

## LOOKING BACK: A PERSPECTIVE ON HIGH RISE BUILDING FIRE SAFETY PART 2

By Richard Schulte

### Recap (of Part 1)

On March 6, 2002, the Congressional Science Committee held a hearing on the collapse of the World Trade Center towers. One of the witnesses at this hearing was the director of the National Institute of Standards and Technology (NIST), Dr. Arden Bement. Dr. Bement's testimony included the following statements:

*"The implementation of the results of such an investigation would be critical to restore public confidence in the safety of tall buildings nationwide, enhance the safety of fire and emergency responders, and better protect people and property in the future. . ."*

*"Fourth, to study procedures and practices used to provide adequate structural reserve capacity to resist abnormal loads (e.g. blast, explosion, impact due to aircraft or flying debris from tornadoes, accidental fires, and faulty design and construction), especially those that can be anticipated prior to construction (e.g. impact of a Boeing 707). . ."*

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*“In conclusion, I believe it is imperative for the U.S. to learn from the worst-ever building disasters in human history and take aggressive remedial action to minimize future losses.”*

Just from the excerpts of Dr. Bement’s testimony above, it is clear that NIST implied that the investigation into the collapse of the World Trade Center (WTC) towers would address the issue of how to protect buildings from terrorist attacks. Given this, it was quite surprising to find that the final report on the NIST WTC towers collapse investigation (published in the fall of 2005) failed to include a discussion of how to protect buildings from terrorist attacks. Instead, NIST recommended that buildings be designed to withstand “multi-hazards”, without defining the precise meaning of that term.

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## Part 2

Although the fire record of high rise buildings protected by a sprinkler system in the United States is exemplary, NIST concluded that buildings constructed per the high rise building provisions contained in the model building codes used in the United States were not “safe” enough. Hence, NIST recommended that improvements in the level of safety provided for high rise buildings be made. In other words, NIST dismissed the superb safety record of high rise buildings protected by a sprinkler system as not being relevant. NIST’s rationale for dismissing the statistics was that we have only been providing sprinkler protection in high rise buildings for a little over 3 decades (1973 to 2005). NIST argued that for the historical safety record of high rise buildings to be statistically meaningful, far more data than just 32 years worth of history, now 37 years, was required.

Interestingly enough, it was the Federal Government (the General Services Administration/Harold Nelson) who argued back in the early 1970’s that high rise buildings should be protected throughout by a sprinkler system and that numerous reductions in passive fire protection should be considered in order to encourage the installation of sprinkler protection in high rise buildings. With the NIST WTC investigation reports, we now have the same Federal Government arguing that sprinkler protection is not reliable enough and that many of the reductions in passive fire protection permitted when sprinkler protection is provided should not be allowed. The NIST report specifically states that the structural fire protection for high rise buildings should be designed based upon the assumption that the sprinkler system will fail.

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An article titled "*From the oil spill to the financial crisis, why we don't plan for the worst*" written by Judge Richard A. Posner, a member of the 7<sup>th</sup> circuit of the U.S. Court of Appeals, appeared in the Opinion section of the June 6, 2010 issue of the Washington Post newspaper. In the article, the Judge posed the following question:

*"Why are we so ill prepared for these disasters?"*

Judge Posner pointed to such disasters as tsunami which occurred in the Indian Ocean in 2004, Hurricane Katrina (2005) and now the BP oil spill in the Gulf of Mexico as disasters for which we seemed not to be prepared. The collapse of WTC towers and WTC Building 7 could also be included in this list of disasters.

Other excerpts from Judge Posner's article included the following:

*"Of course, if the consequences of the disaster would be very grave, the fact that the risk is low is hardly a good reason to ignore it."*

*"Our tendency to procrastinate is aggravated by three additional circumstances: when fixing things after the fact seems like a feasible alternative to preventing disaster in the first place; when the people responsible have a short time horizon; and when the risk is uncertain in the sense that no objective probability can be attached to it."*

*"Officials bear the political costs of preventive measures but do not receive the rewards."*

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In this short article, Judge Posner manages to touch on both NIST's argument for making high rise buildings “safer” and the argument against implementing the NIST recommendations. NIST makes the argument that the cost of a building collapse, both in terms of lives and economic costs, is so great that we need to address the issue even though the probability of such a collapse is minimal. Opponents of NIST's recommendations make the argument that the probability of a building collapse is practically nil, based upon the historical record, and, given that, the enormous costs to address such an occurrence is simply not worth the benefits. In other words, based upon an analysis of the risk of a collapse, we should simply accept the risk.

Rather than make an argument against the NIST recommendations based upon cost/benefit or a risk-based analysis, a far stronger argument against implementing the NIST recommendations is an argument based upon safety priorities. Even NIST concedes that a building collapse is an infrequent event with a probability of occurrence ranging anywhere from one building collapse every 100 years to one building collapse every 500 years and, perhaps, even less. Given that probability of the frequency of occurrence, should we invest capital to prevent a building collapse or

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should we invest capital in preventing a far greater disaster which occurs with a probability of 100 percent on an annual basis? The answer to that question seems rather obvious.

Each year, roughly 40,000 Americans die as a result of accidents on our roads and highways. The premature deaths of 40,000 Americans annually far exceeds the disaster that the NIST recommendations are intended to address and the probability of the occurrence of this disaster is one hundred percent on an annual basis. Based upon this perspective, it would seem that the diversion of capital from reducing highway fatalities to preventing building collapses is rather nonsensical. From the standpoint of priorities, it would seem that any new capital devoted to safety should be utilized to address safety issues where we will get “the biggest bang for our buck”.

To put it quite simply, the implementation of the NIST recommendations is a mis-allocation of funding devoted to the “safety” of the American public. How many Americans will die prematurely as a result of the implementation of NIST’s recommendations which take funding which could have been directed to highway safety and instead put it into building collapse prevention? When you look at the NIST recommendations from that viewpoint, the implementation of the NIST recommendations takes on a whole different complexion.

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If we, as a nation, have made the decision to spend more capital on public safety, let’s spend that money wisely. The implementation of the NIST recommendations is simply not a wise use of capital invested in public safety.

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