



Village of Mount Prospect Fire Department



INTEROFFICE MEMORANDUM

TO: FIRE CHIEF, JOHN MALCOLM [REDACTED]

FROM: FIRE MARSHAL

DATE: NOVEMBER 18, 2011

SUBJECT: RADIO MONITORING OF FIRE ALARM SYSTEMS

Background

The Fire Prevention Bureau began researching radio monitoring after several other fire departments associated with Northwest Central Dispatch (NWCD) started using radios to monitor their fire alarm systems. Recent updates in radio technology, the increased cost of phone lines, and the frequent failure of phone systems has sparked interest in the feasibility of radio monitoring of fire alarm systems. Mount Prospect has approximately 350 fire alarms being monitored. The Village Code states that all required commercial fire alarm systems must be monitored. Currently, monitoring consists of either a central station or direct connection. Radio monitoring, however, is not permitted in the Village of Mount Prospect's current Fire Prevention Code.

Current Fire Alarm Monitoring Configuration

There are multiple types of fire alarm monitoring configurations used today. The two most common types are central monitoring stations and direct connections. Central monitoring stations receive signals from fire alarm panels via a phone line and then relay the information to NWCD. Central monitoring stations are owned by private companies and can be located anywhere in the country. In the case of a direct connection system, the signal from the fire alarm panel is directly relayed to NWCD by way of a reverse polarity phone line. A reverse polarity phone line is a copper phone line that continually sends a monitoring signal to its end user (i.e. a dispatch center). There are advantages and disadvantages associated with each of these monitoring systems, both of which have phone lines in common.

The total monitoring costs associated with a central monitoring system are significantly less than a direct connection system. A central monitoring system requires only two

phone lines or a digital dialer. A digital dialer is a device used to transmit a fire alarm signal from the alarm panel to the central monitoring station over a fiber optic cable. On the other hand, it can take a great deal of time for the fire alarm signals to reach NWCD with a central monitoring system. The time it takes for a fire alarm signal to reach a central station, which can be located anywhere in the United States, can extend up to five and even ten minutes. This delay in transmission time can translate into a significant delay in dispatching the Fire Department.

Another disadvantage to central monitoring stations is that fire alarm trouble signals, or the complete loss of fire alarm signals, are not always relayed to the Fire Department. Private companies that own the central monitoring stations also do not generally follow-up on these issues. Central monitoring stations are required by Underwriters Laboratories to provide a runner service, a service which sends a representative to the site to investigate the fire alarm trouble signal; however, this service normally is not implemented. Central monitoring stations that utilize digital dialers are also problematic. Digital dialers are only required to report to the central monitoring station once every twenty-four hours. Thus, if the fire alarm panel fails, the central monitoring station may not be notified for another twenty-four hours.

The distinct advantage of the direct connection system is that the dispatch center receives the fire alarm signal very quickly because it takes the "middle man" (monitoring company) out of the equation, which eliminates the delay in dispatching the Fire Department. Direct connection systems are simple as they require only the use of one dedicated phone line. However, the cost of a direct connection phone line can be significant, ranging from \$90 to \$200 per month. Another disadvantage of a direct connection system is that this type of phone line is prone to several problems. Grounding failures can cause false signals to be transmitted and it can take months for the phone company to repair these problems. The direct connection system is also a somewhat outdated technology. Phone companies are looking to replace and/or no longer maintain direct phone lines. A direct connection system functions using copper phone lines, which are becoming obsolete. A significant amount of Fire Prevention Bureau staff time is used meeting with building owners, trying to help them repair direct connection issues.

Both monitoring types offer distinct advantages and disadvantages. One important point to highlight is that our reliance on telephone lines to transmit fire alarm signal information is becoming increasingly expensive and unreliable.

Radio System Configuration

Radio monitoring of fire alarm systems has been available for well over ten years. However, the technology has become much more common place and affordable in the last five years. Radio monitoring technology essentially eliminates dedicated phone

lines that transmit a fire alarm signal at a specific location to a fire department's dispatch center. Radio systems consist of individual radios located in buildings that contain fire alarms, which send a signal back to a monitoring station. While there are multiple forms of radio systems, the most common is a network which is ultimately tied to a municipality's dispatch center.

The infrastructure of the radio system would consist of four main components: (1) the radio transmitter, (2) the repeaters, (3) the "head end equipment" receiver, and (4) NWCD's receiving equipment. The radio transmitters are installed in individual businesses located throughout a community. These transmitters send a radio signal to the head end receiving equipment. Repeaters are built into each individual radio, which allows the signal to transmit through each radio back to the head end equipment. This allows radios out of range of the head end equipment to send a signal through multiple paths back to the head end equipment. The head end equipment receives the signals from each individual radio and transmits them back to NWCD's receiving equipment. The head end equipment is usually located in a building within a community such as a fire station. NWCD's receiving equipment would then ultimately process the radio signal to the dispatcher.

Radio systems begin with individual radios being installed (by a radio installation contractor) in each building that contains a fire alarm system/panel. These radios then transmit and repeat fire alarm signals back to the centrally located receiver, which is commonly referred to as "head end equipment." The head end equipment then transmits the signal to the municipality's dispatch center. The individual radios run off of standard 110 volt power, but are also required to have battery back up power. The back up power allows the radio to operate for sixty hours without electricity. The radio system runs on its own frequency, thus reducing the possibility of interference. Because each individual radio acts as its own repeater it makes the system very reliable and powerful. Several neighboring communities such Buffalo Grove, Hoffman Estates, Lake Zurich, Palatine, Naperville, and Wheaton, to name a few, are currently using similar systems.

Implementation Plan and Cost

The first step in implementing this type of project would be an ordinance change to the Village's current Fire Prevention Code to allow radio monitoring. The ordinance change would require all new fire alarms be monitored via radio by NWCD. The ordinance change would also indicate that radio monitoring would only be allowed through NWCD and their corresponding monitoring contractor. Existing systems would be changed to radio monitoring upon the request of an alarm owner, when the existing fire alarm equipment is updated, or where a disconnection of the telephone lines has occurred for period of time greater than thirty days.

Due to the current franchise agreement between NWCD and ADT, the radios would need to be purchased and/or leased by individual building owners through ADT. The head end equipment would then need to be installed at Fire Station 13. ADT would install this equipment at no cost to the Village. Radios would initially be installed in all of the Village-owned buildings to establish a radio network. These radios would allow the Village to establish the necessary infrastructure and radio strength to make the system functional.

Under this configuration monitoring fees for business owners will be approximately \$90 per month. Approximately \$45 would be split between ADT and NWCD for monitoring, \$40 would go to ADT for radio leasing, and there would be a \$5 monthly radio maintenance fee. The Village would have to use ADT radio equipment because of their current franchise monitoring agreements with NWCD. This monthly rate, however, is significantly less than businesses and organizations currently pay in monthly phone line and monitoring fees.

Moving Forward

The most important part of the proposed radio system is that it will increase building safety and reduce the number of fire alarms out of service at any given time. The radio system will not rely on phone lines, which have become increasingly problematic, and will significantly shorten the amount of time it takes for the Fire Department to be notified of a problem. The Village could permit other service providers to establish a radio network in Mount Prospect. However, this configuration could result in unstable radio networks which would be unable to provide adequate accountability for systems out of service. Several businesses that do not have land line phones would also benefit from the new radio monitoring system. Businesses would not have to pay for the initial phone line set-up fees just to monitor their fire alarm system. Several businesses and building owners have already inquired about the use of radios to monitor their fire alarm systems. Radios are to businesses, owners and tenants one of the more cost effective approaches to monitoring fire alarm systems.

Recommendation

I recommend the Village establish a radio network to monitor the community's fire alarm systems via NWCD. This type of system has the potential to provide consistent and reliable fire alarm monitoring for the Village, while also reducing the cost to local businesses and organizations. Radio monitoring directly connected to NWCD would allow for a safe and reliable network with real time fire alarm notification. Switching to this type of system would eliminate a majority of the problems associated with current fire alarm system monitoring configurations and appears to be one of the most reliable monitoring systems available. The first step in the process would be to update the Fire

Prevention Code according to the revised ordinance (see attachment). These changes would allow for existing fire alarms to be radio monitored via NWCD at an owner's request, during fire alarm upgrades, or if the fire alarm system has been out of service because of a phone line issue for greater than thirty days. All existing fire alarm systems would not be required to be upgraded to radio monitoring and owners could remain with their existing fire alarm monitoring service. All future fire alarms installed after March 1, 2012, would be required to be monitored by NWCD via a radio transmitter.

Bryan Loomis

Attachment

BL/nn

ORDINANCE NO. _____

**AN ORDINANCE AMENDING CHAPTER 24
ENTITLED “FIRE PREVENTION CODE”
OF THE VILLAGE CODE OF MOUNT PROSPECT, ILLINOIS**

**BE IT ORDAINED BY THE PRESIDENT AND BOARD OF TRUSTEES OF THE
VILLAGE OF MOUNT PROSPECT, COOK COUNTY, ILLINOIS:**

SECTION 1: Subparagraph (A)(4) of Section 24.204 entitled “Fire Alarm Systems” of Chapter 24 entitled “Fire Prevention Code” of the Mount Prospect Village Code shall be amended by deleting subparagraph (A)(4) in its entirety and adding the following new language to be and read as follows:

4. A. New Systems. All new fire alarm systems shall transmit trouble and fire signals directly to the Mount Prospect Fire Department’s remote receiving station via a wireless transmitter in accordance with NFPA 72. All such equipment must be inspected and approved by the Mount Prospect Fire Department (effective March 1, 2012).
- B. Existing Systems. All existing fire alarm systems must transmit trouble and fire signals only to an approved central station or to the Mount Prospect Fire Department’s remote receiving station. Existing fire alarm systems shall convert to wireless transmission upon (a) the property owner’s request; or (b) when the existing fire alarm equipment is modified or replaced; or (c) where a disconnection/disruption of the telephone lines serving the system has occurred for a time period of greater than thirty days. Upon changing to wireless transmission, trouble and fire signals may be transmitted to the Mount Prospect Fire Department remote receiving station only.
- C. Combination Alarms and Automatic Dialers. Combination burglar and fire alarm systems and stand alone automatic dialers (including digital), shall be prohibited in all new or existing use group classifications except single-family attached and detached homes, townhomes and manufactured homes.
- D. Smoke Alarms. Single or multiple station smoke alarms shall be exempts from those regulations.

SECTION 2: This Ordinance shall be in full force and effect from and after its passage, approval and publication in pamphlet form in the manner provided by law, except that 4(A) "New Systems" shall become effective on March 1, 2012.

AYES:

NAYS:

ABSENT:

PASSED and APPROVED this _____ day of _____, 2011

Irvana K. Wilks
Mayor

ATTEST:

M. Lisa Angell
Village Clerk