

attacks, different first responder agencies within each city must be fully coordinated, just as different branches of the U.S. military are. Coordination entails a unified command that comprehensively deploys all dispatched police, fire, and other first responder resources.

In May 2004, New York City adopted an emergency response plan that expressly contemplates two or more agencies jointly being lead agency when responding to a terrorist attack but does not mandate a comprehensive and unified incident command that can deploy and monitor all first responder resources from one overall command post. In our judgment, this falls short of an optimal response plan, which requires clear command and control, common training, and the trust that such training creates. The experience of the military suggests that integrated into such a coordinated response should be a unified field intelligence unit, which should receive and combine information from all first responders—including 911 operators. Such a field intelligence unit could be valuable in large and complex incidents.

Radio Communication Challenges: The Effectiveness and Urgency of Evacuation Instructions. As discussed above, the location of the NYPD ESU command post was crucial in making possible an urgent evacuation order explaining the South Tower's full collapse. Firefighters most certainly would have benefited from that information.

A separate matter is the varied success at conveying evacuation instructions to personnel in the North Tower after the South Tower's collapse. The success of NYPD ESU instruction is attributable to a combination of (1) the strength of the radios, (2) the relatively small numbers of individuals using them, and (3) use of the correct channel by all.

The same three factors worked against successful communication among FDNY personnel. First, the radios' effectiveness was drastically reduced in the high-rise environment. Second, tactical channel 1 was simply overwhelmed by the number of units attempting to communicate on it at 10:00. Third, some firefighters were on the wrong channel or simply lacked radios altogether.

It is impossible to know what difference it made that units in the North Tower were not using the repeater channel after 10:00. While the repeater channel was at least partially operational before the South Tower collapsed, we do not know whether it continued to be operational after 9:59.

Even without the repeater channel, *at least* 24 of the *at most* 32 companies who were dispatched to and actually in the North Tower received the evacuation instruction—either via radio or directly from other first responders. Nevertheless, many of these firefighters died, either because they delayed their evacuation to assist civilians, attempted to regroup their units, lacked urgency, or some combination of these factors. In addition, many other firefighters not dispatched to the North Tower also died in its collapse. Some had their radios on the wrong channel. Others were off-duty and lacked radios. In view of these