

UNANSWERED QUESTIONS ABOUT FIRE RADIOS AND COMMUNICATIONS AT THE WORLD TRADE CENTER TERRORIST ATTACK ON 9/11

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There are still two unanswered questions about fire radio communications at the World Trade Center terrorist attack:

1. How important a role did radio communications play on 9/11?
2. What should be the telecommunications industry's priorities in working to aid the fire service in future catastrophes?

The answer to the first question is radio communications played a major life-and-death role at the World Trade Center terrorist attack.

A brief history of radios in the FDNY: In the 1960s, firefighters for the first time were issued handie-talkies, or so-called portable radios. Firefighters no longer relied on hand signals, shouting and runners to communicate at fires. These "analog" radios operated on a VHF channel.

In 2001, the FDNY purchased new "digital" portable radios for fire-fighters. These digital radios operated on UHF channel. Soon after issue, there appeared to be a delay in signal transmission and a voice-quality problem with these new digital radios. They were temporarily withdrawn from service until these problems could be solved. The new UHF digital radios have been reprogrammed in the analog mode in an attempt to remove the communication delay and to improve the voice quality. Chief officers have been issued command radios.

There were eight major life-and-death "communication events" at the World Trade Center on 9/11:

Communication event 1- After the first plane struck the World Trade Center's north tower, a fire safety director instructed occupants of the south tower to return to their offices and not exit the building onto the plaza.

Communication event 2 - The fire department and the police department did not use the unified incident management system to communicate with each other.

Communication event 3 - Some occupants of the towers fleeing the fire went up the stairs. They attempted to go up to the roof and wait for helicopter rescues.

Communication event 4 - The fire chief in the north tower could not communicate to firefighters on the upper floors.

Communication event 5 - The fire chief in the south tower was able to communicate to the firefighters on some of the upper floors.

Communication event 6 - The fire officers at the command post could not transmit radio messages to communications headquarters, announcing the collapse of the south tower. Only a responding fireboat commander seeing what had happened from the water was able to report that the south tower had collapsed.

Communication event 7 - Some firefighters in the north tower did not know the south tower had collapsed. They continued to search for victims.

Communication event 8 - The police helicopter pilot could not communicate to the fire chief a warning that the south tower was about to collapse.

Communication events

1. The fire safety director who told the occupants to return to their offices made a correct decision based on the information he had at the time. Now we know his instructions cost lives. However, after the plane hit the north tower, the people in the south tower were safer if they stayed in the building. If the occupants had been allowed to leave and go out onto the plaza they would have been struck by falling people, plane parts, glass and sections of the building facade.

As a fire chief I would have given the same instructions. I would not have ordered the evacuation of the south tower. No one could predict that a second plane would crash into the south tower. In hindsight, the communication announcement to go back into the building cost lives.

2. The fire service of America and the New York City Fire Department use a so-called unified incident management system. The FDNY has used this unified incident management system for 10 years. Unfortunately, no other agency in New York City government uses it with

the fire department. The unified incident management system is designed to organize and manage emergency operations. It also improves interagency communications, coordination and cooperation at fires. The system is designed for use at small and large-scale fires and emergencies. The unified incident management system is modeled after a typical business organization. At a fire or emergency we have a CEO, an operations officer, a planning officer, a logistics officer and a finance officer. The staff of the incident commander includes a safety officer, a public information officer and a liaison officer. The liaison officer interacts with other operating agencies such as the police, fire or EMS. The New York City Fire Department has several fire officers who go around the nation teaching other fire departments how to use this unified incident management system. The New York City Fire Department has the knowledge, the classroom facilities and the instructors who could teach this system to every agency in New York City.

Several years ago, Governor George Pataki signed an executive order requiring every emergency agency in New York State to use the unified incident management system. Unfortunately, the police commissioner and the fire commissioner have stated publicly at a city council hearing they would rather not use the unified incident management system.

3. Some people at the World Trade Center went upstairs to the roof to await rescue by helicopters, instead of going downstairs to the street. How did this miscommunication get into the minds of New Yorkers, living and working in high-rise buildings? How did the fire service fail to communicate this life-saving message to people living and working in high-rise buildings? You should never go upstairs during a fire. To escape a fire you should exit downstairs, not up. People living and working in high-rise buildings should know that going upstairs to the roof is not always possible. For example, not every stair in a high-rise building extends up to the roof. Some stairs dead end at intermediate floors below the roof. Other stairs in high-rises lead up into mechanical machinery rooms and not to the roof. Also, people should know that helicopters cannot land on the roofs of most New York City high-rise buildings. There are no heliports. Many high rise building in New York City taper up to a spire at the top. Hundreds of people can go down a stairway in the same time it takes for one or two people to be rescued by a helicopter. The fire service should tell the people working and living in high-rise buildings to never go to the

roof during a fire. Go down the stairs. Get below the fire. Flame and heat rises upward. Safety is below. Perhaps there should be another warning sign in high-rise buildings, next to the sign that says, "Do not use this elevator in case of fire." We may need another sign to say, **"Do not go to the roof in case of fire."** This mistake had already killed several people in the 1998 high-rise residential building fire that occurred in the Macaulay Culkin apartment in New York City. People died in the smoke-filled stair attempting to get to the roof. The misconception of going up to the roof and waiting for helicopter rescue comes from watching helicopter rescues at famous high-rise fires around the world, shown over and over again on programs like those on television. The visual image of the daring rescue is more powerful than the spoken word, These dramatic scenes of people dangling from cables during high-rise fires have given us the false idea that this is how we should leave a building during a high-rise fire. You never see, in a TV program, the hundreds of people saved by descending a stairway. The fire service must do a better job of communicating to the public how to escape a high-rise fire. Go down the stairs.

4. The fire chief was not able to communicate to some firefighters working on the upper floors of the north tower. The fire chief in command of the north tower, Joseph Callan, ordered all firefighters to leave the building at 9:28 A.M. His message was not heard by firefighters on the upper floors. His order to withdraw from the building was given 32 minutes after he arrived and 34 minutes before the first tower, the south tower, collapsed. The north tower collapsed at 10:28, one hour after Chief Callan called for all fire-fighters to leave. Unfortunately, the radios in the north tower did not transmit his message.

I spoke to Chief Callan and I asked him exactly what did he say over the inoperable radio. He said that at 9:28 he ordered, "Everyone come down out of the building. Leave the building immediately." I asked him what made him decide to order firefighters out of building. He stated the following reasons:

A. The number of falling bodies crashing to the ground was increasing dramatically. B. No elevators were working in that tower. C. Communications were growing weaker and weaker. They went from being bad to worse. Some firefighters heard his message; most did not.

D. People coming out of the stair to the lobby were few and far between. It went from a double file of office workers coming out the stair into the lobby, to a single person 20 feet apart. He also knew he now had more firefighters than office workers in the upper floors of the north tower. E. And most importantly, when responding in to the fire before entering the lobby, he had a good look at the plane crash damage and the extent of the fire on the upper floors. He knew the building could collapse. F. Also, he knew it takes time for firefighters to walk down 40 or 50 stories. The portable radios in the north tower did not work, even though there was an antenna installed to enhance fire radio transmissions. Radios do not work in high-rise buildings because of the massive amount of steel and concrete in the structures. There are approximately 850,000 buildings in New York City. They are mostly what we call low-rise buildings.

I believe up to 5,000 of the 850,000 are high-rise buildings. The fire radios transmit messages OK in 845,000 buildings, the low-rise buildings. Radios cannot transmit messages in the 5,000 high-rise buildings. Even today, in high-rise buildings and below-ground areas, tunnels and subways firefighters have to improvise communications. Fire officers must use a booster command radio, a high-rise repeater radio, a radio relay system positioning firefighters on intermediate floors or a wire system unraveled down a stairway.

5. On 9/11, the chief in the south tower was able to communicate to fire officers up to the 78th floor through a relay system. The south tower had an antenna installed in the building to enhance fire department radios, and it worked intermittently. The command chief who directed operations in the south tower where the radios worked was a commander at the 1993 World Trade Center bombing. No one knows why the communications in the south tower were effective up to the 78th floor, but failed in the north tower. Also, no one knows if the communications in the south tower would have transmitted effectively up further, beyond the 78th floor, up to the 110th floor? The fire service should know the answers to these questions.

6. There were no communications from the fire command post after the south tower collapsed. The command post and the communications vehicle were destroyed by the first collapse. Only a fireboat commander responding in the harbor was able to see what happened. The fireboat officer told the Manhattan dispatcher over the primary radio frequency that the

World Trade Center building collapsed. The fireboats operate on a different frequency than the Manhattan frequency. This citywide radio frequency is a backup for use when one of the borough radio frequencies is out of service. There are six mobile (apparatus) radio frequencies used for New York City fire communications. There is the Manhattan frequency, the Bronx and Staten Island combined frequency, Brooklyn frequency, a Queens's frequency, a citywide frequency and the firefighters' portable radio frequency. The citywide radio frequency provides an important backup - emergency - system during a major disaster, any-where in the five boroughs.

7. Some fire officers operating in the north tower did not know the south tower had collapsed. They did not know the other building collapsed because they were out of sight and sound of the collapse, inside stairways searching for remaining office workers. The stairway enclosure walls were insulated inside the walls of the building's core envelope. The firefighters, who in the north tower, out of sight and sound of the falling south tower, were conducting a secondary search. Even outside, until the dust and smoke cleared from lower Manhattan, some survivors did not know exactly what happened. Everyone was blinded by dust and smoke for at least 10 minutes. Some thought a bomb had exploded or that another plane had crashed into the streets.

8. The police helicopter pilot was not able to communicate with fire commanders. The pilot could see that the south tower was leaning and looked like it was about to collapse. He tried to reach the fire commander using the police radio. The fire radios and the police radios are on a different frequency and there was no communication between the two agencies. Fire radios must have the ability to send and receive messages to the police officers on the ground and in aircraft.

Telecommunication's Industry's Priorities

The second question about the radios is what should be the priorities of the telecommunications industry? They should be able to install antennas in the 5,000 high-rise buildings in New York to enhance the firefighters' radios. A chief officer friend of mine said, "I want to talk to firefighters! I want to talk to firefighters in addition to the chiefs, working on the upper floors of burning high-rise. And I want the firefighters to be able to talk to me. Also, I

don't want to be limited to a person-to-person radio communication with chiefs. I need a conference call. I have to talk to chiefs and firefighters."

The fire chief continued, "I would like to see someone in the telecommunications industry go to the Empire State Building and call the local fire company to the lobby, and try a firefighter's radio. See if a firefighter's radio transmits a clear message from the lobby to the top floors of the Empire State Building. Then see if a firefighter's radio can transmit a message from the lobby to the lowest cellar. **If you can make a firefighter's radio work in the Empire State Building, you can make a firefighters radio work in any high-rise."**