



AMERICAN HEAT
presents

Manufactured Housing

500-0191

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I. SYNOPSIS

Even with the significant advantages in fire safety that have been made over the years, fire deaths in manufactured homes still occur at a rate nearly twice the rate of fire deaths in other types of homes.

Department of Housing and Urban Development (HUD) standards promulgated in 1976 have had a measurable effect on improving the safety of manufactured housing with respect to fire. Nevertheless, manufactured housing still presents us with unique fire-fighting problems.

II. OBJECTIVES

Upon completion of this lesson:

1. The firefighter will be able to list factors that contribute to the increased risk of fire death in manufactured homes [NFPA 500: 3. ff.]
2. The firefighter will be able to describe fire-fighting considerations that are used in manufactured housing fires [NFPA 1001: 3-3.3, 3-3.9]
3. The firefighter will be able to list construction features and hazards of manufactured homes. [NFPA 1001: 3-3.11]

III. INTRODUCTION

"In 1999, 21.4 million Americans (about 7.6 percent of the U.S. population) reside full-time in 8.9 million manufactured homes."

(From Dr. Carol Meeks, Manufactured Home Life study, 1998.)

With such a significant percentage of persons living in manufactured homes on a permanent basis and even more who use them as accommodations for vacations or other temporary activities, the fire service finds itself in need of good information on fires in manufactured housing and their unique issues.

A discussion of manufactured housing generally requires some specificity in describing exactly which manufactured houses are being discussed. So many different types of manufactured houses exist today.

Most states recognized manufactured housing as a viable alternative to site-built housing. Many

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have specific laws which basically prevent discrimination between manufactured houses and other types of construction, particularly when the manufactured house has a permanent foundation, has had the means of mobility removed, and/or has a pitch roof.

Since so many different types of manufactured houses exist, we will confine most of our discussion to the type often referred to as "single-wide mobile home." A single-wide mobile home is roughly 14 feet wide and may be up to 80 feet in length. The single-wide, as envisioned here, is the image we typically have of the "mobile home" with a flat roof and elevation of the floor off the ground being achieved by the axles under the home.

IV. KEY POINTS

- A. While manufactured housing is generally no more likely to have a fire than a conventional site-built home, the risk of fatality is higher.
- B. Prevention of fire is the single most important aspect to life safety in manufactured housing.
- C. Because of reduced room sizes and extensive use of flammable wall materials, fire growth rate is enhanced in manufactured housing.
- D. Rescue activities should not be undertaken without sufficient resources
- E. Fire suppression activities may require more resources than a conventional residential structure.

V. OUTLINE

A. Construction Features

Mobile homes are constructed to be able to provide a comfortable living space while maintaining a small physical footprint. Further, the mobile home is designed to contain as many features of a larger, site-built home but with the added capability to allow some mobility of the entire structure.

1. Narrow hallways so that room space, especially bedrooms, can be maximized

The smaller rooms, as in any structure, can act to confine the fire and enhance fire growth much like an oven.

2. Walls that are covered with durable but flammable materials that can tolerate movement of the structure

The combination of smaller hallways and rooms and more combustible wall coverings may lead to early flashover in mobile home fires.

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3. Rigid duct work that is mounted on the underside of the structure

The centralized air handling in the mobile is often of the rigid rectangular cross-section extending the length of the unit. This could be a source of spread for fire due to heat conduction.

Electrical wiring is also routed through this area for ease of construction.

4. Limited Interior Storage Space

Limited space in smaller manufactured homes may encourage storage of materials in the closet that should be for the exclusive use of water heaters or central heating units. Combustibles should never be stored in these spaces and these spaces also provide a space for hidden fire when fires occur.

5. Restricted Mean of Egress

Older mobile homes, not built after the 1976 HUD requirements, may have only a single door for entrance and exit and the windows may not be easily used for egress.

6. Smoke Detectors

While manufactured homes are required to have two smoke detectors in many jurisdictions, the smoke detectors are often not functioning, primarily because they have not had the batteries replaced. The fact that these detectors are not operational can contribute to failure of occupants to be aware of the fire and to increase the risk of occupants being in the structure on arrival of the fire department.

7. Tie-Downs

Mobile homes are required in many jurisdictions to be tied down for wind and hurricane/tornado resistance. Mobile homes should be tied down as soon as possible after placement. These tie-downs also serve to reduce home movement that could contribute to damage of electrical wiring and gas lines.

B. Additional Hazards of Mobile Homes

1. Electrical wiring

Electrical wiring may be a contributing factor to fire ignition but can also pose a risk to firefighters during search and suppression operations

Electrical systems and heating fires are the leading causes of fire in manufactured homes.

2. Propane Tanks

For mobility, mobile homes may be supplied from a propane tank situated next to the structure or, in some cases, attached directly to the structure.

3. Open Space Under the Mobile Home

Another source of flammable fuels is the collection of debris under the home. Homes that will be in place for extended periods should have skirts to prevent debris from entering this space. This same space offers a path for fire spread and should be opened to check for extension. Skirting also reduces the ability of embers entering the space under the home and igniting that exposure.

One common electrical problem is fire started in heat tape that has been applied to pipes under the mobile home.

4. Resident-Use Fire Fighting Equipment in Mobile Home Parks

Although NFPA 501A lists as a recommendation in its appendix that fire fighting equipment be maintained on the premises of mobile home parks, that residents be apprised of the locations, and that the staff be trained in its use, this is not a requirement.

C. Fire Flow Calculations

When calculating fire flow, mobile homes should be considered at a higher hazard classification than conventional residential structures due to the smaller geometry of rooms and the flammability of wall materials. Consequently, first arriving crews should consider an immediate call for additional alarms or mutual aid or, better yet, have automatic additional alarms or mutual aid dispatched when the fire is reported in a mobile home.

Additional companies can always be disregarded if not required.

D. Rescue and Fire Attack Considerations

1. Entry Into Involved Structures

Entry should not be attempted unless you have control of the fire. Fire can spread rapidly in a mobile home and trap firefighters.

2. Site Plan and Hydrant Location

A key to fire suppression is being able to locate the fire. Too often, the involved mobile home cannot be found until its involvement is large enough to identify it. This is why it is critical that mobile home parks be required to keep the responding fire

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department updated on the layout and location of sites, hydrants, utility disconnects, and street and addressing numbers within the mobile home park.

3. Flashover

Due to the higher thermal output of materials, the small geometry, and the sealed nature of mobile homes, flashover is a very real consideration early in the fire. Crews should be very aware of this if entry is attempted. Firefighters have been severely burned opening the door of a mobile home that had little or no visible smoke or fire.

Interestingly, although not impossible, backdraft seems to be less of a consideration, at least for arriving fire crews, possibly because the heat generated by the fire tends to open up the structure as it reaches full development. In any event, fire crews should exercise due caution when opening windows or doors of fire-involved mobile homes.

4. Floor Failure

Because the fire can attack the floor of the structure in a confined, oven-like fashion, fire crews should be wary of entry unless the underside can be visualized and the floor, much like a roof, has been sounded. Firefighters have entered mobile home fires and gone through the floor and been wedged between the steel beams of the transportation carriage.

5. Area Under the Home

The area under the mobile home should be checked for fire extension and hidden fire. Under the home is also used as storage and may contain, amongst other things, spare propane bottles. The skirt should be removed carefully, wearing full protective clothing and using a pike pole or other similar tool

6. Tie Downs

Tie-downs may be an impediment to opening the skirting. They can also become energized as the fire exposes electrical lines. These tie-downs can be a tripping hazard.

7. Exposures

The close proximity of placement of mobile homes in mobile home parks creates a greater risk to exposures. Exposure protection should be considered early in the incident and additional crews called. Many departments automatically dispatch additional alarms when the fire is reported to be in a mobile home park.

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8. Rural Areas

a) Delayed Report

Mobile homes also are sited in rural locations with greater frequency than urban settings. This contributes to an increase in time elapsed prior to reporting of a fire, particularly if the structure is unoccupied.

b) Limited Water Supply

Rural areas can present a limited water supply problem. Even in non-rural settings, some older mobile home parks may not have adequate hydrants available and may require long supply line lays or shuttling.

VI. GLOSSARY

Single-wide: Describes a mobile home of up to 14 feet in width and up to 80 feet long

VII. REFERENCE LIST

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NFPA 1001, Standard for Firefighter Professional Qualifications, 1997 Edition, National Fire Protection Association, 1 Batterymarch Park Quincy, MA.

Brannigan, F: Building Construction for the Fire Service, Third Edition. National Fire Protection Association, Batterymarch Park, Quincy, MA, 1992: pp. 17

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VIII. CHECK SHEETS

There are no check sheets with this lesson