

Fire Investigation Summary

Rockefeller Center

High Rise Fire Rockefeller Center New York City October 10, 1996

On October 10, 1996, an electrical fire in the landmark Rockefeller Center in New York City required a five alarm response by FDNY to control the fire. The damage caused by five separate fires in various electrical rooms caused significant interruption to a major television network.



National Fire Protection Association
Fire Investigations Department

At approximately 4 a.m. on Thursday, October 10, 1996, an electrical fire occurred at 30 Rockefeller Plaza in New York City. Several fires broke out in five remote locations, filling many areas of the building with smoke. The entire building was evacuated, live broadcasts from a major television network were interrupted, and traffic movement was impacted for several blocks around the building. Fortunately, since the fire had occurred early in the morning, there were relatively few people in the building. Everyone was able to evacuate successfully.

The New York City Fire Department received a telephone report of the fire and dispatched a full first alarm assignment. As the fire fighters arrived, they could see smoke coming from one of the upper floors of the building. However, according to the first arriving command officer, the on-site building security staff was not aware of any fire condition within the building, nor were there any alarms indicated on the fire alarm system. Fire fighters who entered the building were receiving reports from civilians of fire on floors 7 through 10. It was later determined that there were fires in five separate electrical rooms.

The fire department ultimately transmitted five alarms, bringing approximately 300 fire fighters to the scene. Despite the large amount of fire suppression resources that were committed, it took fire fighters approximately 4 hours to extinguish the fire. The fire had become deeply entrenched in the electrical wiring system in five separate electrical rooms on several floors. Five civilians and 12 fire fighters were injured during this fire.

According to the New York City Fire Department, the cause of the fire was electrical. The area of origin was an electrical room on the fifth floor where service entered the building and was then distributed to other locations within the structure. Cabling within this room ignited, generating heavy quantities of smoke. Four other electrical rooms then also caught fire, also generating large quantities of smoke.

In the room where the initial fire occurred, the cabling was in open cable supports. Over the years, as additional cabling was added, it was packed into these cable supports in such a way that there was no longer any clearance between the cables, or between the cables and the structural I-beam under which they passed. While NFPA's investigators could not determine the actual nature of the original electrical fault, it is believed that at some point these burning cables lost the protection provided by their insulation and grounded to the structural support. This caused a large flow of current to occur through this large mass of cables. The cabling in four other separate electrical rooms on two floors that were used for distributing the electricity to several floors also caught fire.

The fires presented a challenge for the New York City Fire Department because of the varied locations of simultaneous fires and the confusing layout of the building. When fire fighters entered the building to search for the fire on the 10th floor, smoke conditions were very heavy. Fire and smoke spread beyond the rooms involved due to a number of unprotected horizontal and vertical openings.

The Rockefeller Center is actually a complex of buildings that are interconnected. The highest building in the complex is 70 stories. The building in which the fire occurred was 11 stories high and was occupied by a number of different tenants. Based on the usage of this building, per the NFPA 101®, *Life Safety Code*®, this building would be classified as an existing business occupancy. The building was equipped with a fire alarm system that was comprised of smoke detectors (ceiling and duct), pull stations and flow switches. It was monitored by an on-site security staff. The ground floor and lower levels were sprinklered, but none of the upper stories in the building were sprinklered. Fire standpipes were located in the stairwells and within the floors.

This incident was analyzed using current NFPA documents. These included the following, among others:

NFPA 1	<i>Fire Prevention Code</i>
NFPA 13	<i>Standard for the Installation of Sprinkler Systems</i>
NFPA 70	<i>National Electric Code®</i>
NFPA 101	<i>Life Safety Code</i>

Based on the NFPA's investigation and analysis of this fire, the following are considered significant contributing factors to the loss of property in this incident:

- Inadequate circuit protection. High current flows within the electrical system allowed the cabling in five separate rooms to ignite.
- Lack of adequate space for electrical conductors to safely dissipate heat. This lack of space allowed for a buildup of heat that impacted upon other conductors and degenerated the insulation on the conductors.
- Unprotected vertical and horizontal penetrations. These openings allowed the smoke to spread from beyond the electrical rooms and into the occupied floor areas.
- Lack of sprinkler protection in the areas of the fires. Sprinklers have a proven track record in all occupancies for safely controlling a fire in its early stages.
- Lack of smoke detection in the areas of the fires. If the fires had been detected earlier, they probably would have been easier to extinguish.
- Failure of the building fire alarm system to transmit the alarm. This failure of the alarm system could have been an extremely significant factor if the fire had occurred during the day when the building would have had a large number of occupants.
- Confusing building layout. Fire fighters had a difficult time locating the fires because of the floor layout which delayed their extinguishment.
- Multiple points of origin. This created the need to have a large number of resources on the scene to suppress the separate fires. Not many cities would have the ability to quickly mobilize such a quantity of personnel and equipment.

While not a significant contributing factor to the initial fires and subsequent fire spread, there is some concern

regarding the actions that were taken following the fire. As part of the effort to restore electrical power throughout the building as quickly as possible and to allow the occupants to resume operations, the following steps were being taken that could have potentially led to further complications:

- Numerous stairwell doors were propped open to allow for ventilation because the HVAC system was not operating.
- Temporary power cabling was being run through the building through open doors and through holes in walls and floors. These openings were unprotected.
- Floors were occupied during the restoration phases by television network personnel. However, the egress routes on some of these floors were obstructed by large spools of wire that had been brought in to restore service.
- Since there was limited power being provided in many areas, normal lighting was not available and alternative methods, such as candles, were being used to illuminate some areas.

This is another fire in a long line of high-rise fires where the lack of a fire sprinkler system in the building is a significant contributing factor to the loss. There have been a number of significant fires over the years in high-rise buildings that were not equipped with sprinkler systems where the outcome would have been significantly different had one been installed. Other high rise fires, which have been investigated by NFPA include:

- *First Interstate Building in Los Angeles*
- *One Meridian Plaza in Philadelphia*
- *DuPont Plaza Hotel in Puerto Rico*
- *Hotel Fire in Pattaya, Thailand*
- *MGM Grand Hotel in Las Vegas*

Fires in high-rise buildings are very challenging to fight. Every effort should be made to ensure that the life safety of the occupants and those responding to the fire is protected through the use of current technology and codes and solid fire prevention and inspection programs.

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The National Fire Protection Association's Fire Investigations Department documents some of the most significant fires and incidents throughout the world. The objective of these investigations is to determine what lessons can be learned from these incidents. This information is then made available to the fire safety community to be used in developing future codes and standards. A complete listing of reports is available, either upon request or can be viewed on our web page.

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A full copy of this report is available through NFPA's Charles S. Morgan Library. To order this report, or any other NFPA Fire Investigations Report, please contact them at the following numbers:

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