The Hartford Hospital Fire

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This account differs in some detail from the preliminary report circulated with the January 1962 issue of Fire News, having been expanded in the light of additional information. It has, however, been prepared prior to the release of the official report by the Connecticut State Fire Marshal and deliberately omits mention of subsidiary details that might divert attention from the more significant factors. If further significant information becomes available it will be brought to the attention of NFPA members.

Fire in the Hartford Hospital, Hartford, Connecticut, on December 8, 1961, killed 7 patients, 4 employees, and 5 visitors. Fire originated in a rubbish chute, burst out a chute door on the ninth floor, and roared down the corridor, feeding on combustible interior finish. Some of the occupants of the ninth floor escaped down the enclosed stairways, others were trapped in rooms. Those of the trapped who kept room doors closed and placed wet bedding around the cracks of the doors survived.

Hartford Hospital has been described by some, including its architects, in such terms as "one of the safest buildings in the world." The fire itself has been described as a freak — something that could happen only once in a lifetime. Looking down the ninth floor corridor before the fire, most people would have said that it would be preposterous to assume that a fire of any proportions could occur there. It just couldn't happen in this brick and concrete building, which was designed and constructed in accordance with the building and safety codes of the day, with its sprinklered hazardous areas, its smoke-stop doors, its enclosed stairways, its alarm system, and its employee training.

But it did happen. And the flaws were very obvious after it happened, such as delayed alarm, hazardous rubbish handling chute, combustible fiberboard ceilings in corridors, partial sprinkler protection, and other defects.

Construction Features

The 13-story, with basement and subbasement, fire-resistive building with white glazed brick exterior finish was completed in 1948. Partitions are of utility tile and plaster with linoleum wainscoting and a plastic-covered fabric finish above. The basement, subbasement and thirteenth floors (service areas) were sprinklered because they were considered to be hazardous areas.

The metal rubbish chute, where the fire started, was approximately 22 inches in diameter and extended from the subbasement to the thirteenth floor with a 3-inch vent pipe at the top. Also at the top of the chute was one 165-degree sprinkler. An aluminum door opened directly from the chute into the corridor at each floor.

The chute doors were flush with the wall and were self-closing by use of a spring-type, side mounted hinge. Some of these doors closed and latched under pressure of the spring and some didn't. The present NFPA Standard for Incinerators and Rubbish Handling, NFPA No. 82, 82A, calls for service openings to be equipped with self-closing fire

Editor's Note: This report is based in part upon evidence collected by Mr. Juillerat, Rexford Wilson, NFPA Fire Record Editor, and Robert S. Moulton, Secretary, NFPA Committee on Safety to Life, who visited the scene of the disaster the day after it occurred.
Floor plan of the ninth floor showing locations of the rubbish chute, smoke-stop doors and victims’ bodies. This drawing is only approximately to scale; doors and other details are not shown. The corridor was about 300 feet long from north to south.
doors and for each service opening to be located in a room or compartment cut off from the rest of the floor by fire walls or fire partitions. While this standard was not adopted until 1948, after the hospital had been built, the arrangement of the chute doors was nevertheless in violation of the long-standing NFPA requirement for the protection of vertical openings by standard fire doors.

The chute terminated at the subbasement level with a 90 degree elbow and an aluminum door from which rubbish was taken manually and hauled in carts to the incinerator nearby. Rubbish was allowed to collect in the bottom of the chute between incinerating operations, and apparently it was not uncommon for the accumulation to catch fire, possibly from lighted cigarettes being thrown down the chute. These fires were usually extinguished by hospital personnel. The fire department was called if there was a noticeable amount of smoke, or fire was found in the chute. One such previous fire caused some small damage and filled upper floors with smoke. The openings to the chute were almost the same diameter as the chute itself, which permitted stuffing material into the chute in such a way that it might become clogged, which evidently happened in this case as the single sprinkler in the top of the chute did not operate until well after the fire had broken out on the ninth floor.

In the center section of the building were two banks of four elevators each and a large enclosed stairwell with standpipe connections at each floor. (See diagram.) The center section of the ninth floor contained, in addition to these facilities, various types of service rooms and areas — kitchens, treatment rooms, and others. In the three-wing sections at the north and south ends of the center section were nurses' stations and patients' rooms.

![Hartford Times](image)

A portion of the rubbish chute which was dismantled and confiscated by state officials shows the elbow at the bottom where rubbish collected and the weighted aluminum door from which the rubbish was pulled. The pipe nipple on the bottom served as a drain. The distortion from heat can be seen on the section of chute.
The corridor ceiling on the ninth floor, as on other floors in the hospital, was of combustible fiberboard acoustical tile mounted by an adhesive to gypsum lath. This adhesive apparently was subject to softening under the influence of heat. The 16-inch by 4-foot gypsum lath was attached to suspended metal supports by metal clips at the edges and wire loops in the center. There was a nongreased open space between the ceiling and the concrete floor structure above. This space, about 18 inches high and 8 feet wide, extended over the smoke doors at each end of the center section corridor.

There was a wainscotting of linoleum, and the floor was covered with linoleum. A fabric wall covering was on the upper part of the corridor walls.

The 8-foot-wide metalclad, wood-core smoke-stop doors in metal frames at each end of the center section corridor were manually-closing, single-swing doors. Their effectiveness as smoke barriers was reduced by the open concealed space which extended over them above the combustible ceiling.

In addition to the large stairway in the center section, there was one enclosed stairwell near the corridor intersection in the north section and another in the south section. These stairways were so located that there were dead-end corridors through which occupants would have to travel toward the fire to reach an exit. This is specifically covered in the Building Exits Code which for many years, prior to 1948, provided that "Exits shall be so arranged with regard to floors that there are no pockets or dead ends of appreciable size in which occupants may be trapped." Later, this provision was made more specific, and a maximum distance of 30 feet of dead-end travel was permitted. In the Hartford Hospital, this distance was far exceeded, as may be seen from the plan.

Fire in the Rubbish Chute
Some 5,500 pounds of trash came down the "for waste paper only" rubbish chute each day, sometimes including bottles, ether-soaked rags, rubber gloves, clothing, and other items. On December 8, the employee who handled the rubbish at the bottom of the chute had cleaned it out before going to lunch. Sometime after returning from lunch the employee went to the chute to remove the new accumulation of rubbish. He later testified that when he opened the door at the end of the chute, he discovered fire in the chute. He immediately went to the main floor level and directed water from a standpipe hose through the door and down the chute. He was aided in this operation by an office employee. Another employee in the subbasement, after being alerted, pulled rubbish from the chute until the burning material dropped down. He then used a garden hose to wet down the rubbish. Various persons reportedly watched the attempt to extinguish the fire for an undetermined period, at least six minutes and possibly longer. No one called the fire department.

![Image](https://example.com/hartford-times.png)

The fateful rubbish chute (left) and a laundry chute next to it extended from subbasement to thirteenth floor. The laundry chute was not involved. The self-closing aluminum doors are missing from both chutes in this photograph.
Firemen and others inspect the damaged south section of the ninth floor. The undivided ceiling space can be seen above the metal strips which supported the ceiling.

Meanwhile, black smoke was beginning to come out around the chute doors on upper floors a little more than it had during previous chute fires. A nurse on the twelfth floor operated the alarm box on that floor and ordered an aide to put tape around the chute door to keep the smoke from seeping out. This alarm went directly to fire alarm headquarters at 2:39 p.m.

**Fire on Nine**

On the ninth floor smoke was also noticed coming from around the chute door, and the supervisor of nurses asked another employee to call in to report a fire in the chute as she closed the south smoke door and began closing doors to patients’ rooms. At the time of the fire there were 793 patients in the hospital, 108 of whom were on the ninth floor. There were also reportedly 100 employees and visitors on the ninth floor.

An employee working in the corridor about 20 feet north of the chute said he saw the chute door blow off and a burst of flame come out. He fled to the north and closed the north smoke door. The second alarm from hospital personnel went in at 2:40 from the ninth floor.

The exact sequence of events on the ninth floor at this time and the precise conditions in the rubbish chute which caused the burst of flame at the ninth floor probably will never be known. In any case, unburned fire gases appear to have built up in the chute. These gases may have burned, blowing out the chute door on the ninth floor. Why it happened to the ninth floor instead of any other floor is unknown. Possibly the door was not latched. Possibly this door was the weakest in the series of doors up and down the chute. The waterfall from the sprinkler in the top of the chute transmitted an alarm directly to fire headquarters at 2:41.

Whatever the conditions were in the chute, the blast of fire from the chute door ignited the combustible ceiling tile in the corridor and flames roared down the hallway. It was described by those in the area as "like a flame thrower" or "like a blast furnace." Flames were reported to have been progressing down the ceiling as the fire spread to the north and to the south. The fire was so intense that even the waxed linoleum floor was reported burning, and the linoleum wainscoting was consumed. The north smoke door held, and those on the other side of the door were safe, but at the south smoke door a different story was unfolding.

The nurse who closed the south smoke door is positive that it was securely latched, and others who had been on the floor said that the door was closed, and they saw smoke coming over the top of the door. Smoke also was spreading beyond the door into the south wings by means of the concealed space above the ceiling. Another question
The north smoke-stop door which was at the end of the center section corridor away from the origin of the fire on the ninth floor suffered only a small amount of smoke discoloration. Note, however, the blackened concealed area which was exposed when the tiles were pulled down.

The south smoke-stop door which apparently was opened sometime during the fire is shown in open position. Although the corridor was charred extensively in this area, the wall finish behind the door suffered little damage, showing that the door had been opened. Also note the open ceiling space extending over the lintel of the door.
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that may never be answered is how or why the smoke door was opened at the height of the fire. Evidence points to the fact that shortly after the fire started on the ninth floor this south smoke door was manually opened, allowing the flames to sweep into the south wings where patients, employees, and visitors were holed up in the rooms. How soon this door was opened and how fast the fire spread was indicated by a ceiling-mounted clock at the corridor intersection in the south section. It burned out at 2:431/2, just 41/2 minutes after the first alarm went in.

Arriving fire fighters under the personal direction of Chief Thomas Lee were therefore met by an unbelievable situation—a raging inferno on the ninth floor of a "fireproof" hospital with people at the windows waiting to be rescued. Because the extended front entrance foyer on the ground floor of the hospital building prevented placing aerial ladders close to the fall center section, the 100-foot ladders reached only to the eighth floor, but firemen at the top of the ladders gave instructions to the people at the ninth floor windows, advising them to keep the doors closed, use wet bedding around the doors, and remain calm until they could be rescued. Those who acted upon this good advice lived to escape unharmed. Where doors to patients' rooms did not stay closed, the occupants perished. The lack of positive latches may have been a contributing factor here. The hospital staff is to be commended for keeping stair doors closed though these doors had no latches (as required by the Building Exits Code) and were held closed only by door closers. Closed stair doors retarded the spread of smoke and prevented the spread of fire to other floors, thus probably saving many lives. Some smoke spread to upper floors through elevator shafts and chute doors.

The fire caused six of the eight elevators in the center section to stop, and one group of passengers, who were trapped at the ninth floor level, had to climb out a hatch in the top of the elevator and through the tenth floor door. This took some time during which they were protected by water spray from a fire department hose.

The bone-wearring task of carrying hose up to the ninth floor, to supplemental standpipe hoses, and bringing the intense fire under control was tackled with the selfless courage so often demanded of those in the fire service. Hospital employees, firemen and policemen evacuated patients on the eighth to the twelfth floors horizontally to the north wings and some vertically from the ninth to the eighth. Firemen ventilated upper floors and quickly extinguished the last of the flames on the ninth floor where they were confined. The blackened corridors and rooms and 15 bodies bore mute testimony to the fact that disastrous fires can occur even in fire-resistive buildings. A sixteenth victim died the following day.

Investigation

Before the smoldering ruins of the ninth floor had completely cooled, State Police Commissioner Leo J. Mulcahy and Deputy State Fire Marshal Carroll Shaw, City Fire Chief Thomas Lee and their staffs had set about to determine exactly how this fire had started and why it had taken so many lives. Samples of the ceiling tile, taken by the State Fire Marshal's office immediately after the fire, were flown by Marshal Shaw to Underwriters' Laboratories, Inc., in Chicago and were found to have a flame spread rating of 180 when applied with adhesive to gypsum board, as they were in the hospital corridor. Although at the time the hospital was built there were no NFPA requirements
Firemen, policemen, and hospital employees carry a patient in bed to safety from fire-scarred south wing. This scene points up the difficulties encountered and the manpower required to evacuate bedridden hospital patients. The Building Exits Code is based on the idea of rolling bed patients through smoke-stop doors to places of safety.

Workers begin the grim task of recovering bodies of the victims. A small amount of the gypsum lath can be seen still suspended from the ceiling structure. All of the combustible ceiling tile fell and burned in this area.
on interior finish flame spread, due to lack of agreement as to how flame spread should be tested and what the limits should be, the hazard had been clearly demonstrated by fire experience, and an attempt had been made to deal with it by applying flame retardant paint. The present NFPA Building Exits Code calls for interior finish in hospital corridors to have a flame spread of 25 or less.

The linoleum wainscoting was similarly tested and found to have a flame spread rating of 300, as measured by NFPA Standard No. 255. While this contributed to the fire spread, it seems unlikely that combustible material on the lower part of the wall would have burned so furiously if it had not been exposed to radiated heat from above, and to the burning of ceiling tiles that fell to the floor.

Where they were closed, the 1 3/4-inch-thick solid wooden doors to the rooms held in most cases for the short duration of the intense fire on the ninth floor, but the margin was thin. Some came within a quarter of an inch of burning through. At least one burned entirely through around the metal lock mechanism. The alert nurse in this room quickly put a water-soaked pillow over the area, and it held just long enough to save the three occupants of the room.

While the rubbish chute fire and the delayed alarm were important factors in the spread of fire to the ninth floor, the primary cause of the great loss of life was the combustible fiberboard ceiling tile, which, when ignited, allowed the fire to spread unchecked down the corridor. How many of the 16 lives lost would have been saved had the corridor ceiling been of noncombustible material or how many would have survived had the ninth floor been sprinklered cannot be determined for certain. Probably all of them. If the smoke-stop door had not been opened, all but three lives probably would have been saved. How many of these lives might have been saved if the exits had been properly located is another moot question. Ignition need not come from a rubbish chute fire; it could come from a fire originating in any number of other ways.

After the fire the hospital hired a fire protection expert to study all the facilities of the hospital and make recommendations to ensure the safety of the patients and employees.