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Challenges Fire Departments Face Upgrading Fire Station Alerting to P25 Digital

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Public safety communication interoperability has been a recognized issue for decades, and these days, it is made even more complicated by CAD and data interoperability. The first big push towards widespread agency interoperability started in 1989 when Project 25, or P25, came into existence.

P25 is a suite of standards developed by public safety professionals in North America for interoperable digital two-way radio products. The goals of the standards creation were to enable intra- and inter-agency communication, to provide user-friendly equipment to public safety agencies, and to establish a path for departments to transition from analog VHF and UHF radios to P25 digital radio systems.

Manufacturers of land mobile radio equipment can follow these standards to ensure their products are interoperable with other manufacturers' systems. P25 radios can also transfer data as well as voice for the increased use of GPS, text messaging and encryption. Departments and organizations moving to P25 radio systems benefit from interoperability between public safety agencies, something that is critical in large disasters and mass-casualty events that have a multi-agency response.

It's not just the handheld radios that need to be upgraded from analog to digital; fire station alerting systems also require upgrading to P25 protocols. For many departments, this is a massive undertaking. In this white paper, we'll discuss the challenges many departments face upgrading their fire station alerting systems from analog to P25 and some solutions to help them along the way.

Fire Station Alerting Solutions Can Be Expensive

One of the biggest challenges departments face in adopting an IP solution — and it is the main reason adoption has been slow in smaller departments — is **cost**. Many of the IP-based network fire station alerting systems are expensive. A department could spend $50,000 to $100,000 to outfit a single station with a CAD and IP connection that need to be installed to run a high-end alerting system.

Some ways that departments are getting around this extra cost for each station are by installing a pager or mobile radio with a speaker in the station to use as an alerting system, or by building their own homemade device to broadcast alerts throughout the station.

One new product on the market, the Prism-IPX Fire Station Alerting box, is a standalone station alerting system that offers P25 radio communications and 8 relays for a station at about the cost of a P25 mobile radio. If the station has compatible equipment, the company does offer upgrades to monitor analog systems as well as P25 digital, turn off appliances, open bay doors, turn on lights and start turn out timers.

It Can Be Difficult to Get Buy-In from Stakeholders

Change is uncomfortable, and decision-makers and stakeholders in the department may not understand the need to upgrade a department's station alerting system. This obstacle to upgrading an alerting system frequently accompanies concerns about cost, because many items are competing for fire department budget dollars. Upgrades to an analog fire station alerting system that is working — or at least mostly working — often get scratched in favor of new equipment and items seen as more immediately critical.

It is beneficial to include stakeholders from the beginning of the discovery process in upgrading the department's alerting system. Involving them in the process encourages buy-in and educates them about why the out-of-date system needs to be upgraded and should be considered critical.

Sharing the benefits of an upgraded system with decision-makers is also a strong way to convince them of the need to improve a station's alerting system. Some of the benefits a department could include are:

- **Radio System Reliability:** P25 fire station alerting systems are easier to maintain than analog systems because components for the more advanced digital technology are readily available. For many legacy analog systems that are 30 to 50 years old, replacement parts are either difficult to find or obsolete.

- **Reduced Response Time:** Upgrading to a P25 fire station alerting system allows faster communication between dispatch and the fire station. Older analog systems may have a slower relay and a loss of performance, which can cost precious time during an emergency.

- **Improved First Responder Health:** Newer P25 systems can be programmed to turn on the lights in different dorm rooms of the firefighters or medics.

- **Heart Smart Alerting:** It's been scientifically proven that repeated startle responses can contribute to higher cardiac risk over time, in addition to causing a long-term activation of stress hormones that can put a firefighter at risk of a variety of health problems. Also focused on improved first responder health, P25 fire station alerting systems can reduce the startle response when toning out a crew for a call by slowly increasing the tone volume, having different tones for different types of calls, and slowly increasing the lighting in the dorm rooms at night.

- **Station Controls:** Zoned alerting, heart smart alerting and increasing the lights in the dorm rooms are just a few examples of some of the station controls that can be programmed into a P25 station alerting system. The system can also open the bay doors, turn off appliances or start a count-up timer for the time since the call came in — new options are continually being added.

Frequently, fire stations and weather sirens are the last systems still on analog radio frequencies. One additional way to increase buy-in from stakeholders and decision-makers is to show them the long-term cost savings the county could achieve by moving the department to a P25 fire station alerting solution (and moving the weather sirens to a digital frequency). The county could stop paying for both analog and digital networks and could take down the old analog network all together.

The Time Frame to Move to P25 is Unclear

A department may not be sure when they'll be switching over to a P25 digital network. The changeover can take months of planning, approvals, infrastructure installation, testing and overlap to ensure there is no coverage interruption for citizens. Or they may know that they'll be making the switch in the next few years, but they aren't exactly sure when.

Some P25 fire station alerting systems can accommodate analog relays in addition to digital, so the station alerting box can be installed and will work with the department's current analog system until they move to the P25 digital network.

Some Network Solutions Require a Radio Backup

If a department chooses a network solution that is IP-based, it will often require a radio backup. Internet-based solutions work well until there is an internet outage. A radio backup ensures continuity of service for citizens.

Some P25 network providers offer an integrated radio backup as part of their fire station alerting solution. Another option is to choose a low-cost, radio-based alerting box as a backup that will kick in if there is an internet outage.

There May Be Additional and Ongoing Costs with an IP Based Alerting System

IP based fire station alerting systems can have high upfront costs, but it is also important to consider the ongoing costs of maintaining the system. Many IP based systems are complicated and require programming, services or connected products only available from the original system manufacturer.

Research programming and reprogramming costs before committing to a supplier. Is the department allowed to reprogram the system in-house? Consider annual maintenance and service fees, warranties and expenses for emergency service, should it be necessary.

Another area of potential cost savings to compare is whether the current station's infrastructure can be used or whether it needs to be replaced to work with the P25 station alerting system the department chooses. Some IP system manufacturers require the use of their lights and their speakers if you select audio and visual alerting. Depending on the age of the equipment currently installed in the station, with other providers, replacement may not be necessary.

Alerting Capabilities Can Vary Between Systems

Not all fire station alerting systems have the same capabilities. It is important for the department to set priorities for the station and members before deciding on a system.

A department may prioritize ramped-up lighting and increasing tones to prevent startling firefighters when a call comes in. They may decide the most essential feature is to have multiple tones depending on what type of call has come in. Especially if the station has separate dorm rooms for each firefighter, zoned alerting may be the top priority, so only those members needed for a particular call are woken at night.

Interoperability with Neighboring Departments Is Not Guaranteed

The original goal of Project 25 was public safety interoperability, so it is critical that departments that move to a P25 digital fire station alerting system can communicate with neighboring departments, even if those departments are still on an analog network. Neighboring jurisdictions need to be able to communicate in cases of mutual aid.

If a department has neighboring public safety agencies that are still on analog systems, they should make sure to choose a station alerting supplier who can accommodate relays using both analog and P25 Signals.

Fire departments that want to upgrade their fire station alerting platform from an analog system to a digital network face several challenges, many of which center on the cost of a new system. In addition to hardware and installation costs, a department also needs to calculate ongoing programming and service costs for the system they are considering.

Stakeholders and decision-makers may not see the value of upgrading a station alerting system, so it is important to involve them in the system selection process and to help them understand the benefits of a P25 digital alerting platform.

New features and functionality are continually being added to the various P25 systems. Determine the department's priorities before engaging the alerting system manufacturers so the team can share with vendors what the most important components are for a particular department or station.