

How to Use the Life Safety Code®

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Introduction

This paper will provide an overview of the fundamental requirements for life safety identified in the Life Safety Code®. The organizational structure of the code will be explained. Selected tips to help you navigate the code more effectively will be discussed.

Background

The National Fire Protection Association (NFPA) through the technical committee process produces over 300 codes, standards, and recommended practices. Over 7,000 volunteers do the actual writing of these documents. They are developed using a consensus process that is designed to create useful and effective requirements without an unrealistic burden on end users. Technical committees must be balanced which ensures that all interest groups may have a seat at the table. A robust public comment procedure also permits anyone with interest in the final document to provide input that the committee must address. It is a sometimes messy but remarkably effective way to develop safety requirements.

Codes differ from standards and recommended practices in that they are specifically written with adoption as law in mind. Codes are also foundation documents, meaning that they consolidate the requirements from numerous other standards by using them as mandatory references. For example, where the Life Safety Code® requires sprinkler systems it references the requirements from NFPA 13 Standard for the Installation of Sprinkler Systems. This in essence makes the entire text of that standard part of the Life Safety Code®.

A long list of NFPA standards are mandatory references. There are also numerous standards from other organizations including American National Standards Institute, Inc. (ANSI), American Society of Mechanical Engineers (ASME), American Society for Testing and Materials (ASTM), and Underwriters Laboratories Inc.

There is also an interlocking effect within the other standards. For example, if the sprinkler system is required, then the National Fire Alarm and Signaling Code requires that a water flow alarm be tied to the building alarm system.

Which edition of the Code you use will be determined by your objective. If you are aiming at the most effective life safety you should use the most current Code which is the 2009 edition. If you are dealing with compliance issues OSHA recognizes compliance with the 2000 edition as providing equivalence to the Subpart E requirements in the general industry standards. Most of your compliance issues with Subpart L will also be handled although this is not specifically stated in the OSHA standard. If you are trying to comply with local authority having jurisdiction (AHJ) requirements you will need to research which edition of the Code has been adopted as law in the location you are concerned with. Recognize that adoption may have occurred at the state and/or local level. Just to make matters more interesting different governmental levels may not have adopted the same edition of the code. The Life Safety Code® is on a three-year revision cycle. This means that a new edition is published every three years. The majority of NFPA standards are on five year cycles.

Scope and Purpose of the Code

The Life Safety Code® (LSC) is intended to provide minimum requirements that will contribute to the survival and escape of occupants from facilities during a fire. The LSC covers construction, protection, and occupancy features that will minimize risk to people from the effects of a fire. The concept of minimizing risk is important. Risk from fire and other emergencies cannot be eliminated. Even if we spent vastly more resources than we do currently to create safer buildings the risk will not drop to zero. Driving risk down to an acceptable level is the best we can hope for.

The LSC goes into significant detail on the design of egress components to allow for the prompt escape of occupants. It also covers a wide variety of related items such as detection and alarm systems, fire suppression systems, and others that contribute to life safety by providing additional time for escape.

The LSC focuses primarily on the threats from uncontrolled fires. Spin off benefits that may contribute to protecting people during other types of emergencies exist. The LSC is clear though that these are not the main emphasis.

Fundamental Requirements

Defense in depth is a key concept for any process where reliable performance is essential. This means that we should avoid counting on one measure to handle the entirety of an issue. Where critical performance is needed multiple approaches should be applied so that if one does not work perfectly at the time of the emergency the other can still offer protection.

The appropriate measures to ensure life safety in a building depend on a number of factors. The size and layout of the building will impact what is needed. The occupancy type is a major consideration. The number and type of occupants will also play a role. What fire protection features have been installed will influence life safety.

With a few exceptions, most areas require two exits. This is to help ensure that at least one exit will be available during an emergency. Two exits does not mean only two doors or door

panels. To count as two separate exits the doors must be far enough away from each other so that they are unlikely to both be compromised by a single emergency.

Occupants must have clear unobstructed access to exits. All of the paths that a person may have to travel need to provide a safe continuous path that leads out of the building and eventually to the street outside. Items placed in front of doors or that obstruct corridors are only part of what we need to look at. Walking surface condition, handrails in stairs, overhead clearance, and many other items must also be examined.

Exits must be in operating condition. The components of doors must function properly. Panic and fire exit hardware must release as designed. Delayed egress and access control arrangements must work properly to release doors.

The path to an exit and the exit must be clearly identified. Exit signs must be provided in appropriate locations so that occupants are guided to exits. Exits themselves must be clearly distinguishable.

Occupants must be able to see to travel to the exit. Normal and emergency lighting must be adequate. All portions of the means of egress must have sufficient lighting for people to see.

Occupants must be made aware of emergencies so they can take appropriate action. Detection and alarm systems are an important part of life safety. Evacuation communication systems can significantly improve your ability to help people take appropriate actions during an emergency.

Building construction and protection should allow occupants adequate time for escape. Compartmentation can slow the spread of fire and smoke increasing the survivable time in the facility. Suppression systems make a major contribution to life safety.

Life Safety Code[®] Organization

Learning the basic layout and organization of the LSC is the first step in applying it effectively. Chapters one through four deal with general issues that form the foundation of the code.

Chapter five covers the performance based option. The performance based design concept allows flexibility to the user in accomplishing the objectives of life safety. It does not completely eliminate the need to apply prescriptive requirements. For example, if installing a sprinkler system is part of the design it must be installed according to NFPA 13.

Chapters six through ten contain the core requirements of the LSC. Which of the specific items from these chapters applies to a given facility is determined from the occupancy chapters.

Chapter eleven deals with special structures such as high rise buildings, towers, piers, and others. These structures add issues that must be handled effectively regardless of the occupancy type. For example, a business occupancy that is two stories must meet the requirements of the business occupancy chapter only. That same business occupancy at 15 floors would also need to meet the requirements for high rise buildings.

Chapters 12 through 42 are the occupancy chapters. Some occupancy types have a separate chapter for new and existing facilities. This concept allows the LSC to raise the bar on life safety without necessarily imposing retroactive requirements.

Chapter 43 covers building rehabilitation. This chapter covers the special concerns relative to repairs, renovation, modifications, and reconstruction of existing facilities. It also deals with historic buildings and the challenges they can present to life safety. Change of occupancy types is also covered in this chapter. For example, if an old industrial building is being converted into a business occupancy.

Annex A provide explanatory material that is specifically tied to a paragraph in the body of the code. When an annex A note is available the LSC user should always read this information.

Annex B through D provide additional non-mandatory information.

A comprehensive index is provided. As with any reference document the index can be a valuable tool for the user.

When reading the LSC it is important to understand the significance of the editorial marks (see Figure 1).

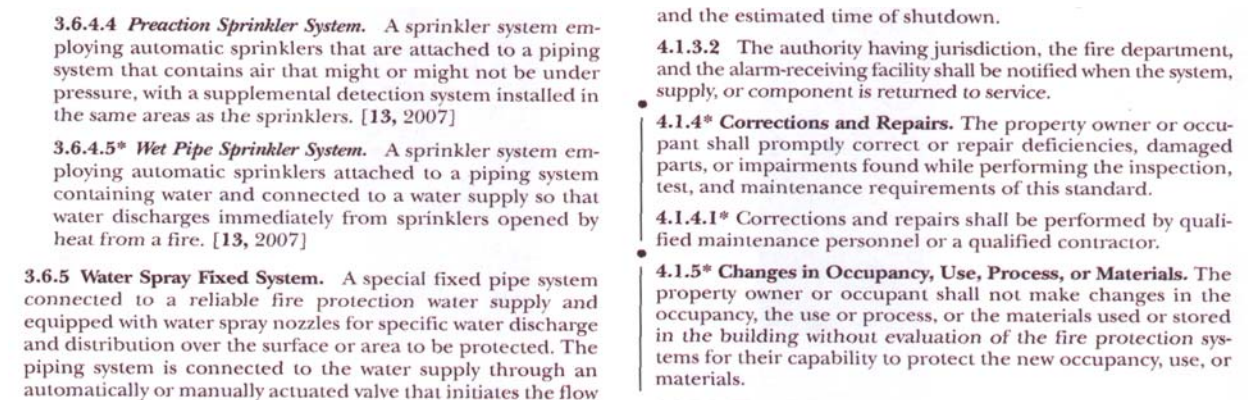


Figure 1. Life Safety Code with Editorial Markings

The vertical rule in the margin next to a paragraph indicates the requirements of this paragraph have changed since the last edition of the LSC. A bullet between paragraphs indicates that a paragraph has been removed. An asterisk behind the paragraph number indicates that there is information in annex A concerning the paragraph. Brackets at the end of the text of a paragraph indicate that the paragraph is a direct quote from another standard. For example, in the above the [13, 2007] indicates that the quoted text is from NFPA 13 2007 edition.

Each occupancy chapter is organized in a consistent way. This is a major advantage to the user.

General occupancy chapter organization

- .1 General requirements
- .2 Means of Egress Requirements
- .3 Protection
- .4 Special Provisions
- .5 Building Services
- .6 Reserved
- .7 Operating Features

Exception Examples

- 16.6 day care homes
- 32 & 33 residential board and care
- 42.6 aircraft hangars

Chapter.1 General Requirements

- 1.1 Application
- 1.2 Multiple Occupancies
- 1.3 Definitions
- 1.4 Classification of Occupancy
- 1.5 Classification of Hazard of Contents
- 1.6 Minimum Construction Requirements
- 1.7 Occupant Load

Chapter .2 Means of Egress

- 2.1 General
- 2.2 Components
- 2.3 Capacity of Means of Egress
- 2.4 Number of Exits
- 2.5 Arrangement of Means of Egress
- 2.6 Travel Distance to Exits
- 2.7 Discharge from Exits
- 2.8 Illumination of Means of Egress
- 2.9 Emergency Lighting
- 2.10 Marking of Means of Egress
- 2.11 Special Means of Egress Features

Chapter.3 Protection

- 3.1 Protection of Vertical Openings
- 3.2 Protection from Hazards
- 3.3 Interior Finish
- 3.4 Detection, Alarm, and Communications Systems
- 3.5 Extinguishment Requirements
- 3.6 Corridors
- 3.7 Subdivision of Building Spaces

Chapter.4 Special Provisions

Chapter.5 Building Services

5.1 Utilities

5.2 Heating, Ventilating, and Air Conditioning Equipment

5.3 Elevators, Escalators, and Conveyors

5.4 Rubbish Chutes, Incinerators, and Laundry Chutes

Chapter.6 Reserved

Chapter.7 Operating Features

For example, if you are looking for the occupant load for a new business occupancy you will find it in 38.1.7. If you want to find the occupant load for an existing industrial facility you can find it in 40.1.7.

Using the Life Safety Code®

When applying the provisions of the LSC always begin in the correct occupancy chapter. When the requirements from the core chapters apply is determined by these chapters. For occupancy types with new and existing chapters you must also make that determination initially.

New should be self-explanatory. Existing is the status a facility attains when the plans are approved by the AHJ. This means that if you got your plans approved the day before publication of the current edition of the LSC your building is now an existing building even if no construction has begun.

After you have determined which of the occupancy chapters applies to the facility you can begin to look at the requirements. The occupancy chapter tells you when particular items are permitted or required. The core chapters cover the details of how to accomplish what is necessary.