

Four-Person Staffing Facts

“Two in/Two Out Rule”

Requires that there must be two firefighters outside before two firefighters can make entry into an Immediately Dangerous to Life and Health (IDLH) atmosphere.

- OSHA Standard,
- NFPA 1710

Fire Services Review 2005 (Independent Auditors hired by the City of Long Beach)

- *“Four-person engine companies are recommended for Long Beach. Multiple company operations are frequent in Long Beach. LBFD needs a lot of resources (firefighters) to perform fire operations. The City also has high call volume and many fire or emergency risks. While some cities are good candidates for three-person staffing, Long Beach is not.”*

NIST (National Institute of Standards and Technology)

Report on Residential Fire Ground Field Experiments 4/2010

- The four-person crews completed the same number of fire ground tasks (on average) 5.1 minutes faster — nearly 25% faster — than the three-person crew.
- Additional 6% (13 seconds with 2nd engine less than 1 minute away) difference in the “water on fire time” between the three- and four-person crews.
- The four-person crew operating on a low-hazard structure fire can complete laddering and ventilation (for life safety and rescue) 25% faster than the three-person crew.
- NFPA 1710 requires 15-17 FFs on scene in 8 minutes. The three-person crews were unable to assemble enough personnel to meet this standard. Four-person response time was 5:02 minutes.

International City Managers Association (ICMA)

- In a report “Managing Fire Services” ICMA recommends 5 per engine for municipal fire administration.

International Association of Fire Chiefs (IAFC)

- IAFC’s Metro Fire Chiefs’ minimum staffing position reads: “In order to permit effective operation of fire companies at the scene of a structure fire, the minimum number of personnel on both engines and ladder companies should be 5 members per unit.”

International Organization for Standardization (ISO)

- Insurance industry risk assessment calls for six-person response on initial fire attack (four firefighters plus two medics)

American Heart Association

- Policy calls for minimum of four responders to administer proper Advanced Cardiac Life Support (ACLS)

California Office of Emergency Services

- Statewide Mutual Aid Agreement mandates minimum four-person staffing on all mutual aid responses (such as wildfires, floods, earthquake, etc.)

American Insurance Association, “Fire Department Efficiency,” Special Interest Bulletin No. 131, December 1975

- Bulletin prepared by the American Insurance Association on fire department efficiency. Emphasis is placed on the importance of staffing companies with a minimum of four personnel. The bulletin further states that if companies are staffed with two or three personnel, they cannot perform the required functions of either an engine or ladder company.

American Insurance Association, "Fire Department Manning," Special Interest Bulletin No. 319, December 1975

-Bulletin prepared by the American Insurance Association on fire department staffing levels. Emphasis is placed on the importance of staffing companies with a minimum of four personnel. The bulletin further states that four personnel do not represent an adequately staffed company. It concludes with a statement that progressive fire chiefs believe a company should never respond with fewer than five or six personnel.

Cushman, Jon, Seattle, WA Fire Department's "Abstract: Report to Executive Board, Minimum Manning as Health & Safety Issue, 1981.

-This study, performed by the Seattle Fire Department, analyzed the link between staffing and fire fighter injuries by reviewing the average severity of injuries suffered by engine companies of fewer than four fire fighters as compared to companies with four or more fire fighters. The study concluded that the average time per disability increased as company strength decreased for both types of companies. This analysis indicated that the rate of fire fighter injuries expressed as total hours of disability per hours of fireground exposure were 54% greater for engine companies staffed with three personnel when compared to those staffed with four fire fighters, while companies staffed with five personnel had an injury rate that was only one-third that associated with four-person companies.

Gerard, John C. and Jacobsen, A. Terry, "Reduced Staffing: At What Cost?," Fire Service Today, September 1981; pp. 15-21

-This study concluded that an aggressive early initial interior attack on a working structural fire results in greatly reduced loss of life and property damage. Given that the progression of a structural fire to the point of flashover generally occurs in less than 10 minutes, two of the most important elements in limiting the spread of fire are the quick arrival of sufficient numbers of personnel and equipment to attack and extinguish the fire as close to the point of its origin as possible.

International City Managers Association, Municipal Fire Administration (Chicago, IL:ICMA) 1967; pp. 161-162

-The ICMA concluded that there must be enough personnel to put fire apparatus into effective use. It determined that a minimum of five personnel are required for engine (pumper) companies, three personnel are needed to place a single line of 2 ½ -inch hose in service, and one additional person, plus a foreperson, is needed to operate a pump.

International Association of Fire Fighters, "Analysis of Fire Fighter Injuries and Minimum Staffing Per Piece of Apparatus in Cities With Populations of 150,000 or More," December 1991.

-This study was a comprehensive analysis of fire fighter injuries and minimum staffing levels in a number of cities. The study found that 69% of jurisdictions that maintained crew sizes of fewer than four fire fighters had fire fighter injury rates of 10 or more per 100 fire fighters, while only 38.3% of jurisdictions maintaining crew sizes of four or more fire fighters had comparable injury rates. In other words, jurisdictions having crew sizes of fewer than four fire fighters suffered a benchmark injury rate at nearly twice the percentage rate of jurisdictions that maintained crew sizes of four or more fire fighters.

Kimball, Warren Y., Manning for Fire Attack (Boston, MA: NFPA) 1969.

-This book thoroughly covers staffing of fire companies. In summary, effective fireground staffing was demonstrated to involve two fundamentals; first, carefully engineered equipment components designed to deliver specified fire extinguishing capacity under stated conditions and second, personnel assigned and used to deliver specified fire attack capabilities. In other words the fire firefighting capability of a fire department ultimately depends upon a complete systems approach and not a mere massing of random forces when an emergency occurs.

McManis Associates and John T. O'Hagan and Associates, "Dallas Fire Department Staffing Level Study," June 1984; pp. 1-2 & II-1 through II-7.

-The Dallas Study is a benchmark study of the link between crew size and fire suppression effectiveness. This study was performed as a series of controlled evolutions on a specified set of fire situations using different components in the range of four to six people. Significantly, the study found that "fatigue was a serious problem for smaller groups." Indeed, the author of a 1993 memorandum concluded that this finding was relevant because it highlights the link between staffing and fire fighter deaths and injuries.

Metro Chiefs/International Association of Fire Chiefs, "Metro Fire Chiefs-Minimum Staffing Position," May 1992.

-In 1992, the Metro Fire Chiefs Division of the ICHIEFS not only endorsed assembling at least four fire fighters before initiating an interior attack, but went a step further stating: In order to permit the effective operation of fire companies at the scene of a structure fire, the minimum number of personnel on both engine and ladder companies should be five members per unit. This firm position was taken by the Metro Fire Chiefs solely in the interest of the safety of both the citizens we serve and our nation's fire fighters.

Morrison, Richard C., "Manning Levels for Engine and Ladder Companies in Small Fire Departments," 1990.

-The conclusions reached in the Dallas study were confirmed for small fire departments by the Westerville, Ohio Fire Department. Using standard fire fighting tactics, the results of the Westerville Fire Department report showed that four fire fighters could perform rescue of potential victims 80% faster than a three fire fighter crew.

National Fire Academy, Executive Development Program III, "Fire Engines are Becoming Expensive Taxi Cabs: Inadequate Manning," February 1981; pp. 2 & 4.

-This NFA report summarizes a 1977 test conducted by the Dallas Fire Department which consisted of a simulated fire involving several rooms at the rear of the third floor of an old school. This simulation was conducted to determine how long it took a three, four, or five-person team to advance its line to this area and get water on the fire. Immediately following those tasks, each individual's physical condition was assessed. Timing began as each engine company entered the schoolyard. The average time for the engine companies to complete the tasks is revealing. The three-person team average was 18.8 minutes. All personnel were exhausted, rubber legged, had difficulty standing up and were unfit for further fire fighting. The four-person team, conducting the very same test, averaged 10.29 minutes and upon completion, were nearing exhaustion. The five-person team averaged 6.15 minutes, and showed little evidence of fatigue at the end of the exercise.

National Fire Protection Association, "Decision of the Standards Council on the Complaint of M.E. Hines, Texas Commission on Fire Protection, concerning a Formal Interpretation of NFPA 1500, Standard on Fire Department Occupational Safety and Health Program," April 6, 1994.

-In 1993, the NFPA included in its NFPA 1500 Consensus Standard on Fire Department Occupational Safety and Health a requirement addressing the minimum number of fire fighters necessary to initiate an offensive interior attack on structural fire. This Tentative Interim Agreement (TIA) to the fire fighter safety standard states:

"At least four members shall be assembled before initiating interior fire fighting operations at a working structural fire."

Consequently, in 1994, Mr. M.E. Hines, Director of the Texas Commission on Fire Protection, sought formal clarification from the NFPA on this issue. NFPA's formal interpretation of how the four fire fighters should be assembled is as follows:

"...when a company is dispatched from a fire station together as a unit (which includes both personnel responding on or arriving with apparatus) rather than from various locations, the standard recommends that the company should contain a minimum of 4 fire fighters."

National Fire Protection Association, NFPA 1410 Training Standard on Initial Fire Attack, 2000.

-The NFPA 1410 Standard contains the minimum requirements for evaluating training for initial fire suppression and rescue procedures used by fire department personnel engaged in emergency scene operations. This standard specifies basic evolutions that can be adapted to local conditions and serves as a standard mechanism for the evaluation of minimum acceptable performance during training for initial fire suppression and rescue activities.

The following are pertinent excerpts from NFPA 1410:

3-2.2 In addition to the requirements set forth in 3-2.1, the company officer shall ensure that the following are accomplished in interior structural fires: (1) At least two fire fighters enter the immediately dangerous to life and health (IDLH) atmosphere and remain in visual or voice contact with each other at all time. (2) At least two fire fighters are located outside the IDLH atmosphere. (3) All fire fighters engaged in interior structural fire fighting use SCBA.

A-3-2.2 One of the two individuals located outside the IDLH atmosphere could be assigned an additional role, such as incident commander in charge of the emergency, or safety officer, as long as this individual is able to perform assistance or rescue activities without jeopardizing the safety or health of any fire fighter working at the incident.

Nevada Occupational Safety and Health Review Board, Administrator of the Division of Occupational Safety & Health v. Clark County Fire Department (Statement of Position and Stipulation), Docket No. 89-385, October 1990.

-Citing that the Clark County Fire Department had prior knowledge that units staffed with three personnel were unsafe, the Nevada Department of Occupational Safety and Health issued a complaint that the Fire Department had willfully violated the industry standards relating to fire fighter safety. In the late 1990, the NIOSH agreed to vacate the violation when the Clark County Fire Department stipulated that it would immediately "maintain minimum staffing levels at each fire station so that no engine or ladder truck shall be dispatched from a fire station, staffed with less than four person." In addition, the stipulation entered into the NIOSH and the Fire Department stated that: "Any engine or ladder truck manned with less than four persons shall be defined to be "unsafely manned."

Onieal, Denis G., "In Response to the Demand for Fire Department Cutbacks," Ed.D, Fire Engineering, August 1993.

-This study concludes that the only reliable available research data obtained under fire conditions indicate that four is the minimum staffing level for a fire fighting engine or ladder company. Cited research firmly and unequivocally concludes that for an engine company or ladder company, the minimum acceptable staffing level is four. That number of fire fighters is the minimum number required to successfully accomplish the fireground tasks required within an acceptable time period. Four is not the number at which negotiations begin, but it is the absolute bare minimum required for an effective and efficient fire company.

Roberts, Bill, Fire Chief, City of Austin, "The Austin Fire Department Staffing Study," March 1993.

-In 1993, the Austin Fire Department conducted a study to determine whether companies staffed with four fire fighters were safer and more effective than the three-person companies the department was currently deploying. In order to compare the effectiveness of fire companies, the physiological impact on fire fighters and Austin fire department injury rates at various staffing levels, the Fire Department conducted drills consisting of a series of common fireground tasks divided into three scenarios: a simulated two-story residential fire; a simulated aerial ladder evolution; and a simulated engine company high-rise fire. These simulations revealed that regardless of the experience, preparation or the training of fire fighters, loss of life and property increases when a sufficient number of personnel are not available to conduct the tasks required in an efficient manner. The severity and the degree of hazard increases until controlled or the fire passes the critical point. Consequently, the Austin Fire Department concluded that fire fighter effectiveness significantly improves when a company is increased from three to four personnel. In the two-story residential fire, the efficiency or time improvement between the three-person and four-person crew was 73% in the aerial ladder evolution, the efficiency improvement between the three-person and four-person crews was 66%. In

the high-rise fire, the efficiency improvement between the three-person and four-person engine company crew was 35%. In addition to the fireground simulation, the Austin Fire Department also reviewed injury reports involving 136 emergency incidents from 1989 to 1992 to which 1,938 fire fighters responded. The analysis revealed that the injury rate for four or five-person crews was 5.3 per 100 fire fighters while the three-person companies experienced an injury rate of 7.77 injuries per 100 fire fighters. The injury rate for the three-person companies was 46% higher than the rate for larger crews.

Brunacini, Alan V., "Shrinking Resources vs. Staffing Realities," *NFPA Journal*, May/June 1992; pp. 28 & 120

-Chief Alan Brunacini concluded that it is illogical to maintain that the requirements, capabilities and conditions of fire department operations differ from one place to another. Fire conducts, convects and radiates the same all over North America. As such, two fighters cannot conduct a primary search that requires six fire fighters for effective completion in a survivable time frame.

City of Long Beach Planning Department, "Long Beach General Plan Program Public Safety Element, May 1975/Reprinted in 2004.

-The scope and purpose of the General Plan is defined on page 1 of the General Plan (GP). Numerous objectives are defined: Complying with State Law, assist public officials in dealing with matters of safety and emergency occurrences, provide Citizens with an increased sense of security and well-being to name just a few. According to the GP Long Beach Fire Department was rated a "Class 1" fire department and the City of Long Beach was categorized a "Class IIA" by the Insurance Services Office (ISO). The GP made "immediate action recommendations" necessary for attaining the established public safety goals set forth in the GP. The first listed goal was to "improve the insurance services rating for Long Beach, implementation of recommendations of the Insurance Services Office for improving fire protection in the City should be considered seriously." California Government Code 65301.5 states "*The adoption of the general plan or any part or element thereof or the adoption of any amendment to such plan or any part or element thereof is a legislative act which shall be reviewable pursuant to Section 1085 of the Code of Civil Procedure.*"

Long Beach Firefighters, Local 372

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