

Ensuring Emergency Messages Get Delivered in a High Priority Research Facility

When the Metis Secure team met with Madelyn Miller, Director of Environmental Health and Safety (EH&S) at Carnegie Mellon University to demonstrate a new emergency warning platform, she described the difficulty of delivering emergency warnings and information on campus. Miller's concerns included the difficulty of quickly notifying the campus population to evacuate or to shelter in place during times of emergency. For example, due to the proximity of rail lines to campus, a derailment of hazardous materials in Panther Hollow would require immediate notification of the campus population. Less urgent events which also required notification, such as water disruptions, proved to be time consuming and piecemeal. Mock drills had identified the difficulty in both alerting and providing information to students and staff for short notice emergencies.



Mellon Institute is a high priority research facility where communications dead zones pose challenges to safety officials responsible for emergency notification.

"I was concerned, at that time, about our ability to drill down to the student level. For example, I wanted to be able to tell a teacher in a classroom not to let students out if some emergency situation outside warrants a shelter-in-place directive. In some cases we don't have much time to notify. Therefore, I am impressed by the message speed and targeting capabilities that the Metis Secure team is able to achieve. We also have areas where cell phone reception isn't good, in Mellon Institute, for example. I needed to fill some holes where existing technologies did not provide solutions. Metis Secure has a unique solution that we could use in any building on campus, but is particularly effective in addressing our most challenging environments."

***Madelyn Miller, Director, Environmental Health and Safety,
Carnegie Mellon University***

Limitations of Existing Notification Systems

Although the university employed a range of technologies currently available to alert and inform the campus population, many of these solutions had limitations.

Solution	Limitations
Cell calling	<ul style="list-style-type: none">• Takes 30+ minutes to receive messages• Voluntary opt in yields only about 40% enrollment in warning program• Poor reception limits success in some locations
Email	<ul style="list-style-type: none">• Only works when someone voluntarily reads email• Not a “wake up and warn” technology
Fire alarm	<ul style="list-style-type: none">• Loud buzzer, little or no information• Often thought to be a false alarm or drill and ignored by occupants• Cannot tell people to shelter in place
Blue light towers	<ul style="list-style-type: none">• Outdoor locations only• Not capable of mass notification

None of the existing solutions employed by the university provided the ability to deliver warning information to specific buildings or rooms in a time-effective manner. According to Miller, when a water main break occurred several months earlier, security resorted to posting handwritten notices on doors in affected locations to communicate updates and information.

In exploring various communications solutions, CMU identified one building, Mellon Institute, as the single most difficult environment for communications.

High Priority Research Facility with Challenging Infrastructure

Mellon Institute's location in the heart of the Oakland neighborhood connects it to the expansive network of scientific activity in Pittsburgh's biomedical, technological and industrial research community. On a daily basis approximately 500 researchers at Mellon Institute use a wide range of potentially dangerous chemicals in over 170 laboratories and conduct irreplaceable research that cannot easily be interrupted.

Not only does the scope of research activity present a continual safety concern, but the unique construction of the building itself poses a second critical issue in terms of emergency warning. Covering a city block, the building is densely constructed of stone and concrete. Sixty two monolithic limestone columns line the four sides of the building. Concrete between floors ranges from 18 to 30 inches thick. This kind of old world construction is

a hostile environment with extensive dead zones for cell phone reception on four underground floors, creating problems for cell phone based calling and text messaging systems.

The Metis Secure Solution

To solve this communications dilemma, Miller decided to install the Metis Secure system in Mellon Institute to address key concerns such as message speed, targeting locations, providing instruction, penetrating reception dead zones, and independence from phone, Internet and power failure.

Meeting the complex communications challenges faced at Carnegie Mellon University required a platform independent from mobile phone and WiFi networks, which have limited ability to penetrate into buildings and slow down considerably during times of crisis.



MS-5100 notification device at Mellon Institute

Using a unique layered combination of wireless mesh networks and FM-RBDS broadcast, the Metis Secure system, with 119 notification devices mounted to walls on all 10 floors of Mellon Institute, was capable of sending specific warning messages to specific building locations in Mellon Institute in less than 10 seconds. The FM-RBDS broadcast provided an all-at-once broadcast while the mesh network allows the system to penetrate reception dead zones by passing warning messages from device to device within the building.

The Metis Secure solution:

- Delivers data to all of the Metis notification devices in typically less than one second!
- Penetrates dead zones by using a local wireless mesh network
- Enables targeted messages sent to rooms, floors or other specific locations
- Supports custom messages relevant to Mellon Institute
- Uses voice, text, lights and siren – ensures ADA compliance and maximizes effectiveness of message
- Has a map-based interface incorporating floor plans of the building identifying high risk areas
- Provides a Request Help capability from any notification device
- Has battery back-up in each unit to overcome power failures
- Monitor the system on-site or off-site to identify points of failure, maintenance needs and system performance

Beyond Alerting – Request for Help

Each MS-5100 notification device has a Request Help feature. The HELP button allows a user to leave a recorded voice message for campus police - for example...*“My colleague is having trouble breathing. I need help.”* The campus dispatcher can instantly see the exact location of the Request for Help and can listen and quickly respond to the brief recording. In this manner, information about a building fire, a medical emergency, or other events can be fed directly to campus police by faculty, staff, students and visitors faster than they can make a phone call. This feature is particularly important because it enables security to notify affected people of events that may require the evacuation of a floor or the entire building to ensure safety.

Emergency Notification from Anywhere

Metis Command Center software was installed on the university’s server and is monitored by multiple authorized users both on-site and remotely. On-site guards can monitor and respond to requests for help; campus police dispatchers can also supervise and operate the system from police headquarters off site; Madelyn Miller and authorized environmental health and safety staff can access and operate the system from various remote locations.

Conclusion

The Metis Secure solution successfully addressed the key concerns such as message speed, targeting locations and penetrating reception dead zones, even in the challenging communications environment of Mellon Institute. As part of implementation there was a live evacuation drill, during which the building manager used the Command Center software to send a message to all of the notification devices in Mellon Institute. There was great internal response to the drill, many people surveyed commented that they preferred the voice message to the fire alarm due to clarity of message and the directions provided by the Metis Secure system. The deployment of the Metis Secure notification platform at Mellon Institute resulted in Metis Secure and CMU being recognized as **2009 Technology Innovators of the Year** by *Campus Technology Magazine*.



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