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## LOOKING BACK: TEN YEARS LATER

By Richard Schulte

After World War II ended, Europe lay in ruins, while America's industrial base went unscathed by the war. With victory, America was the pre-dominant manufacturing nation and the confidence of the American people soared. Symbols of that confidence in the 1960's included America's commitment to sending men to the moon within the decade and the design and construction of tall buildings in cities across the United States. Some of the tall buildings designed in the 1960's included:

Building	Location	Height	Construction Completed
General Motors Building	New York	705 feet	1968
Bank of America Center <sup>1</sup>	San Francisco	779 feet	1969
First National Plaza <sup>2</sup>	Chicago	850 feet	1969
John Hancock Center	Chicago	1,127 feet	1970
U.S. Steel Tower	Pittsburgh	841 feet	1970
World Trade Center Towers	New York	1368/1362 feet	1970/1971
1251 Avenue of the Americas <sup>3</sup>	New York	750 feet	1971
One Shell Plaza	Houston	714 feet	1971
One Penn Plaza	New York	750 feet	1972
Standard Oil Building <sup>4</sup>	Chicago	1,136 feet	1973
TransAmerica Building	San Francisco	850 feet	1972
One Astor Plaza	New York	745 feet	1972
IDS Center	Minneapolis	792 feet	1973
Peachtree Plaza Hotel	Atlanta	723 feet	1973
Sears Tower <sup>5</sup>	Chicago	1,451 feet	1974
U. S. Steel Building <sup>6</sup>	New York	743 feet	1974
First Interstate Tower <sup>7</sup>	Los Angeles	858 feet	1974
Centerpoint Energy Plaza	Houston	741 feet	1974
Renaissance Tower	Dallas	720 feet	1974
Security Pacific Plaza <sup>8</sup>	Los Angeles	735 feet	1974
Water Tower Place	Chicago	859 feet	1976

Most notable among these tall buildings were the Sears Tower, the World Trade Center Towers, the Standard Oil Building and the John Hancock Center due to the fact that these buildings soared to well over 1,000 feet in height. With the exception of the Sears Tower, the principal fire protection systems provided for these buildings were limited to fire resistive construction, a fire alarm system and a standpipe system. The fire protection provided for the Sears Tower differed markedly from these other four tall buildings-in addition to the fire protection features provided for the other buildings, the Sears Tower was also protected by a sprinkler system.

Through the years, the fire performance of tall buildings constructed in the United States has been relatively good. Since the early 1970's, major fires have indeed occurred in high rise buildings in the United States, but they have actually been very few in number. The fires at the MGM Grand Hotel in Las Vegas (November 21, 1980), the Hilton Hotel in Las Vegas (February 11, 1981), the First Interstate Bank Building (May 4, 1988) and the One Meridian Plaza Bank Building (February 23-24, 1991) immediately come to mind, but it should be noted that, with the exception of the MGM Grand Hotel fire, the number of fatalities which occurred in each of these fires was minimal. In the fire at the MGM Grand Hotel, 85 building occupants perished principally due to the spread of smoke to the upper floors of the building.

Despite the relatively good fire record of the high rise buildings, building codes throughout the United States were modified in the mid-1970's through the early 1980's to require that all new high rise buildings be protected throughout by a sprinkler system. The rationale for the requirement for sprinkler protection for high rise buildings centered on the fact that floors in high rise buildings were beyond the reach of exterior fire fighting and the excessive number of fire fighters required to fight large fires in these buildings, as well as the risk of a large number of fatalities occurring in a fire in these buildings.

Subsequent to the adoption of the provisions for sprinkler protection in new high rise buildings, a number of jurisdictions throughout the United States also required the retroactive installation of sprinkler protection in existing high rise buildings.

Since the installation of sprinkler protection in the Sears Tower (and also the TransAmerica Building in San Francisco in the early 1970's), a major fire has yet to occur in a high rise building protected throughout by a sprinkler system in the United States, except on September 11<sup>th</sup>, 2001. (In the last few years, there have been a number of large fires in the exterior walls of high rise buildings protected by a sprinkler system.) In other words, the fire performance of sprinklered high rise buildings in the United States has been excellent for the last 35+ years, with the exception of one day.

The details of the events of September 11<sup>th</sup> are well known and are perhaps best forgotten. Suffice it to say that commercial aircraft were intentionally flown into both the 1 WTC and 2 WTC towers at a high rate of speed. While most buildings would have immediately collapsed upon impact, the 1 WTC tower remained standing for 102 minutes, while the 2 WTC tower survived for 56 minutes before collapsing. The fact that both towers remained standing for so long saved thousands of lives that September morning and, given this, the structural performance of both towers should be considered to have been magnificent.

Many will recall the aftermath of the September 11<sup>th</sup> attacks—the turmoil in the financial markets and the recession which followed. Many will also recall the reorganization of the Federal government to create the Department of Homeland Security (DHS) and the adoption of the Patriot Act. However, many are likely unfamiliar with the hearings which the Congressional Science Committee held on the collapse of the World Trade Center towers in March 2002. At these hearings, the director of the National Institute of Standards and Technology (NIST) requested authorization and funding to perform a detailed study of the World Trade Center towers collapse and to develop the means and methods to protect both new and existing buildings from similar attacks by terrorists.

In May 2002, the Congressional Science Committee recommended authorization for a study of the WTC towers collapse and the funding for the study was authorized by Congress. Nearly four years after September 11<sup>th</sup>, NIST completed its study of the WTC towers collapse and released a 10,000 page report on the events in Lower Manhattan. NIST's report included recommendations for improving the safety of new high rise buildings, but the issue of how to limit the consequences of similar terrorist attacks on new tall buildings was not included in the report. Nor were recommendations of how to improve the safety of existing tall buildings included in NIST's report.

Based upon NIST's recommendations, both the International Code Council, the publisher of the International Building Code, and the National Fire Protection Association, the publisher of the Building Construction and Safety Code (NFPA 5000), adopted new code provisions which implemented many of NIST's recommendations for making new high rise buildings safer. While new provisions for "safer" high rise buildings are included in the most recent editions of these two codes, few tall buildings have incorporated these new provisions in their design due to the recession. (The recession has essentially halted building construction throughout much of the nation.)

Since September 11<sup>th</sup>, as prior to that date, large fires in high rise buildings have been rare events in the United States. The only significant fire in a high rise building which resulted in major life loss after September 11<sup>th</sup> was the fire at the Cook County Administration Building located in the heart of downtown Chicago on October 17, 2003. There were six fatalities in that fire and all of these fatalities occurred within an exit stair enclosure. These fatalities could have easily been avoided had the Chicago Fire Department paid more attention to protecting the occupants of the building, rather than to extinguishing the fire.

Given the high rise building fire record in the United States since September 11<sup>th</sup>, it can be concluded that the implementation of the NIST recommendations for making high rise buildings "safer" has had no impact. In other words, the inclusion of provisions based upon the NIST recommendations in our model building codes has not reduced our fire losses in high rise buildings. This is not totally unexpected since many in the building construction field were of the opinion that the level of safety in high rise buildings protected by a sprinkler system was more than satisfactory and that the implementation of the NIST recommendations was unnecessary.

While the need for more restrictive safety provisions for tall buildings as a result of the events of September 11<sup>th</sup> would indeed seem to be questionable based upon the fire record since, there is no doubt that there are other safety issues in the United States which needed to be addressed in the last decade. One such issue is highway safety.

According to the National Highway Traffic Safety Administration (NHTSA) between 32,788 and 43,510 Americans died annually in highway accidents in the ten years since September 11th. This means that it is likely that more American died in highway accidents in the month of September 2001 than died as a result of the terrorist attacks on September 11<sup>th</sup>. Unfortunately, the death toll from highway accidents continued unabated at about the same rate month after month, every month since September 11<sup>th</sup>. In all, roughly 400,000 Americans have died in highway accidents since September 11<sup>th</sup>.

Given the statistics on highway fatalities, it seems reasonable to question whether the time, effort and capital expended to develop and implement the NIST recommendations for making high rise buildings “safer” could have been more wisely invested in highway safety.

While we remember the events of September 11<sup>th</sup>, 2001 on the tenth anniversary of that day, we should also remember the 400,000 Americans who are no longer with us because we chose to make addressing high rise building safety a higher priority than the issue of highway safety in the last decade.

- <sup>1</sup> The Bank of America Center in San Francisco is now know as the 555 California Street Building.
- <sup>2</sup> The First National Plaza Building in Chicago is now know as the Chase Tower.
- <sup>3</sup> 1251 Avenue of the Americas Building is also know as the Exxon Building.
- <sup>4</sup> The Standard Oil Building is now known as Aon Center.
- <sup>5</sup> The Sears Tower is now known as the Willis Tower.
- <sup>5</sup> The U.S. Steel Building is now known as One Liberty Plaza.
- <sup>7</sup> The First Interstate Tower is now known as the Aon Center.
- <sup>8</sup> Security Pacific Plaza is now known as Bank of America Plaza

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**U.S. HIGHWAY FATALITY STATISTICS  
2001-2010**

<b>YEAR</b>	<b>NUMBER OF FATALITIES</b>
2001	42,196
2002	43,005
2003	42,884
2004	42,836
2005	43,510
2006	42,708
2007	41,259
2008	37,423
2009	33,808
2010	32,788
<b>TOTAL</b>	<b>402,417</b>

**Source:** National Highway Traffic Safety Administration (NHTSA)