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UNDERSTANDING THE MOVE TO DIGITAL; *Why Changes in the Field Are Pushing Analog-Only Out*

March 1, 2015 -- Fire is a field historically known for its early adoption of safety-oriented equipment, with few exceptions: In the case of radio communications, the industry has been slow to make the switch from analog to digital radios. But as cooperative emergency response and firefighting become more the norm than the exception, and as voice technology improves, the pace has quickened. The transition is now well under way, and for good reason.

In 2014, the vast majority of radio sales to fire professionals were for dual mode equipment. The reasons agencies cited for abandoning analog only equipment generally include one or more of the following:

The need for interoperability

We've seen expectations change very quickly because of the growing need for intra-agency interoperability. Demands for gear that meets P-25 standards for interoperability significantly drive the digital switch. It just takes one experience of being 'islanded' from other agencies during a mission-critical situation to understand the value of the digital, dual mode equipment.

Digital's in-the-field, over-the-air programming ability

Because of their frequent intra-agency cooperation, some fire agencies have experienced a significant benefit of instant and remote over-the-air programming that a digital system offers. The new equipment allows for networking at a micro and a macro level – an ability that also helps with interoperability.

Enhanced security

Digital offers a much higher level of security, thanks in part to the nature of the technology and enhanced by the use of reprogrammable system keys and the optional addition of layers of encryption. Although this level of security is not necessarily a requirement for fire professionals, it is a factor when working with law enforcement or undertaking emergency recovery efforts that require interoperability.



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Improved range

The voice clarity range of digital equipment is significantly better than that of analog, and because of the way digital works – translating voice via an internal VOCODER, transporting it via data packets and then retranslating it back analog audio – the integrity of a transmission’s audio quality is greater than over analog narrowband range.

Voice clarity issues of analog over narrowband

The Federal Communication Commission’s 2013 narrowbanding mandate has severely impacted analog radio functionality and the quality of an analog transmission range via narrowband has degraded. The move to very narrowband is already under way, and that final shift to digital terminals by the manufacturers will amplify the issues to such a point that very narrowbanding may be considered the final nail in the analog coffin.

Improvements in digital voice recognition and noise cancellation

The advent of digital was initially met with great industry eagerness, but the early digital radios performed poorly in real world use, where background noise is exceptionally high and unavoidable. Because of this, many users chose to transition from analog to digital slowly, choosing dual-mode radios in order to get the best of both. But in recent years the manufacturers – some more than others – have made significant improvements to what’s called “vocoder” software, and performance in complex audio settings is much better.

Ease of transition

Unlike some technology shifts, moving to digital is a smooth transition for the end-user. Digital equipment looks very much like analog equipment. This takes some of the “shine” off the new gear, but the consistency of the user experience is for good reason. The radio manufacturers understand that users don’t have time to fumble with buttons or to get used to changes to the interface.

Beyond the P-25 standards, there is no official word or any state or federal requirement that agencies fully transition to digital. Yet with the changing demands of the field, improvements in vocoder software, and the continuing narrowing of bandwidth, it is reasonable to expect that from this point forward, every agency will opt for digital equipment or, at minimum, dual-mode radio equipment.

-- This article was provided by the team at Silke Communications. Silke has been serving fire agencies for more than 50 years and its customers include wildland, rural and urban agencies in Washington, Oregon and California. It is known for its consultative approach to identifying the right system for the right application, and for its commitment to service and training after the sale. Learn more at silkecom.com.