	Terryville Fire Department **Best Practices**	
	Subject **Private Dwelling Fires**	BP# 3-03 Initiated 7/1/2015
	Authority **Chief of Department**	Revised 9/16/2015

A. PURPOSE

1. Private Dwelling Fires challenge the expertise of firefighting forces and require a coordinated team operation. Seventy percent of all fire deaths occur in private dwellings. The following best practices are for an assumed light to medium fire situation in a peaked roof private dwelling with one or more rooms involved.

B. GENERAL GUIDELINES / CONSIDERATIONS

1. Crowding of stairs may be become a major problem. Stairs must be kept clear. The number of firefighters inside the fire building should be kept to a minimum.

2. All members shall comply with the Respiratory Standards (BP# 1-06) along with all other safety related best practices.

3. If a known life hazard is found and immediate action could prevent the loss of life, appropriate action (rescue activity) may be taken by the individual member. This applies only for a known life hazard, not for standard search and rescue activity. If such action is taken, the Incident Commander (IC) must be notified immediately and appropriate adjustments made.

4. Peaked roofs are designated according to construction features including mansard, gable, hip, shed, or gambrel types. Roof coverings may be asphalt, asphalt roll roofing, asbestos shingles, slate or Spanish tile. Flat roofs or roofs of low pitch may have a scuttle and/or skylight.

5. Two entrances are most common. The main entrance is located in the front and a secondary entrance is located on the side or rear. In structures with more than one story, the interior stairs to the basement will usually be located under the main stairs. With semi-attached structures or those with minimal space on one side, the inside cellar stairs will usually be found near the side or rear entrance.

6. Complicating fire operations, units should expect obstacles such as hilly terrain, set backs, overhead wires, fences, tress, shrubbery, diverse architectural features and numerous floor plans. Dwellings built on sloped terrain can cause communication and operational problems. A dwelling which has 1 or 2 stories in the front may be 2 or 3 stories in the rear. Coordination between members operating inside and outside is necessary.

C. SPECIAL CONSIDERATIONS

1. Basement areas used as living quarters with no secondary means of egress.

2. Basement areas may have an unfinished cellar ceiling. Open joist construction combined with heavy fire and an overloaded first floor, may cause an early collapse of the first floor. This can either be a local or a complete collapse.

3. Lack of a secondary means of egress from upper floors. Interior stairs are often narrow and sometimes winding. Landings are small; thus restricting movement of the operating forces and making an interior attack more difficult. Control and management of the interior stairs is critical to a successful operation.

4. In some dwellings, the stairs to the attic or third floor are found behind a small door resembling a closet door. In other homes, access to the attic is through a pull down type stairs with a rope attached for ease of use. Access may also be found in a bedroom closet with no ladder provided.

5. When it is obvious that the dwelling has two or more families (separate entrances, multiple mailboxes or doorbells, etc.) bedrooms can be found on all floors.

6. Attached and built-in garages may have a door that opens directly into the house which can be avenues for fire extension. Storage of automobiles, flammable liquids, propane and lawn or pool chemicals may be found. Some attached garages may also be converted to living spaces.

7. Alterations and repairs using sub-standard materials or faulty workmanship.

8. Fires involving the electrical service may energize aluminum siding. A ground is completed when an aluminum ladder is placed against or a firefighter makes contact with the siding.

9. Thoroughly examine areas under windows (especially when found open), and porch roofs, as victims may have jumped prior to the arrival of units. These victims may be easily overlooked if trees or shrubs surround the house.

10. Central air conditioning systems may spread smoke and toxic gases throughout the building. Dual heat and air-conditioning units will be in operation throughout the year.

D. SIZE-UP

1. Size-up begins when the alarm is received and continues until the fire is under control. It is an ongoing process that may require modification as operations progress.

2. Alarm Source

    a. How was the alarm reported?

    b. Direct calls may be more accurate than alarm company information

c. Attempt to locate occupant(s) upon arrival to aid in additional information such as the fire location, how long it's been burning, best access points, safety hazards, etc.

3. Time of Day

    a. Expect a greater number of sleeping occupants at night.

    b. Expect reduced manpower during weekday / daytime calls.

4. Type of Occupancy

    a. Dwellings can be one family, two families, or Single Room Occupancy (SRO). Be prepared for locked interior doors.

    b. Some private dwellings originally built as one or two family dwellings may be occupied by several families. Possible indications of more than one family may: two or more electric meters, several mailboxes, several satellite dish receivers, fire escapes, two front doors, numerous cars in driveway, exterior basement entrance, and /or garage doors removed and replaced with a normal entrance door.

    c. Possible indications of attic occupancy may be: attic area with a dormer, adequate height, air conditioner at attic level, and/or windows of fair size and normal appearance with curtains or drapes.

    d. Possible indications of occupied sheds with life hazards may be extension cords or hoses from house to shed.

5. Life Hazard

    a. A rapid build-up of heat and smoke in the confined areas of a private dwelling aided by the normally open interior stairs is an extreme threat to the occupants. A coordinated effort by the inside team and outside team to search for and remove all endangered occupants is required.

6. Construction

    a. Main entrance is usually located in the front. Secondary entrances can be located at the side and/or rear.

    b. Platform frame construction limits fire extension.

    c. Balloon frame construction lacks fire stopping between floors on exterior walls, allowing for rapid fire extension, which may be indicated by upper and lower windows in a direct line with each other.

    d. Combustible exterior walls may contribute to auto exposure.

    e. Wood truss, wood I-beams and C-joists exposed to fire may lead to early failure and collapse.

f. Basement ceilings with open joist construction increase the potential for the rapid spread of heat, smoke, and fire.

7. Windows

   a. All ventilation of windows must be coordinated with members operating inside.

   b. Window spacing may be an indication of room locations

   c. Porch and garage roofs may provide a suitable platform from which to work. Windows at these locations will allow quick access to the upper floor rooms. Be aware that screened or open porches may not provide protection from the fire venting below.

   d. Windows with sills that are approximately chest high may require a drop of 5-6 feet to floor level. This presents a serious problem if fire conditions force members to exit via this window. Upon entering, consider placing a chair or other piece of furniture below this window to assist in egress.

   e. Unconventional locking devices added for security reasons have complicated the problem of opening windows from the inside.

8. Roof Design

   a. Outside truck company positions are predicated on whether the roof is flat or peaked. When feasible, peaked roof operations should be conducted from the tower ladder bucket or aerial device.

9. Street Conditions

   a. Overhead wires, trees, narrow streets, flag lots, etc. may interfere with ladder apparatus placement.

D. BASEMENT FIRES

1. Many fires in private dwellings originate in the basement where the following may be a source of origin:

   a. Gas/oil fed boilers for heat or hot water

   b. Electrical service panels

   c. Kitchen stoves in basement apartments

   d. Clothes driers

2. Basements that are used for living quarters may contain large amounts of combustible household items, contributing to a large fire load. Some possible indications of a cellar fire are:

a. Fire or smoke venting from a basement window

b. Smoke pushing from the chimney (especially during warm weather)

c. High heat and heavy smoke with no visible fire on first floor

d. Very hot floorboards on the 1st floor

e. Smoke from attic windows (balloon frame construction)

3. Basement fires in dwellings with balloon construction may extend to the attic via hidden voids. Units operating above the basement must stretch enough hoseline to reach the upper floors. Intermediate floors must be checked for fire before a line is committed to the top floor.

4. Most dwellings usually have one interior means of access to the basement. These stairs must be kept clear and accessible at all times. Members shall not enter the basement unless specifically assigned.

5. The status of the interior basement door (open, closed, burned, unable to locate) is a critical factor that should be relayed to the IC. Door construction can be a critical factor in preventing or slowing fire extension. Members operating on the first floor above a basement fire MUST be aware that they are operating in a very dangerous area.

6. The IC should consider ordering an exterior hoseline to be operated into a basement window to allow for fast water operation or a quick knockdown when there may be a delay in applying water from the interior. Some examples of an delay in interior operations may be:

    a. Unable to gain entry to or advance the hoseline to the basement

    b. Unable to locate the basement entrance

    c. A serious or advance cellar fire.

    The IC should also consider ordering the hoseline to enter the basement from an exterior stairs, if available. An additional hoseline should be deployed to protect the first floor by the interior stairs.

    These actions can only be attempted when no members are operating in the basement and must be fully coordinated and communicated to all units operating at the scene. Members operating on the floor above should close the interior basement door to keep conditions tenable.

    The following options should be considered for safety, based on conditions.

    a. Operate under the protection of a charged hoseline on the floor above.

b. Secure an area of refuge, ensuring a ready means of egress

c. Exiting the building

E. EXPOSURE PROTECTION

1. Fire "lapping" out of a window, or burning on the exterior of a building, presents a serious exposure problem.

2. Openings in the underside of eaves (vent openings, etc.) or deteriorated siding may allow for fire extension to the attic of an exposure or the original fire building.

3. Units operating a hoseline to extinguish a fire on the exterior of a building should sweep the stream across the face of the building, starting at the top, so the water cascades down the exterior. Do not operate the stream directly into the windows.

    a. Consider stretching a 2 ½" hoseline if increased volume or reach of the stream is necessary.

F. FULLY INVOLVED DWELLINGS

1. Consider stretching a 2 ½" hoseline for faster knock down, greater reach of stream, increased volume of water and increased exposure protection.

2. Operate the hoseline on the exterior to protect exposures before entering building.

    a. Buildings fully involved have an increased collapse potential and require a complete evaluation by the IC before entering

3. Wood frame buildings that initially appear fully involved may only have their exterior siding burning.

G. ENGINE COMPANY OPERATIONS

1. These practices are based on the need for one or two handlines. Due to the combustible nature of both interior and exterior building materials, fire can spread rapidly. The unprotected, open stairwell to the upper floors as a natural flue for fire spread. Small rooms and narrow stairs are commonly found in dwellings. Due to the need for speed and mobility, a 1 ¾" hoseline will be used unless otherwise instructed.

2. All responding engines should be familiar with hydrant locations.

3. If the first arriving engine is instructed to reverse lay to the hydrant, they should consider dropping two handlines in front of the building.

4. Based on size-up and fire load, the first arriving engine may be instructed to bypass the hydrant and begin their fire attack using tank water. In these instances, additional arriving engines shall take a position at the closest hydrant and be prepared to lay in a supply line to the working engine.

5. Sufficient hoseline must be stretched to cover the anticipated fire area. The engine officer should make the determination on which hoseline to pull. Members shall spread out on the hoseline at the dwelling entrance to provide for efficient advancement.

6. The primary consideration for the placement of the first hoseline is to the exterior area of the dwelling by the fire area for a fast water attack. This will enable a quick knockdown of the fire while at the same time, drastically improving conditions within the building. After a quick knock down, the hoseline should then be relocated inside to extinguish the fire. If a second hoseline has already been pulled, the first hoseline may be used as a backup line.

7. When there is no access to the fire from the exterior, the primary consideration of the hoseline is through the front door for the protection of both the interior stairs and the members conducting searched above the fire.

8. The engine officer shall advise via portable radio when the hoseline attack is to commence in addition to updates such as water on the fire, fire knocked down, etc. Conditions in areas behind, adjoining or above the operating hoseline must be monitored. All members must be alert to fireground communications concerning hoseline placement and the commencement of hoseline operations so they may adjust accordingly.

9. General Assignments (Basement Fires)

    a. First hoseline stretched through main entrance to top of interior stairs. Again, the IC should consider a fast water attack from the exterior if possible before moving in.

        i. First line should not advance down the interior stairs unless the fire and stairway conditions permit for the rapid and safe decent of the line.

        ii. When there is an exterior basement entrance and the first hoseline does not advance, then the first hoseline will maintain a position on the first floor to protect the interior stairs, protect members conducting searches on the floors above and extinguish any fire that may be extending from the basement.

        iii. Control of the interior door is critical! The door should be maintained closed when an exterior entrance is used for attack. The first hoseline will remain on the first floor until the basement fire is controlled.

        iv. When there is no other hoseline available and there is a delay in gaining access or applying water to the basement through the interior, the IC may consider repositioning the first hoseline from the first floor into the basement from the exterior entrance.

b. Second hoseline will initially position outside the fire building as a back-up for the first hoseline. When not needed to back-up the first hoseline, it can be used to extinguish any fire that may extend to the floors above or positioned as per the IC.

    i. When the first hoseline does not advance down the interior stairs, or no interior access to basement exists, then the second hoseline can be directed by the IC to enter the basement via an exterior entrance if present OR apply water into basement window for a quick knockdown if there is a heavy fire condition or entry is delayed.

c. Third hoseline may be stretched, charged and positioned as ordered by the IC.

10. General Assignments (1st Floor Fires)

    a. First hoseline to apply fast water via exterior if possible and then relocate through front door to extinguish fire.

    b. Second hoseline initially positioned and charged outside the fire building as a back-up for the first hoseline. If not needed as a back-up, it can be used to extinguish any fire extending to other floors or exposures.

    c. Third hoseline may be stretched, charged and positioned as ordered by the IC.

11. General Assignments (Upper Floor Fires)

    a. First hoseline to apply fast water via exterior if possible and then stretch through main entrance and up the interior stairs to the fire floor to extinguish the fire.

        i. When there is no access to the upper floors by way of the main entrance, locate and stretch via the stairway that provides access to the fire area.

    b. Second hoseline initially positioned and charged outside the fire building as a back-up for the first hoseline. If not needed as a back-up, it can be used to extinguish any fire discovered in the basement or extending to other floors or exposures.

    c. Third hoseline may be stretched, charged and positioned as ordered by the IC.

H. TRUCK COMPANY OPERATIONS

1. Ventilation

    a. Today's fires are becoming ventilation limited, which at times occurs before the first companies arrive. Therefore, when we force entry, a window fails, or air is introduced into the structure, we see a rapid acceleration of energy and heat. During many scientific tests, it was found that time of ventilation to untenable conditions in a one-story home was 1 minute, 40 seconds and in a two-story home it was 3 minutes, 20

seconds. Both scenarios should be utilized as an order of magnitude as times can be shorter or longer based off different circumstances. Remember, *ventilation* is any action that allows smoke out and air into the structure. When air is allowed in or out of a structure, we are feeding the flow path and increasing the energy to the fire. Under all circumstances, it is important that members "control the door" and limit unnecessary ventilation.

b. There shall be no venting indiscriminately before the fire is being controlled as this could create untenable conditions, forcing the attack crew out of the building. This is especially dangerous if you vent behind the line lighting up the entire hallway. Smoke is fuel.

c. VENTING FOR LIFE – Accomplished to facilitate movement of members into an area where there is a known or suspected life hazard. With an inherent calculated risk of eventually "pulling fire" toward the ventilation area, it is performed only as part of an attempt to reach possible survivors.

d. VENTING FOR FIRE – Accomplished to facilitate the engine company advance to and extinguishment of the fire. This venting should be delayed until the engine company has water and is moving in on the fire.

2. Search & Rescue

a. Immediately upon entering the room from a window, if smoke is pushing in from the interior hall, members should make a quick check/sweep of the floor in the hall outside the door for potential victims before closing the door. Once this door has been closed, a more detailed search may be permitted. The completely removed window will adequately vent the room and the potential of pulling fire toward the vented room will be minimized by the closed door.

b. When the search of the room has been completed, the door can be opened carefully. This may assist in overall interior ventilation. In the event that fire may be pulled to towards room, the door shall be left closed.

c. If more than one occupant is found on an upper floor, the IC shall ensure that adequate staffing is assigned to effect their removal. The primary function of the engine crew during this critical period should be to protect the interior stairs.

3. Fire Extension

a. Many of the older and larger 2-3 story peaked roof private dwellings are built with balloon frame construction. A quick determination as to whether a structure is balloon frame is to remove a baseboard on an exterior wall and check for the presence of a sole plate. If none is found, treat as balloon frame. Additionally, if upper and lower floor windows are aligned, it may be an indicator of balloon frame. High heat accompanied by heavy smoke with no visible fire is a sign of fire burning in these hidden spaces. Advanced fire in these voids may cause the ceiling to be blown down on members pulling ceilings on the top floor.

b. A major concern in all fires is knowing where the fire originated. This is particularly important in balloon frame construction due to the continuous nature of the exterior wall studding. In this type of construction, fires originating in the basement can easily extend to the attic via the exterior wall channels created by this continuous studding. This type of concealed fire extension will commonly extend to the attic space while bypassing intermediate floors. Fire may also extend to lower floors via drop downs such as HVAC vents.

c. In platform construction the exterior wall studs extend only from the floor to the ceiling of each individual floor. They are capped at the ceiling level of each floor with a horizontal 2"x4" called a top plate. This construction feature acts effectively as a fire stop and limits or restricts vertical extension via the exterior walls.

d. Rapid fire spread via an open stairway should be a concern for firefighters operating on upper floors.

e. The chimney could have been the original source of the fire with heat transmitting through loosened bricks or mortar into the chimney header and trimmer beams, spreading fire into the structure.

4. General Assignments (First Truck Company)

a. Force entry through main entrance on the first floor

b. Primary search of first floor

c. Check near and behind doors that lead to exterior for any occupants that may have been overcome while trying to escape

d. Determine the life hazard and rescue method as required

e. Locate and confine the fire

f. Ladder building as needed

g. Control ventilation of the fire area

h. Attempt an examination of the basement fire area

i. Primary search of the perimeter

j. Roof ventilation, if needed

5. General Assignments (Second Truck Company)

a. Primary search of all floors above the fire floor

b. Check near and behind doors that lead to the exterior for any occupants that may have been overcome while trying to escape

c. Reinforce laddering

d. Roof ventilation, if needed

e. Ensure the basement is examined for fire

f. Secure utilities. Exercise caution when searching for the electric panel. Do not pull meter pan unless authorized by the IC. (If no second truck company arrives, this is performed by first truck company.)

g. Secondary search of perimeter. (If no second truck company arrives, this is performed by first truck company.)

h. At basement fires, if the second hoseline has been stretched via an exterior basement entrance, perform coordinated search and examination of basement.