

**MOTEL FIRE**  
Dayton, OH  
November 23, 1983



# **FIRE INVESTIGATIONS**

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Investigative Report

Travel Master Inn Motel Fire  
Dayton, Ohio  
November 23, 1983

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In Cooperation with

Federal Emergency Management Agency/  
United States Fire Administration

and

National Bureau of Standards/  
Center for Fire Research

This investigation was conducted by the National Fire Protection Association (NFPA) under an agreement with the Federal Emergency Management Agency/United States Fire Administration (FEMA/USFA) and the National Bureau of Standards/Center for Fire Research (NBS/CFR). The investigation was jointly funded by these agencies and the NFPA.

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## ABSTRACT

On Wednesday, November 23, 1983, a fire occurred at the Travel Master Inn Motel located at 225 W. First Street in Dayton, Ohio. The motel was a rectangular, four-story building, with basement, of mixed construction. The ground floor contained a registration and lounge area, and the upper floors contain 66 guest rooms.

Earlier in the evening, on November 23, the building's fire detection and alarm system sounded throughout the building. The hotel's desk clerk deactivated the system and went to the guest room portion of the building to determine the source of the alarm. The clerk discovered a trash can fire in the third floor exit corridor and extinguished it with a portable fire extinguisher. The detection system was not reactivated due to the residual smoke present in the corridor. Approximately two and a half hours later, a third floor guest notified the desk clerk of a fire on the third floor. The fire department was notified at 4:01 a.m.

First arriving fire fighters observed fire and heavy smoke conditions showing in the top two floors at the north end of the building. In addition, an estimated 25 guests were located at windows on all the guest room levels awaiting rescue. The fire ultimately resulted in one fourth-floor fatality, in over 20 persons were injured and in an estimated \$700,000 property damage.

Fire investigators have listed the cause of the fire as undetermined; however, they determined that the fire originated at the north end of the third floor exit access corridor.

The following are considered to be major factors contributing to the loss of life and injury in this incident:

- The location of the area of origin in the exit access corridor and lack of automatic extinguishment in the incipient stage;
- The presence of highly combustible interior finish materials in the exit access corridor;
- Rapid spread of the fire to the fourth floor through an unprotected vertical opening;
- The deactivation of the hotel's automatic fire detection and alarm system;
- The lack of prompt notification of the fire department.

## I. INTRODUCTION

The National Fire Protection Association (NFPA), with the assistance of the Building Officials and Code Administrators International (BOCA), investigated the Travel Master Inn Motel fire in order to document and analyze significant factors that resulted in the loss of life.

This study was conducted under a major fires investigation agreement among the Federal Emergency Management Agency/United States Fire Administration (FEMA/USFA), the National Bureau of Standards/Center for Fire Research (NBS/CFR), and the NFPA. The agreement, funded by the FEMA/USFA, NBS/CFR, and the NFPA, provides for the investigation of technically significant fires by the NFPA's Fire Investigations and Applied Research Division to document and analyze incident details and report lessons learned for loss prevention purposes.

The NFPA was assisted in data collection and analysis by the Building Officials and Code Administrators International (BOCA) under an agreement among NFPA and three model building code organizations to investigate significant structural fires throughout the United States. In addition to BOCA, the other cooperating building groups are the International Conference of Building Code Officials (ICBO) and the Southern Building Code Congress International (SBCCI). The three model building code groups support NFPA by lending technical staff support for on-site field work and a building code analysis.

The NFPA became aware of the fire on the day of occurrence, November 23, 1983. Thomas Klem, Director, Fire Investigations and Applied Research Division, traveled to Dayton, Ohio to document the facts related to the fire. The NFPA investigator was joined and assisted by Bruce Larcomb of the Building Officials and Code Administrators International. A three-day on-site study and subsequent analysis were the basis for this report and NFPA's

analysis of the event. Entry to the fire scene and data collection activities were made possible through the cooperation of the Dayton Fire Department. The report presents the findings of the NFPA data collection and analysis effort.

This report is another of NFPA's studies of fires having particular educational or technical interest. The information presented is based on the best data available during the on-site data collection phase and further data acquired through subsequent follow-up. It is not NFPA's intention that this report pass judgment on, or fix liability for, the loss of life and property at the Travel Master Inn Motel.

The cooperation and assistance of Dayton's Fire Director, Glenn Alexander, Charles W. Ford, Fire Protection Engineer, Bureau of Fire Prevention and, other members of the Dayton's Fire Prevention Bureau is acknowledged and appreciated.

Special thanks is given to Mr. Bruce Larcomb of BOCA for his on-site assistance in the data collection phase and for his input to the report writing process.

## II. BACKGROUND

### The Building

The Travel Master Inn Motel, located in the downtown section of Dayton, Ohio, offered discount rates to travelers. Since its construction in 1959 the motel has undergone several changes of name and ownership. In addition to overnight guests, several occupants were thought to have had a more permanent residence in the building. The four-story building with basement had 22 guest rooms on each of the three guest room floors. On the night of the fire, it is believed that 34 rooms were occupied by approximately 55 guests.

The structure most nearly resembled protected combustible construction (Type III (200) construction per NFPA 220-1979, Standard on Types of Building Construction and Type 3B construction according to the 1984 edition of the Basic/National Building Code). Apparently, the design intent was to provide 1-hour fire rated exit corridors (20 minute doors with closers) and 2-hour stairway enclosures. The exterior walls were 8-inch concrete block with 4-inch brick facing. The first or ground floor level was reinforced concrete. The second, third and fourth floors were 3 inches of poured concrete on metal deck supported by unprotected steel beams and columns. The roof was of built-up materials on metal deck supported by unprotected steel bar joists and steel columns.

The ground floor area of the building contained a small lobby, registration desk area, restaurant and guest parking. Guest parking was provided in an open unenclosed area located directly under the upper floors (approximately 50 percent of the total ground floor area) and separated from the occupied areas by masonry materials. The basement of the building contained the power plant, laundry, and subgrade parking. Guest rooms were located on the second through fourth floor levels.



The main entrance to the building was from First Street into the lobby-registration area. Located just off the lobby-registration area were an elevator and one of the building's two enclosed stairways. All four sides of the building were accessible for fire fighting.

The building was approximately 44 feet by 186 feet, and contained two enclosed interior stairways, with fire-rated door assemblies, at opposite ends of the centrally located, 160-foot exit access corridor (see Figure 1). Exit markings were provided at the entrances to the stairways and battery operated emergency lighting was provided in exit access corridors and within the stairways. Plate glass window, approximately 3 feet by 4 feet, was provided at the north end of the exit access corridor on the guest room levels. Two metal trash containers were located in the north end of the corridor on each guest room floor.

Each of the guest rooms was approximately 13 feet by 17 feet. Access to the rooms was from the centrally located exit access corridors. Each guest room contained an operable window and typical motel furnishings. In addition, each room contained a wall-mounted, a-c powered, ionization type individual smoke detector. The detectors were not connected to the central fire alarm system. Guest room doors were 1 3/8-inch metal doors, in metal frames with closers.

The ceilings in the guest rooms on all floors were 1/2-inch gypsum board attached to a suspended steel grid. Some areas also had a 12-inch by 12-inch acoustical fiberboard cemented to the gypsum board. Corridor walls and interior partitions were 2-inch by 4-inch wood studs, insulated with mineral wool material, with 1/2-inch gypsum board on both sides. Corridor wall interior finishes included 3/16-inch plywood or pressed board paneling and, in some locations, 1/4-inch plywood paneling attached to the gypsum board with an adhesive material and nails. The floor covering in the exit access corridors was carpet with a foam underlayment.

The corridor ceilings on the second and third floors were 1/2-inch gypsum board on 2-inch by 4-inch wood joist and framing. The fourth-floor corridor ceiling was 1/2-inch gypsum board on a suspended metal grid. Wood framing for corridor walls was present in the approximately 3-foot void space between the finished ceiling and the underside of the roof deck. Penetration of the ceiling membrane by ceiling mounted fan-coil units to the individual guest rooms voided the attempt to provide one-hour ceiling fire resistance rating in the exit access area. Make-up air for the units was taken from the corridor through a ceiling mounted transfer grill located in the guest room entrance alcoves.

Metal laundry chute, approximately 12 inches by 18 inches was provided in the north end of the exit corridor. The non-fire rated chute ran from the basement area to the fourth floor of the building and was framed with wood studs and finished with plywood paneling. The chute also had openings at each floor level which were non-fire rated. Building plans reviewed during the on-site survey indicate that the original design called for the chute to be located in the maid's storage room which was designed to provide a 1-hour fire rated enclosure.

#### Fire Protection Systems

Using a provision of the State of Ohio's Fire Code\*, local and state fire officials had recently required the motel owner to install certain retrofit fire protection provisions to increase the level of fire safety in the building. This was part of a program to upgrade the level of fire safety in hotels/motels in both Dayton and the entire State. As a result, the owner had installed a new automatic fire detection and alarm system, individual guest

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\*The hotel's annual licensing requirement prompted an inspection of the building. The Ohio State Fire Code references the State's Building Code (1982 BOCA Building Code).

room smoke detectors, and self-closing devices on guest room doors.

The fire detection system consisted of photoelectric smoke detectors in exit access corridors, manual pull stations located near stairways, combination fixed-temperature/rate-of-rise detectors located in the basement and some storage areas, and alarm bells located in the public access areas. Smoke detectors and manual pull stations were located in the first floor lounge and registration area, and in the corridors on the upper floor levels. Corridor smoke detectors were on a 42-foot spacing. The zoned annunciator panel was located in the registration area. Zone 1 provided indication of an alarm for the basement area; zone 2 for the ground floor area, and zones 3, 4, and 5 were for guest room floors 2 through 4, respectively. The system was arranged to automatically sound alarm bells on activation of smoke detectors, heat detectors and manual pull stations. The system was not arranged to automatically notify the fire department.

The building was partially protected by a dry-pipe, automatic sprinkler system. The partial system was remote from the fire area, and was not a factor in this incident. The building was not provided with a standpipe system. The building was provided with 2 1/2 gallon pressurized water fire extinguishers spaced along the exit corridors.

### III. THE FIRE INCIDENT

#### Fire Discovery

At approximately 1:30 a.m., the fire detection system activated throughout the building and the desk clerk noted that the signal was for zone 4 (the third floor area). Apparently because of previous "false alarms," the desk clerk took action to silence the alarm bells throughout the building. He then left the front desk area and went first to the fourth floor level and then to the third floor.\*

Once on the third floor, the clerk discovered a fire in one of the trash cans adjacent to the north wall of the corridor and extinguished it with a pressurized water extinguisher. He then removed the trash can from the corridor. The clerk returned to the registration area, but did not notify the fire department. Apparently, the clerk also did not reactivate the detection system due to the amount of residual smoke that remained in the corridor.

During the next hour the desk clerk reportedly returned to the third floor several times and found no evidence of fire, but he did find lingering smoke in the corridor. At one time he opened the corridor window and attempted to clear the smoke. During this time the desk clerk also attempted to reactivate the fire detector and alarm system; however, the system would not reset.

At approximately 3:45 a.m., a third floor guest called the registration desk and reported "thick smoke on the third floor." Once again the clerk returned to the third floor and on this trip he found fire conditions in the corridor severe enough that he could not make entry onto the floor. The clerk returned to the registration area and notified the fire department.

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\*The clerk apparently thought that zone 4 was for the fourth floor area.

Guests were aroused by several means during the next several minutes. Some individual guest room smoke detectors apparently began to sound alarms on the third and fourth floors. This allowed some guests to evacuate the building before untenable conditions were reached in the exit access corridors. Some of these evacuating guests knocked on guest room doors and yelled to notify other guests of the fire. Some guests were aroused by fire department apparatus. Guests checked corridor conditions and determined if they could use the exit access corridors and stairways for escape. Those who found untenable conditions in the corridors took refuge in their rooms. Untenable conditions were apparently reached first in the third floor exit corridor, and as the fire progressed, the fourth floor corridor also became untenable.

The fire department received an alarm for an undetermined fire at the Travel Master Inn Motel at 4:01 a.m. and dispatched four engines, two aerials and two district chiefs to the scene. On arrival fire fighters found fire and heavy smoke showing from the north end of the third and fourth floors of the building. In addition, they observed numerous guests at windows on all guest room floors awaiting rescue on both the east and west sides. Fire fighters called for additional assistance and began to place ground and aerial ladders to initiate rescues. Other fire fighters began to advance hose lines into the building and to conduct search and rescue efforts.

The weather in the early hours of November 23, 1983, was cloudy with the temperature just above freezing. During the suppression of the fire a heavy rain storm moved through the area.

During the early stages of the fire, fire fighters rescued an estimated 25 persons from the building over ladders and assisted others down stairways. Fire suppression crews positioned in the south end of the third-floor corridor experienced extreme heat conditions as they advanced hand lines toward the north end of the building.

Just after rescue efforts had been completed, fire fighters observed fire through the roof and within several guest rooms on the fourth floor. Fire fighters who were sent to the roof to ventilate reported to the incident commander heavy fire conditions and a weakening roof system. Fire fighters were removed from the building at this point and master streams employed to gain control of the fire. Every on-line piece of fire apparatus and over 100 fire fighters from the Dayton Fire Department were needed to bring the fire under control.

At one point in the fire, the officer-in-charge believed that some ten people were unaccounted for. Efforts were made to reconcile the difference between the guest list and those people who remained on the scene.

#### Casualties and Damage

The fire resulted in the loss of life of a 50 year-old guest who was found and rescued by fire fighters from the fourth-floor exit access corridor. In addition there were 18 civilian and 3 fire fighter injuries. The majority of the injured persons were treated at local hospitals for smoke inhalation.

There was severe fire damage to the third and fourth floors of the building. The ground and first floors received some smoke and water damage.

The fire on the third floor consumed or damaged much of the combustible wall finish material located in the exit access corridor. In the south end of the corridor the wall paneling was almost totally consumed. Fire damage was less severe toward the north end of the corridor; however, there was evidence of heavy soot deposits and some heat damage to the upper portions of the paneling in this area. Fire spread into third floor guest rooms was limited due to closed guest room doors and early fire suppression efforts. There was evidence of smoke penetration into guest rooms through gaps between the guest room doors and metal frames. Smoke penetration into the rooms was more pronounced in rooms closer to the area of origin than in the south end of the

third floor. The ceiling membrane did fail in the south end of the corridor; however, the wooden support joist in the area received no fire damage, indicating that the ceiling membrane performed as expected.

The damage to the fourth floor was much more severe. The fire was not only able to extend the full length of the exit corridor, but was able to extend into many of the fourth floor guest rooms. In addition, the fire was able to spread in the combustible void space between the finished ceiling and the roof deck. As a result of the intense fire on the fourth floor, there was partial structural collapse of the roof and other structural damage to many steel joists in the roof assembly.

#### IV. ANALYSIS

##### Discussion

Investigators from the Dayton Fire Department have listed the cause of the fire as undetermined; however, they determined that the fire originated at the north end of the third floor exit access corridor near the trash container and adjacent to the laundry chute. The initial materials involved in the early growth of the fire are believed to have been the wall paneling and wood framing materials.

The fire was able to develop and spread in the corridor until it was finally detected by a third floor guest. At that time smoke obscured most of the north end of the corridor, and a guest telephoned the front desk to report the fire. The clerk returned to the third floor to find heavy heat conditions and the corridor filled with smoke. The clerk returned to the registration area and notified the fire department.

The fire department received the alarm at 4:01 a.m., and first arriving fire fighters found fire showing from the north end of the building, guests

positioned at windows on all the guest room floor levels and heavy smoke conditions throughout the upper two floor levels. Fire fighters moved quickly to rescue an estimated 25 guests over fire department ladders and to suppress the fire. Fire fighting operations were complicated by the number of occupants to be rescued, the severity of the developing fire, and the roof collapse.

The rapidly developing fire on the third floor spread to the combustible wall paneling in the corridor and soon penetrated the fourth floor through the non-fire rated laundry chute. Once fire reached the fourth floor, the fire spread to combustible wall paneling in the corridor and into the combustible void space below the roof deck. Once in the void space the fire eventually caused partial collapse of the roof system, and fire spread into individual guest rooms.

Some of the guests became aware of the fire by the activation of their individual room detectors while others were aroused by guests knocking on guest room doors and by sounds from the fire apparatus. Since the third floor corridor was soon charged with smoke, most of these guests went to windows and waited to be rescued. The self-closing guest room doors appear to have provided an effective fire barrier for the trapped guests until they could be assisted by fire fighters. It appears that tenable conditions existed for a longer period of time in the fourth floor exit access corridor since many guests reported using interior stairs to escape.

Due to the origin of the fire in the exit access corridor and fire spread over combustible interior finish and through the unprotected laundry chute, a severe life safety threat faced the hotel guests. The fire detection and alarm system was out of service and the guests were not alerted promptly since the desk clerk deactivated the system. It apparently did function properly to detect the earlier trash can fire. Apparently, the facility did not have an



evacuation plan that included actions of employees during a fire emergency and notification of the fire department.

It is fortunate that more lives were not lost in this incident. This can be attributed to the fire barriers provided by guest room doors to allow time for rescue by fire fighters, access to the building from the outside, and effective rescue and fire fighting efforts. The operable windows allowed trapped guests to clear smoke from their rooms. Finally, the individual guest room detectors were effective in alerting some guests to the fire conditions.

A severe fire developed in this non-sprinklered hotel. (The partial sprinkler system in the basement was remote from this fire and it was not a factor.) The life safety record in such facilities protected by complete automatic sprinkler systems is excellent. An automatic sprinkler system could have extinguished the fire as well as provide an alarm for notification of hotel management and guest. Automatic notification of the fire department would have allowed the fire department to respond to the hotel and to assist guest and hotel management.

The following are considered to be major factors contributing to the loss of life and injury in this incident:

- The location of the area of origin in the exit access corridor and lack of automatic extinguishment in the incipient stage;
- The presence of highly combustible interior finish materials in the exit access corridor;
- Rapid spread of the fire to the fourth-floor through an unprotected vertical opening;
- The deactivation of the hotel's automatic fire detection and alarm system;
- The lack of prompt notification of the fire department.

The Travel Master Inn Motel fire is similar,<sup>1,2,3</sup> in many respects, to multi-fatality hotel fires recently investigated by the NFPA. The loss of life in this fire, however, was limited to one person. There are several positive factors which are thought to have limited the number of fatalities and injuries:

- 1) the activation of individual guest room smoke detectors to alert guests;
- 2) the ability of guests to remove smoke from guest rooms and to notify fire fighters of their location via guest room windows;
- 3) the effective fire barrier provided by the self-closing guest room doors;
- 4) effective fire fighter rescue of trapped occupants.

The fire protection features involved in several of these positive factors were provided as a result of state and local fire officials upgrading the level of fire protection in existing hotels in the state through the enforcement of existing fire and building codes.

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<sup>1</sup>David P. Demers, "Ten Die in Greece, NY Hotel Fire", Fire Journal, 73, Vol. No. 4 (July, 1979), p.25.

<sup>2</sup>Idem, "Familiar Problems Cause 10 Deaths in Hotel Fire", Fire Journal, Vol. 74, No. 1 (January, 1980), p.52.

<sup>3</sup>Thomas J. Klem, et al, "Five Die in Texas Ramada Inn Fire", Fire Journal Vol. 78, No. 2 (March, 1984), p.55.

