from being incredibly short-sighted....a certain recipe for failure.

While the State of Louisiana may now have mechanisms in-place to solve many of the interoperability issues with differing radio networks and frequency bands, that capability was non-existent at least until the end of Year 2005. Ultimately, a regional 700/800MHz radio network will benefit all public safety agencies throughout the hurricane-prone areas of south Louisiana, however, sufficient planning must be taken to ensure network survivability and that it has the necessary capacity to sustain an acceptable grade of service (nearly zero call queuing) during peak-normal operations. Ideally, it should encompass a multiplicity of urban-specific subsystems sized to meet local-area needs, all integrated into a cohesive, interoperable network.

Dominic F. Tusa
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