Summary Investigation Report

Silver Leaves Group Home Fire
Eau Claire, Wisconsin
February 7, 1983

Prepared by

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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). It was jointly funded by these agencies and the NFPA.

INTRODUCTION

The National Fire Protection Association (NFPA) investigated the Silver Leaves Group Home 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 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 agreement, funded by all three organizations, provides for the investigation of technically significant fires by the NFPA Fire Investigations and Applied Research Division to document and analyze incident details and report lessons learned for loss prevention purposes.

The NFPA became aware of the Silver Leaves Group Care Home fire on February 8, 1983. Thomas J. Klem, Director, Fire Investigations and Applied Research Division, traveled to Eau Claire, Wisconsin to document the facts related to this fire. A two 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 Eau Claire Fire Department. This report presents the findings of the NFPA data collection and analysis effort.

This report is another of NFPA's studies of fires having particularly important educational and/or technical interest. The information presented is based on the best data available immediately after the fire incident and that obtained during 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 Silver Leaves Group Home.

The cooperation of Fire Chief Kenneth E. Mikesell, Deputy Chief John R. Brown and Fire Inspectors William Schulte and Dale Stotesbury is greatly appreciated.

The assistance of Mr. Harold Nelson, Center for Fire Research, National Bureau of Standards, is acknowledged.

Abstract

An early morning fire in a community-based residential facility resulted in six elderly residents losing their lives. The fire occurred on Monday, February 7, 1983, in Eau Claire, Wisconsin, a small college community 85 miles southeast of the Minneapolis - St. Paul area. The building was a 102-year old Victorian-style, three-story frame dwelling which had recently been converted from a single family structure to a boarding home. The facility provided care for eleven elderly residents occupying rooms on the first and second floors. All eleven residents were reported to be ambulatory and capable of self-preservation under emergency conditions. Two students were available to attend to residents' needs during the evening hours.

The facility was licensed by the State of Wisconsin, Department of Health and Social Services as a "Community-Based Residential Facility". Frequent inspections of the facility were conducted by members of the Eau Claire Fire Department. Protection for the facility was provided by several single-station, battery operated smoke detectors located within exit access corridors and within residents' rooms. A combination rate-of-rise, fixed temperature detector system was provided in the basement area only. The building contained two stairways for evacuation purposes. The building was not equipped with a manual fire alarm system or an automatic sprinkler system.

The fire was reported to the Eau Claire Emergency Communication Center by a neighbor returning home. The fire at the time of discovery was showing from the first floor living room window and advancing throughout the building. Police officers in the immediate area arrived on the fire scene

and reported several unsuccessful attempts to gain entry to the building to rescue occupants. First arriving fire appartus reported fire throughout most of the first floor level and heavy smoke emitting from the second floor windows. There were no abnormal delays in extinguishing the fire. During search and rescue efforts, six fatalities were located by fire department personnel.

Contributing factors to loss of life in this incident include:

- Failure to detect and extinguish the fire before the critical level* was reached within the building.
- Unprotected stairway provided a vertical opening through which products of combustion were able to spread to the second floor.
- Delay in initiating evacuation of occupants and notifying the fire department once the smoke detectors activated.

BACKGROUND

The Silver Leaves Group Home was a 102 year-old Victorian-style building. The three-story structure with full basement, approximately 50 ft. by 30 ft., was of wood-frame construction. At the time of the fire the building housed eleven elderly occupants and a night staff of two persons. The occupants and night staff were provided rooms on the first and second floor levels only. The third floor of the building was unoccupied but was used for general storage. Wall and ceiling finish materials were mostly wood lath and plaster.

The building was once a large single-family residence that had recently been converted to an occupancy designed to provide sleeping accommodations for up to 15 people. The Wisconsin Administrative Code classifies such an occupancy as a Community-Based Residential Facility. Such facilities provide

* Critical level is the point in the development of a fire when deterioration of the environment represents danger to life. For further details see NFPA, Fire Protection Handbook, 15th Edition, Section 6, Chapter 1.

care, treatment and services to 9 through 20 unrelated adults. The Administrative Code requires that all residents be ambulatory, capable of following directions and taking independent action for self-perservation under emergency conditions.*

The first floor of the Silver Leaves Group Home contained three bedrooms, a kitchen, a bathroom, and a living room area (see Figure 1). The second floor contained five bedrooms, bath facilities, and a dayroom. The basement of the building held recreational and laundry facilities for occupant use.

Exiting for the first floor was provided through the front entrance foyer to the outside of the building. A rear kitchen exit was also provided on the north side of the building. Exiting for the second floor was provided by two stairways. The northwest stairway was enclosed and discharged directly to the outside of the building without any openings to the first floor area. The northeast stairway communicated directly with the first floor and basement area. A wood-panel door with self-closer was provided at the second floor landing area. The door would not have met enclosure requirements for stairways. A wood-panel door with closer was also provided at the first-floor landing of the basement stairway.

Individual bedrooms were provided with single-station, battery-operated smoke detectors. In addition, single-station, battery-operated smoke detectors were placed at the base and at the top of each of the building's stairways. Smoke detectors were not interconnected for multiple station alarming in the event of activation of one device. The basement area of the building was protected by combination rate-of-rise, fixed temperature

* This occupancy, like many of the estimated 300,000 homes throughout the Country, provided sheltered care to its occupants. Boarding homes are quite often located within a residential section of a community, typically in a large converted single-family dwelling where room and board are provided. Typically, occupants of the boarding home are elderly and/or may have some physical or mental handicap. Occupants are provided a protected living arrangement with some personal care services. Occupants of boarding homes usually cannot live independently because of their social and economic situation yet they do not require 24-hour institutional or nursing care. For further discussion see Fire Safety in Boarding Homes, NFPA SPP-76, Quincy, MA, 1981.

detectors. Wood panel doors on occupant rooms were not provided with self-closing devices. There were multi-purpose, dry chemical type fire extinguishers provided on each occupied floor level of the building. The building was not equipped with an automatic sprinkler system nor was it equipped with a manual fire alarm system for occupant notification in the event of fire.

The Silver Leaves Group Home was described by the Eau Claire Fire Prevention Division as being in conformance with the Department of Health and Social Services requirements for a community-based residential facility. Frequent inspections were made by fire prevention officers to insure conformance with the Code.

An evacuation plan was developed for the Silver Leaves Home by members of the Eau Clair Fire Department Inspection Bureau. The plan was posted in the kitchen area. It was reported that the staff had discussed the fire evacuation procedures with occupants several times; however, no evacuation drills were ever practiced.

Weather at the time of the incident was reported to be clear, 10°F. The ground was snow covered; however, roads were clear and passable.

FIRE INCIDENT

The Eau Claire Emergency Center was first notified of a structure fire at 715 Third Avenue at 11:49 p.m. Investigators later determined that the call came from the next door neighbor who, while approaching his home, observed fire in the living room area of the Silver Leaves home extending from the windows to the second-floor area. The neighbor entered his home and telephoned the Emergency Center. The Emergency Dispatch Center alerted police and fire units who responded to the scene. The fire department responded to the fire with three engines and a ladder company.

A police cruiser was reported to be on the scene within seconds of dispatch. The officer described the fire as extending from the living room

windows and the entire building filling with smoke. Several other police officers soon arrived; all made several attempts to gain entry, but were driven back by the intense heat and smoke conditions. During these attempts, officers reported coming in contact with several of the occupants and the two attendants who were evacuating the building by way of the northwest stairway.

Fire apparatus arrived on the scene and prepared to attack the fire. One and one-half inch hose lines were advanced by the first arriving engine company to the first-floor living room area. Subsequent arriving fire fighters began ventilation, search and rescue efforts, and assisted in the extinguishment of the fire. The fire department officers reported knock-down of the fire within minutes of their arrival. Fire fighters searching the building located six fatalities; three victims were located on each of the first and second floor levels (see Figures 1 and 2).

Investigators from the Eau Claire Fire Department have listed the cause of the fire as undetermined. The most likely ignition scenario is believed to be, however, a cigarette that ignited ordinary combustible materials within a plastic trash container in the living room area.

Investigators believe that once ignition took place in the trash container, the fire spread to an adjoining sofa and window drapery material. The fire then continued to grow and spread to other furnishings within the living room including two other sofas, upholstered chairs, and the carpet and under-layment material. At least one of the sofas was believed to contain polyurethane foam as a padding material.

At some point in the development and growth of the fire the single-station, battery operated smoke detector located at the base of the northwest stairway began to alarm. Several of the residents were awakened by

the alarm and were able to safely evacuate the building. The alarm signal also was able to awaken one of the two night attendants who was asleep in the second-floor front bedroom (furthest bedroom from the sounding detector). The attendant attempted to arouse the other attendant and then began to search for the source of the alarm. Reaching the first-floor kitchen area, the attendant observed a "red glow" in the area of the couch and trash container. She later described to investigators that she also felt heat on her face (approximately 15 feet from the point of origin). She searched for a telephone but remembered it had been taken to the attendants' room earlier in the evening. At some time during the fire discovery she was met by an occupant. Both discussed the fire briefly. She then told the occupant to evacuate the building.* Returning to her bedroom, she began awakening second-floor residents and the other attendant who apparently fell back to sleep. A telephone call was then made to the owner of the property to alert them of the fire. The owners telephoned directly to the main fire station rather than the Emergency Communications Center. Fire fighters were in the process of responding when the call was received at the station.

Both attendants continued their efforts to evacuate second-floor residents. Tenable conditions on the second floor from the time of discovery to this point diminished quickly. Smoke conditions were reported to have almost totally obstructed the attendants' view. An unsuccessful attempt was made by one of the attendants to descend the northeast stairway to evacuate residents. The attendants and four residents were barely able to escape down the enclosed northwest stairway and were assisted from the building (presumably by police officers).

The fire caused extensive damage to the first-floor living room area.

* Subsequent interviews with the occupant revealed that he responded to prior evacuation instructions given to him during a routine inspection of the facility by a member of the Eau Clair Fire Department's Inspection Bureau.

Heat and smoke damage varied in the bedroom areas throughout the building depending in part on the position of occupants' room doors. For example, an adjacent bedroom to the area of origin experienced little heat damage and moderate smoke damage. This room was determined to have its door closed throughout the incident. The occupant of this room survived the fire. However, smoke damage was extensive in the southeast bedroom where two fatalities were found with the bedroom door open. Fire damage to the second floor was limited to an area adjacent to the northeast stairway. The second floor showed evidence of heavy deposits of soot on walls, ceilings and on room furnishings. Heat damage was noted in second floor bedrooms where low melting-point materials were present.

ANALYSIS

Once ignition took place in the living room area of the Silver Leaves Home, the fire was able to develop quickly and spread to other combustible room furnishings. The original materials involved; i.e., draperies, sofas, and upholstered chairs, presented a substantial fuel load. It is quite likely that many of these materials were involved before occupants responded to the smoke-detector alarm or shortly thereafter. Several factors may have contributed to this build-up of fire within the living room or are indicative of the magnitude of the fire at discovery. First, the 9-ft. living room ceiling height would have enabled smoke to layer to approximately 6 ft. 8 in. (height of door opening) before significant migration of smoke moved to the smoke detector adjacent to the northeast stairway. Next, the fire was able to singe the hair of one of the occupants and was felt on the face of the attendant, both positioned at a distance of approximately 15 ft. from the area of origin. Finally, since the smoke detectors were not arranged for multiple-station alarming, it is likely that the alarm may not have been able to immediately arouse the attendants due to limited audibility.

During the time it took the attendant to return to her second-floor room, awake the other attendant, telephone the owner, and begin evacuation of second-floor occupants, the living room area became fully involved in fire. Living room windows failed and superheated products of combustion entered the unenclosed northeast stairway and quickly began to fill the second-floor area. It was about at this time during the fire development that the fire was observed by the next-door neighbor returning home.

Earlier discovery of the fire by occupants would no doubt have improved the chances of survival of all of the occupants of the home. Because the living room area was a designated smoking area and since it presented a substantial fuel load, automatic detection and/or suppression equipment should have been considered for the area. Further, typical ignition scenarios of boarding home fires investigated by NFPA have originated in group areas (i.e., living room, TV and/or recreation areas). Smoke detection equipment, if provided for this protection, should be arranged to alert occupants in all locations over background noise and with all doors closed. Multiple alarm activation would likely have provided acceptable levels of audibility in all parts of the building. The living room of the building connected directly with an unprotected vertical opening. As a result, automatic sprinklers would have been required throughout the structure by Chapter 20 of the 1981 Edition of NFPA 101, the Life Safety Code*. A complete automatic sprinkler system could have extinguished the fire as well as provide an alarm for notification of residents.

Valuable time was lost in the notification of other occupants and the fire department in this fire. Due to heat and smoke conditions, attendants were

* The 1981 Edition of the Code was not in effect in the City of Eau Clair at the time of the fire; however, for analysis purposes it is useful to compare life safety problems exemplified by this incident with current national consensus standards.

unable to return to the first floor to assist in evacuation of occupants. A manual fire alarm system could have been provided a means of alerting occupants through out the building and could have been arranged to automatically transmit an alarm directly to the fire department. The Code would have required a manual fire alarm system for the building.

An emergency evacuation plan that specified when to notify the fire department, to begin evacuation procedures, and that indicated secondary escape routes, etc. was posted within the building. This plan should have been known and understood by all occupants and fire drills practiced within the building at various times. Had this been done, it is possible that it could have aided evacuation and resulted in earlier notification of the fire department.

Smoke and heat spread quickly to the second floor through the northeast stairway because the wood panel door was blocked open throughout the fire. The door position was significant in reducing time needed for evacuation of second-floor occupants. Even though the door did not have adequate fire-resistant rating to meet stairway enclosure requirements of the Code, if closed, it may have allowed additional time or allowed occupants to be rescued by emergency personnel. Life safety problems created by unenclosed stairways in buildings has been well documented in past fire investigations conducted by the NFPA. Stairway enclosure is a fundamental fire protection requirement for occupancies such as the Silver Leaves Home.

Contributing factors to loss of life in this incident include:

- Failure to detect and extinguish the fire before the critical level was reached within the building.
- Unprotected stairway provided a vertical opening through which products of combustion were able to spread to the second floor.
- Delay in initiating evacuation of occupants and notifying the fire department once the smoke detectors activated.

The value of properly enclosed stairways is clearly illustrated in this fire. Had the northwest stairway not been enclosed, the casualties most likely would have been higher in this fire. The fire was well advanced throughout the building when the fire was discovered and evacuation was occurring. Any communication of the stairway to the first floor level (without adequate protection) would have resulted in untenable conditions within this escape route.

The value of closed occupant room doors was also evident in this fire. Even though these doors did not have a fire-resistance rating, they did provide a temporary barrier to the products of combustion. Their closed position may have given occupants more time to evacuate the building and/or given emergency personnel time to rescue occupants.

This fire represents another tragic loss of life in a boarding home occupancy [1, 2, 3, 4] Had the protection provisions contained in Chapter 20, "Lodging or Rooming Houses," of the Code been in effect and enforced in this building, the life loss would have been reduced. However, because of this unique type of occupancy and because of the unique characteristics of occupants of boarding homes, additional attention needs to be concentrated on this occupancy to have fire protection features/designs adequately reflect the capabilities (incapabilities) of its occupants.

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[1]Bell, James R. "Fourteen Die in Ohio Boarding Home Fire." Fire Journal, July 1980.

[2]Bell, James R. "24 Die in New Jersey Hotel Fire." Fire Journal, March 1981.

[3]Bell, James R. " Fire in Adult Foster Care Home Kills Five Residents." Fire Journal, September 1981.

[4]"Fire in Two Boarding Facilities Kill 34 Residents." Best, Richard L. and Hill, Steven W.; "Little Friends, Inc., Community Living Facility, Naperville, IL".

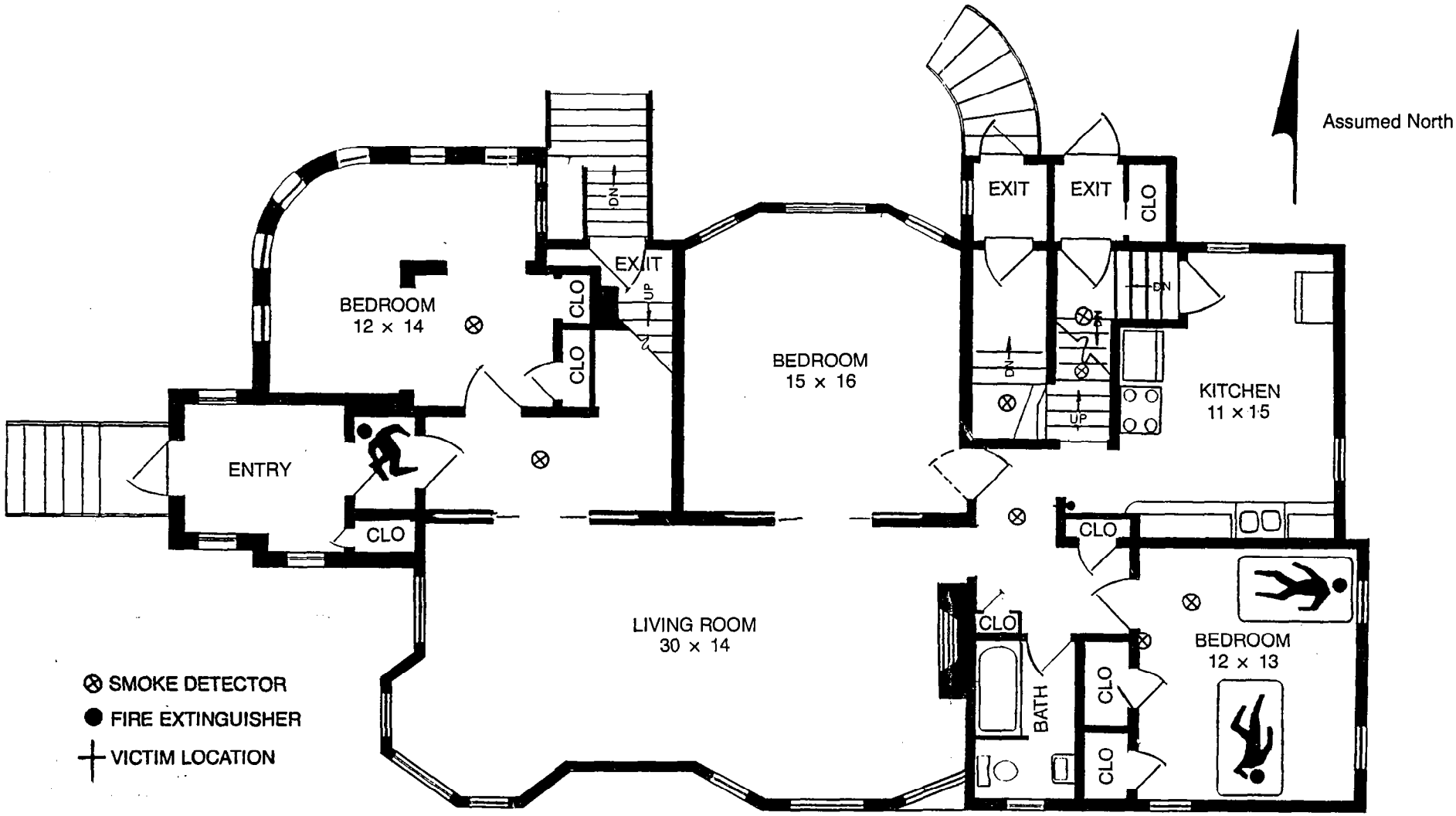

FIGURE 1. FIRST FLOOR

⊗ SMOKE DETECTOR

● FIRE EXTINGUISHER

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"Wisconsin Group Home Fire"
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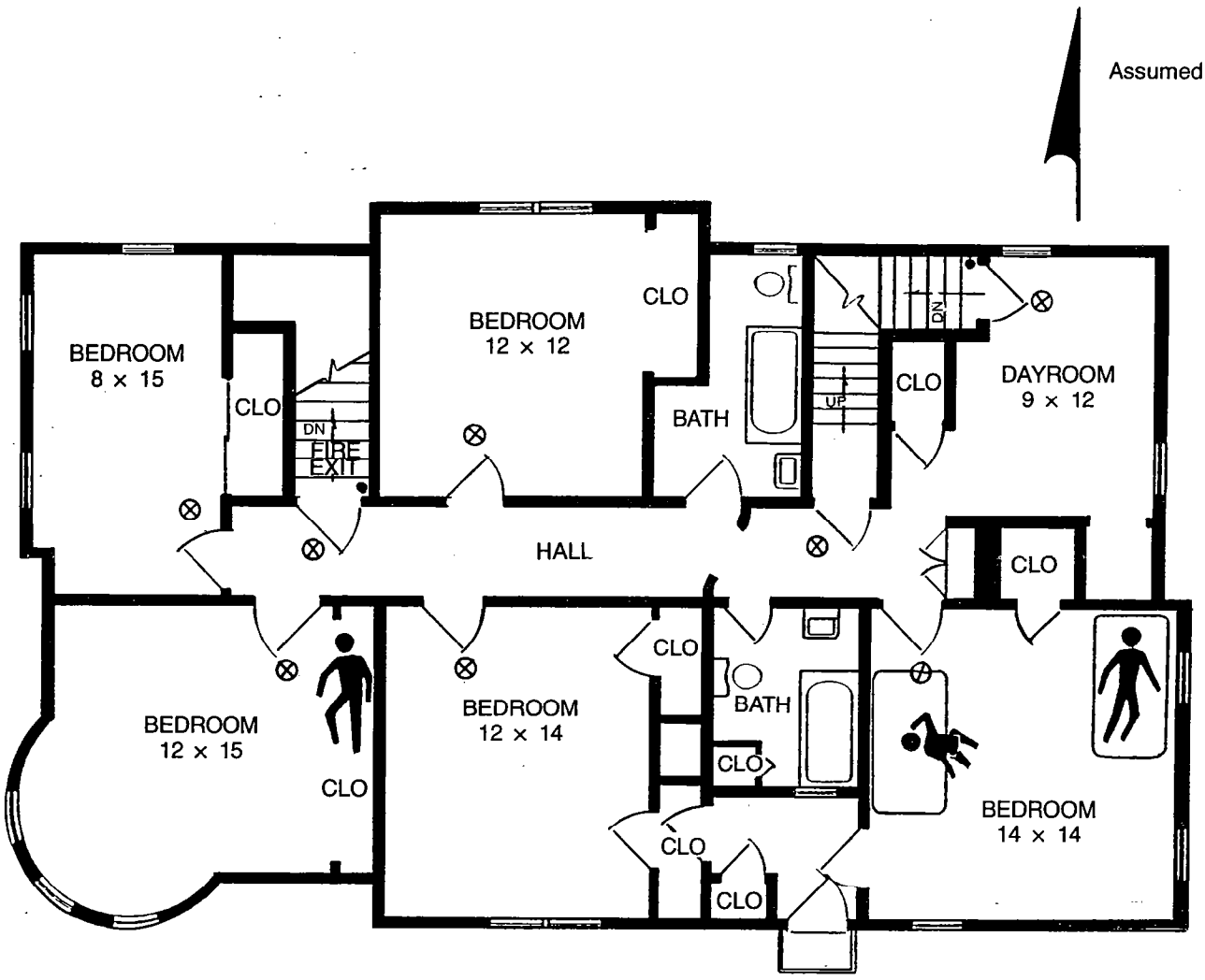

FIGURE 2: SECOND FLOOR

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Preliminary Report
Boarding Home for the Elderly
Eau Claire, Wisconsin
February 7, 1983
Six Fatalities

An early morning fire in a community-based residential facility (boarding home) resulted in six elderly residents losing their lives. The National Fire Protection Association (NFPA) dispatched an investigator to the fire scene to document and analyze significant factors resulting in the loss of life. An increase in the use of boarding homes to house many "deinstitutionalized" persons has been followed by an alarming number of fatal boarding home fires.* Most of the boarding home fires investigated by NFPA were conducted in cooperation with the Federal Emergency Agency/United States Fire Administration (FEMA/USFA) and the National Bureau of Standards (NBS) under a standing agreement with FEMA/USFA. This important cooperative effort between the government and NFPA have provided useful results for improving boarding home fire safety.

This latest fatal fire occurred on Monday evening, February 7, 1983, in Eau Claire, Wisconsin, a small college community 85 miles southeast of the Minneapolis - St. Paul area. The building was a 100-year old Victorian-style, 2 1/2-story frame dwelling which had recently been converted from a single family structure to a boarding home. The facility provided care for eleven elderly residents occupying rooms on the first and second floor. The basement of the building was used as a recreational and laundry room area by the occupants. The attic area of the building was unoccupied with limited furnishings.

The facility was licensed by the State of Wisconsin and frequent inspections (four per year) were required by members of the Eau Claire Fire Department. Protection for the facility was provided by several single-station, battery operated smoke detectors located throughout the building and within most residents' rooms. Further, there was an unenclosed stairway that was provided from the second floor for occupant

*See accompanying "Fire Safety in Boarding Homes", National Fire Protection Association, Quincy, MA, 1981.

was an additional open stairway located at the end of the second floor exit access corridor. The building was not equipped with a manual fire alarm system, however, combination rate-of-rise, fixed temperature detectors protected the basement area.

All eleven residents were reported to be ambulatory and appear not to have been on heavy medication. Two young students, who worked as night managers, were available to attend to residents' needs during the evening hours.

The cause of the fire is currently listed as undetermined by the Eau Claire Fire Department. The investigation is continuing but it is believed to have been an accidental ignition of furnishings. The fire was discovered when one of the night managers was awakened by a smoke detector operating on the first floor. Leaving her second floor room, and descending to the first floor, she observed a developing fire within the living room (lounge) portion of the building. At the time of discovery, the manager could see a "glow" in the area of a couch and feel the heat from the fire on her face. She returned to her second floor room to arouse the other night manager. A phone call was made to the owner of the facility and evacuation procedures were then initiated.

At the beginning of the second floor evacuation, smoke had already penetrated that floor by means of the unprotected, open stairway and was beginning to affect the occupants.

At about this time, a neighbor returned home and observed fire extending from the ground floor windows of the boarding home. At 11:49 p.m. the neighbor entered his home and called the fire department; apparatus was dispatched to the scene. A police officer in the area responded and reported on the scene within one minute of the alarm. The officer observed the second floor evacuation in progress and the fire extending from the first floor windows. The officer (and other arriving officers) made several unsuccessful attempts to gain entry into the building to rescue trapped occupants.

The fire was quickly extinguished by the Eau Claire Fire Department and was confined to the first floor living room area. Fire department personnel reported heavy smoke conditions throughout the building at the time of extinguishment. During rescue and extinguishment efforts, six bodies found and were removed from the building (three from each floor) by fire department personnel. Only one occupant was able to escape from the first floor.

Contributing factors to loss of life in this incident include the rapid spread of smoke and toxic combustion products to the second floor through the open stairway and the delay in initiating evacuation of occupants once the fire had been detected.