

The Commission on Fire Accreditation International  
The Deployment of Resources for Initial Fire Attack  
By John D. Wiseman

There are two events that are taking place that will have a profound influence upon the future of fire fighting in this country. The first event is the accreditation process that began in 1996. The attempt to establish professional standards (accreditation) for the fire service is the result of joint collaboration between two organizations.

- (1) The International Association of Fire Chiefs (IAFC), and
- (2) The International City/County Management Association (ICMA)

In 1998 these two organizations created a non-profit, trust corporation called the

Commission on Fire Accreditation International (CFAI)

This Commission is governed by a Board of Trustees (5 members) appointed by the parent organization. The Commission itself consists of eleven appointed members representing the various types of fire departments (classified by size) and related organizations with interests in fire protection.

The process of evaluation involves two phases, self-assessment and accreditation. To facilitate this process, a "Self-Assessment Manual" (1997, 3<sup>rd</sup> Edition) is available to guide the department. The time involved is about a year. During this time, the department submits information to the Commission which then decides whether a peer review is feasible, or whether further work is required. If the Commission decides to go ahead, then a date is set and a peer review team is appointed. The team visits the department for several days, and then makes its decision on accreditation. To date there are only a few fire departments that have completed the accreditation process.

The Self-Assessment Manual contains 10 categories with 45 criteria, 234+ performance indicators including 90 core competencies. The core competencies are considered to be pass/fail performance indicators that each accredited department must satisfy. If a fire department is involved in more than two programs (i.e. fire suppression and fire prevention), then there will be more than 234 performance indicators.

The criteria certainly provide a detailed and comprehensive means of evaluating the management and operations of a fire department. However, there is one critical element of the process, and it is recognized as such by the Commission. It is the issue of defining levels of service. The standards used to measure the levels of service are called the Standards of Response Coverage (SRC). The SRC is defined to be

"Those written policies and procedures that establish the distribution and concentration of fixed and mobile resources of an organization." (Section 6, Appendix A)

This definition presents a dilemma. Distribution and concentration have an inverse relationship with each other. That is, a wider distribution of resources results in less concentration. Likewise, a greater concentration of resources results in less distribution. This inverse relationship is coupled with the necessity of balancing the level of service with the level of risk.

Many fire departments do not face this dilemma. These departments are located in small towns and operate from a single fire station. The response time from this station is adequate to cover the entire town, and all the resources are located at this station. This is an ideal situation since the town itself is concentrated. The opposite situation occurs in rural areas where structures are scattered throughout square miles of a fire district. There is not enough concentration to justify distributing fire stations throughout the entire area. The result is a much slower response time that is to be desired.

So the dilemma occurs in fire departments located in large urban areas with multiple fire stations. In such urban areas, you will find different levels of risk that affect the distribution and concentration of resources. The higher the level of risk, of course, the greater concentration of resources is needed. The lower the level of risk, less concentration of resources that is needed, and resources can be distributed more widely.

The risk assessment in the Manual is based upon two factors, probability (frequency) of occurrence, and consequences of loss (property and life). These two factors may be combined in four ways:

Low Probability, Low Consequences  
 High Probability, Low Consequences  
 Low Probability, High Consequences  
 High Probability, High Consequences

These four categories are named as follows.

Low Risk  
 Moderate Risk  
 High Risk  
 Worst Risk

The low and moderate risk areas permit greater distribution of resources, while the high and worst risk areas require a greater concentration of resources.

The low and moderate risk categories include community or commercial building < 10,000 square feet in area, and one or two family dwellings. The high and worst risk categories include community and commercial building > 10,000 square feet in area, apartment building, and all unsprinklered buildings of high hazard nature.

What resources are needed to meet a Standard of Response Coverage? Let's focus on the moderate risk category and on one or two family dwellings. Seventy five percent of all structural fire fighting is done in such dwellings.

The Accreditation Manual states that "the key to a fire department's success at a fire is adequate staffing and coordinated teamwork". (Section 6, page 19). The manual identifies certain critical tasks that may need to be performed. They are:

<u>Critical Task</u>	<u>Number of FF</u>
Attack Line	2
Search & Rescue	2
Ventilation	2
Back Up Line	2
Pump Operator	1
Water Supply	1
Utilities/Support	1
Safety	1
Incident Command	1

TOTAL 13

This Standard of Response Coverage is based upon one premise, that there is only one way to fight a structure fire. This method is to go inside, always. The decision to go inside has the following consequences.

(1) Instead of one fire fighter handling the attack line, there must be two to facilitate the movement of the line inside. This is also an important safety requirement.

(2) At the point-of-entry there must be two fire fighters fully equipped with a charged line ready to back up the inside attack line. This is an OSHA requirement, in other, words, a legal requirement bending upon all fire departments.

(3) There must be a ventilation team of two fire fighters, responsible for horizontal or vertical ventilation. Again this is a safety requirement designed to prevent the attack team from being engulfed in steam. The idea is to provide an opening for the expanding steam to move outside the structure.

(4) There must be a Rapid Intervention Team (RIT) of two fire fighters capable of rescuing the attack team in case of trouble. Trouble usually means a collapse or flashover. The Utility/Support and Safety fire fighters could form such a team.

## Second Event

The second event is the proposal by the NFPA to adopt two new standards on the organization and deployment of fire suppression operations by career (NFPA 1710) and volunteer (NFPA 1720) departments. The proposed Standard for Response Coverage in NFPA 1710 (Section 3-2, 3.2.2) is almost identical to that recommended by the Accreditation Commission. The SRC for the first full alarm assignment shall provide:

- (1) Establishment of incident command, minimum of one.
- (2) Establishment of an uninterrupted water supply of 400 gpm for 30 minutes. One operator to remain with each pumper, total of two.
- (3) Establishment of water flow, application rate of 300 gpm from two hand lines, attack line two firefighters, and back-up line two firefighters.
- (4) Provision of one support/utility person for each line, total of two.
- (5) These two persons (4) may be assigned as an rapid intervention team (RIT).
- (6) A minimum of one victim search and rescue team, two firefighters.
- (7) A minimum of one ventilation team, two fire fighters.

The total for this deployment is 13 fire fighters, the same number specified in the Self Assessment Manual.

NFPA 1710 states that each pumper company shall be staffed with a minimum of four persons. Also a service/ladder company shall be staffed with a minimum of four persons. Five or six are specified as minimum staffing for each company in high hazard areas.

The Commission on Fire Accreditation (CFAI) does not set minimum standards for response coverage. Instead it has adopted the following policy.

“It is the policy of the Commission on Fire Accreditation that the level of staffing of fire and emergency apparatus on a per company or per apparatus basis must remain a local decision in order to allow jurisdictions appropriate flexibility to deal with their environment.” (Section 6, page 5)

Thus the CFAI does not require a minimum of four persons per company, or even the first alarm response of 13 firefighters to a house fire. Also CFAI does not require a minimum response time. NFPA 1710 sets the standard at within four minutes for the response of the first pumper company, and within eight minutes for the balance of the first alarm assignment for 90% of the incidents as determined by the fire department. What the CFAI permits is each department to “find a balance between effectiveness, efficiency, and reliability that will keep fire risk at a reasonable level.” (Section 6 page 2)

Regardless of whether the standard of response coverage is mandatory or optional, there is built into this standard the ultimate dilemma. This dilemma is far worse than trying to balance the level of

service with the level of risk, or even trying to balance the distribution and concentration of resources. In most instances, especially if the fire is located farther away from the center of the city, one fire truck will arrive first minutes ahead of the balance of the first alarm assignment. No matter whether this truck has three or four firefighters, the dilemma that confronts the officer in command is this

Shall I attack the fire with a team of two firefighters going inside?

Or

Shall I wait until the balance of the first alarm response is on the scene?

This is a cruel dilemma indeed. Firefighters are trained to act, and to act immediately consistent with safety. Yet taking immediate action places the lives of two firefighters in immediate jeopardy, and also places the officer-in-command in legal jeopardy. It is an OSHA requirement, binding on all fire departments, that when two firefighters enter a structure with a fire burning out-of-control, then there must be two additional firefighters outside, fully equipped, with a charged line. Further, the requirements forbid one firefighter from doing double duty which means that a total of six firefighters must be on the scene.

The only way that this dilemma can be avoided is if it is known that living victims are inside with the possibility of rescue. However, this is a rare occurrence for most fire departments.

### **The Solution**

There is a solution to this dilemma. First let's examine the layout of a typical house. Mobile homes excepted, houses usually have rooms in front and a row of rooms in the rear. The total number of rooms almost certainly exceeds the number of rooms that have direct access through an outside door. For the majority of rooms their only access is through a hallway or another room. A second almost universal feature of the typical house is that every room will have at least one window. This means that there is usually easy access to every room through an outside window.

In fact the fire itself usually provides easy access to a given room. It is a scientific fact of great importance to fire fighting that a plate glass window will break from thermal stress at a temperature range from 550° F (288° C) to 600° F (315° C). This temperature range is well below the temperature (1,000° F (537° C) at ceiling level) that are needed for flashover. So a fire will burn out a window early in the development of a structure fire.

Why not use an outside window or an outside door as access for a fog attack on a fire that is burning in that room? There is no reason on earth not to do so, provided you know how to properly use a fog nozzle. The key is that you must use the right amount of water since you must balance the heat absorbing power of steam with the heat releasing power of the fire itself. The best way to make this attack is by a combination attack with a clockwise rotation of the nozzle.

Using this method of attack has a number of advantages.

1. It is faster since the firefighter can almost always get in position for attack quicker. Going inside usually requires crawling, in an unfamiliar layout, with limited or no visibility
2. It is more reliable since it has easy access to the center of the fire. The inside attack has a high rate of failure to reach the center of the fire. The reason is simple enough—you cannot see where you want to go.
3. It is much safer since an outside attack avoids the real dangers of collapse and flashover. This is a slight risk of collapse of a porch if an outside door is being used.
4. The big advantage is that combination attack can be made with a minimum of two firefighters—a pump operator and one firefighter operating the attack line. A properly loaded preconnected attack line does not require a second firefighter to help stretch the line or operate the nozzle.

Further there is no need for a back up team, or an RIT team, or even a ventilation team. Amazingly enough, a combination attack made with the right amount of water does not require artificial ventilation. The attack itself will naturally ventilate the structure without any need for help from anyone else.

So this method of attack solves the dilemma face by the crew of the first pumper to arrive at the scene of a house fire. This crew can go ahead and control the fire without running afoul of any of the strict safety requirements that burden an inside attack. One further note about departments that use the combination attack. They will enter the structure as soon as possible with air packs to finish extinguishing and overhauling the fire. However, there is a vast difference between entering when the fire is under control, than when it is not under control

Since 75% of all structure fires occur in one or two family dwellings, and about 75% of all structure fires are confined to the room of origin, the combination attack should prove to be highly useful. However, there is one word of warning. No one tactic, or tool, will solve all of your fire fighting problems. On any give day, the nozzleman and the officer-in-command will have to decide the purpose of the attack, and then choose the best method of attack that will fit that purpose. The chances are that the combination attack through an outside window or through an outside door can be used with some frequency, but not always.

Using the combination attack will avoid any legal jeopardy. There is sufficient published research to satisfy any legal requirements. This method of attack is based upon a very careful analysis of fire behavior and water behavior. It is founded upon scientific facts and principles. The formula used to determine the right amount of water is validated by two scientific facts. Further, this formula is validated by Thornton's Rule that is the foundation for much of the research currently being done in fire engineering. The use of the combination attack makes fire fighting simple in nature and easy to execute, with an absolute minimum risk to the firefighters involved.

The realization that fire fighting can be simple and easy should result in the adoption of the combination attack into the standard of response coverage. However, for this to be done, probably a drastic change in attitude of fire commanders will be required. What I am talking about has been well expressed by Ed Comeau, writing in the NFPA Journal in July/August 1999 on page 80.

“According to NFPA 1500, Fire Department Occupational Safety and Health Program, the incident commander is required to integrate risk management into the regular functions of incident command. He or she must thus limit aggressive fire fighting to situation where lives are endangered and can possibly be saved, which means reducing risks to firefighters operating to protect property only, The standard goes so far as to say that no risk to firefighter's safety is acceptable when there's no possibility of saving lives or property.

The incident commander is also charged with evaluating the risk to members in terms of the purpose and potential results of their actions in each situation. Where the risk to firefighters is excessive, the standard calls for use of defensive operations only. And when fire involves a wood truss, the risk is compounded by the fact that fumes may stay hidden inside the truss structure, taking firefighters by surprise when the roof or floor fails.

It is vital that incident commands placing firefighters in hazardous situations ask themselves one fundamental question. “What are we trying to accomplish?” If lives can be saved, then calculated risks may be taken. If the building and its contents are the only things in danger, the fire ground strategy must take this into account. Incident commanders with qualms about taking a less aggressive approach should ask themselves whether they should put their firefighters at risk for a building owner who hasn't protected his or her property with a sprinkler system. Why risk irreplaceable lives to save replaceable property?”

There should be no doubt as to the proper answer to this question.

