SCHULTE & ASSOCIATES
Building Code Consultants
880D Forest Avenue
Evanston, IL 60202
fpeschulte@aol.com
847/866-7479

THE BIRTH OF MODERN BUILDING FIRE PROTECTION: HIGH RISE BUILDING FIRE SAFETY (1971)

By Richard Schulte

A revolution in thinking regarding building fire safety occurred in the late 1960's and 1970's. Up until that time, it was generally accepted that sprinkler systems only provided property protection and that occupant fire safety could only be provided by a combination of egress facilities and building compartmentation. While the use of sprinklers to protect building occupants is an accepted concept today, back then, it was revolutionary.

In the middle and late 1960's and early 1970's, quite a number of tall buildings were constructed in the United States, including the World Trade Center towers (New York), the Sears Tower (Chicago), the John Hancock Building (Chicago) and the Standard Oil Building (Chicago). Of these buildings, only the Sears Tower was provided with sprinkler protection throughout when the building was initially constructed.

Given that the number of tall buildings being designed and constructed in the United States in the late 1960's, the protection of these buildings was of great interest in the fire protection field. In April 1971, the General Services Administration (GSA) sponsored a conference on high rise building fire safety at Airlie House in Warrenton, Virginia to discuss the fire safety design for a new high rise Federal office building in Seattle. A follow-up to the April conference was held on October 5, 1971.

The following are excerpts from the transcript of the proceedings of the **Reconvened International Conference on Firesafety in High Rise Buildings** held in early October 1971:

> "*The General Services Administration, the civilian construction arm of the Federal Government, has a vital interest in the development of improved methods and technology concerned with firesafety in buildings.*" Robert L. Kunzig, Administrator, General Services Administration, January 12, 1972

The following are comments made by Arthur F. Sampson, Commissioner of the Public Building Service (PBS):

> "*The first total firesafety system designed specifically for a Federal high-rise building will be installed in the 36 story Seattle Federal Building which is now under construction*."

"*The Seattle Federal Building substructure in now under construction. The superstructure, including the new firesafety system, is expected to go under construction next April with completion estimated for early 1974. . . It will be a 36 story building almost 500 feet tall, housing over 3,000 Federal employees from 19 Federal agencies.*"

"*Given all of the fire provision elements*[,] *it is expected that during the next 50 years there will be about 100 fires in the building. It is further predicted that <u>one</u> will extend beyond the work station with a 1% probability of that one fire involving an area larger than one room.*"

"*The integrity of the structural system* [structural fire protection] *is being provided at a level three to four times the potential of the most severe situation likely to occur.*"

"*Given all of the fire provision elements*[,] *it is expected that during the next 50 years there will be about 100 fires in the building. It is further predicted that <u>one</u> will extend beyond the work station with a 1% probability of that one fire involving an area larger than one room.*"

"*Ladies and Gentlemen, this demonstration has been designed to emphasize that GSA is serious about its commitment to implement the total firesafety system concept of the Airlie House Conference. . .*"

The following are comments made by Irwin Benjamin, Fire Research Section, National Bureau of Standards (NBS):

"*A fault tree is an event logic diagram. It is a tool which has been used for many years in accident analysis and shows the interrelationships of events that will affect the occurrence of an accident. . .*"

"*In summary, I would like to say there is nothing magical about the fault tree system, in fact, it doesn't even solve any problems for you. What it does do is help you to:*

- *organize your thoughts*
- *and show what is important.*"

"*I suggest that the fault tree can be used here today as an overall guide to the systems that are necessary to prevent tragedy in the high rise buildings.*"

"*The Seattle Federal Building will be protected throughout its entire structure by a specially designed automatic sprinkler system developed for the purpose of providing in excess of 99% probability of full control of fires in normal office and office support type arrangements. . .*"

Commentary

Model building codes have been developed and published by various organizations in the United States for over 100 years. A century of code development is quite a lengthy history.

In order to develop new provisions for inclusions in our model codes, it is helpful to understand the origins of code provisions. The origins of the high rise provisions contained in our model codes can be traced to the Airlie House conference held in April 1971 and the conference held on October 5, 1971.

This month marks the 40th anniversary of the Airlie House conference-the birth of modern building fire protection.

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