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NATIONAL FIRE PROTECTION ASSOCIATION

INTERNATIONAL

Preliminary Report NFPA Fire Analysis Department New York Telephone Exchange Fire New York, New York February 27, 1975

From an NFPA investigation conducted by James K. Lathrop, NFPA Fire Analysis Specialist.

A five alarm fire in a New York Telephone Exchange switching center on the lower east side of New York City impaired telephone service to 12 exchanges. The fire which began in a basement cable vault extended to the 1st and 2nd floors via verticle telephone cable raceways, and destroyed virtually all telephone switching equipment on the 1st and 2nd floors. Damage occurred to the 3rd floor and the extent of damage to the upper floors of the 12-story building is yet to be assessed. Over 150 firemen were injured most from inhalation of the smoke given off by the PVC insulation.

Background

This 12-story building was essentially of fire resistive construction and measured approximately 200-ft.-x-75-ft. In the basement was a 200-ft.-x-20-ft. telephone cable vault. Aside from the vault also located in the basement was various electrical equipment for the telephone company. The 1st and 2nd floor was almost exclusively automatic telephone switching equipment. The 3rd floor was offices. Upper floors were combination of telephone switching equipment and offices. The building served 12 exchanges and over 170,000 customers in lower east side of New York.

Fire Incident

The fire was discovered shortly after midnight on Thursday, February 27, 1975 by employees working in the basement. At this time smoke was noticed coming from a cable vault which was unoccupied. The fire department was notified immediately. Upon arrival of the fire department smoke and fire had already extended from the cable vault onto the first floor. The fire was not brought under control until late that afternoon. A total of five alarms plus special calls were sounded. The fire extended from floor to floor by

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the verticle telephone cable raceways all of various types. Major cable raceways were inside terre cotta external walls while other raceways were basically wires extending through holes in the floor. Some of these holes were protected with fire retardant bags stuffing material. These had a minor effect on the retarding extension of the fire.

Analysis

This fire drastically points out the need for complete reevaluation of the fire protection for telephone exchanges. The spread of the fire and the smoke given off by the PVC created extensive problems for the New York City Fire Department and tenants that lived in that area. In today's world which relies so much on the telephone the loss of the telephone service can have a serious impact. Calling emergency service such as ambulances, police and fire was almost eliminated in this area of New York City. Had this occurred in a highly commercialized area of New York such as lower Manhattan the economic impact could be devastating.

A second trip to New York is planned to obtain follow-up information on this fire.

Investigation Report
New York Telephone Fire
New York City, New York
February 27, 1975

Prepared by

Fire Analysis Department
National Fire Protection Association
In Cooperation With
National Bureau of Standards
U.S. Department of Commerce

1. Location: 13th Street and 2nd Avenue
New York City, New York
2. Time: 12:25 AM
Thursday
February 27, 1975
3. Occupancy: Telephone Exchange Automatic Switching Center
4. Owner: New York Telephone
5. Damage: Estimates vary \$30-\$60 million
6. Injuries: 176 fire fighters with various degrees of injuries-almost all from smoke inhalation. Unknown number of area residents with smoke inhalation.
7. Construction: 11-story, 100-ft-x-280-ft
Exterior walls-brick
Floors-reinforced concrete slab
Columns-first thru fourth; reinforced concrete
fifth up: structural steel in concrete
8. Building Layout: In the basement was a 20-ft-x-20-ft-x-280-ft telephone cable vault where cables entered the building from the street. Aside from the vault also located in the basement was various electrical power equipment for the telephone company. The 1st and 2nd floors were almost exclusively automatic telephone switching equipment. The 3rd floor was mostly vacant at the time, with some offices, while upper floors were a combination of telephone switching equipment and offices. On the 1st floor directly above the cable vault was an area 20-ft-x-280-ft, which housed the main distribution frame. This area was separated from the rest of the first floor by a non-rated metal and glass, dust partition. The building serviced 12 exchanges and over 170,000 phones in the lower east side of New York City.

9. Cables:

The cables in the cable vault were lead sheathed, or Polyethylene or PVC over metal sheathed, with paper pulp or PVC conductor insulation. The cables on the 1st and 2nd floor were for the most part older with various types of insulation, however, there was a considerable amount of cable sheathed with PVC¹ with interior wire insulation also of PVC.

To extend the cables from the basement cable vault to the main frame on the 1st floor a slot 6-in-wide and 275-ft-long with metal-cover plate was provided in the floor. After cables were run through the slot, transite cover plates were fitted over the remaining openings. Cables from the vault to upper floors were run vertically through a terra cotta block wall against the inside of an exterior wall. Extending smaller cables between floors was done via vertical cable racks going through the floors. These smaller openings were protected with small fire retardant bags which were placed around the cables in a hole. These were made of a mineral-wool filling inside a fire retardant treated cotton bag. A sample has been forwarded to the NBS. After the cables were run through, a steel plate was fitted at the bottom of the hole. The bags were then fitted around the cables and a transite plate fitted over the top. As the floor slabs were approximately 7-1/2-inches, this resulted in about 7-1/2-inches of bag protection.

10. Fire Protection:

Automatic sprinkler protection was provided in trash rooms, and other areas, such as these, however, there was no sprinkler protection in the area of the fire. Ionization type smoke detectors were provided in the power rooms and in the main frame room on the 1st floor. These were spaced on 400-sq-ft maximum area coverage per detector. In addition, a heat sensing wire was installed within the equipment frames throughout the building. Both the ionization detectors and the heat sensing wire sounded a

1. In order to reduce the combustibility of the PVC, Antimony Trioxide is added to the plasticizer when making the cable insulation, an additional additive is used as a smoke suppressant.

coded alarm through the building. This was a local alarm only.

11. Ignition
Sequence:

Fire appears to have started in a basement cable vault reportedly by a short circuit.

12. Narrative:

Shortly after midnight on February 27, 1975, employees in the building discovered the fire. At this time smoke was noticed in the main distributing frame area. The Fire Department was immediately notified by street box and records the alarm at 12:25 am. A total of five alarms plus special calls were sounded. One-hundred-and-seventy-six fire fighters, in addition to some civilians were injured, most from inhalation of smoke given off by the cable insulation. The fire extended from the basement vault to the first floor through the 6-in-x-275-ft slot provided to feed cables to the main frame. It then travelled to the 2nd floor via cables in the vertical cable racks. There was some minor extension of heat to upper floors by the cables in the vertical cable racks also. The fire retardant bags had an effect in retarding the spread of the fire. The long duration of the fire (16 hours) in combination with heat conduction through the wires limited this effect. The bags provided at the floor openings in the 3rd and 4th floor slabs assisted in preventing significant fire spread beyond the second floor. The fire was brought under control late that afternoon.

As a result of the fire the Bell System is currently reviewing the fire protection requirements of its exchanges. The spread of the fire and the smoke given off by PVC created extensive problems for the New York City Fire Department.

Although the smoke detectors did operate it is undetermined when they operated, and preliminary investigations do not indicate, if detection or alerting was delayed.

In today's world which relies so much on the telephone, the loss of telephone service can have a serious impact. The ability to call emergency services, such as, ambulances, police and fire was almost eliminated in this area of the city. A vital telephone link in the police radio network was destroyed resulting in a mandatory move of dispatchers. One of the four exchanges serving the 911 emergency system was involved, thereby reducing the 911 capability. The local fire stations lost telephone and vocal alarm system and had to return to the telegraph dispatch system. The municipal box alarm system was not affected.