

United States of America

Status of Codes

The National Fire Protection Association (NFPA) is advancing building codes to provide options for the development of structures by providing the design option of either prescriptive-based development or performance-based development. This option can be found in *NFPA 101[®] Life Safety Code[®]*, 2000 Edition. There are several other documents which do, and in the future will, have the same option, including the *NFPA Building Code[™]*.

Structure

Documents in the *NFPA Consensus Codes Set[™]* fall into four categories: codes, standards, recommended practices, and guides. Codes and standards are divided into the text of the code or standard and informational material. The text of the code or standard consists of the mandatory requirements. All nonmandatory or informational text shall appear in one or more separate annexes. The text of an NFPA recommended practice consists of recommendations, while the text of an NFPA guide can contain both recommendations and explanatory material. (NFPA recommended practices and guides may not be adopted into law because they do not contain any mandatory language.) The provisions of NFPA codes discussed below are contained in the text and are therefore mandatory requirements, unless otherwise noted.

The provisions provided in the *Life Safety Code* address the construction, protection, and occupancy features necessary to minimize danger to life from fire. The code's goal is to determine the minimum criteria for the design of egress facilities to enable prompt escape of occupants from buildings or, where desirable, into safe areas within buildings. The *Life Safety Code* is set up in such a manner that the life safety design must meet the stated goals and objectives using either the prescriptive-based provisions or the performance-based provisions.

Prescriptive-based provisions are used in a code or standard that prescribes fire safety for a generic application or building use. Life safety is achieved by specifying certain construction characteristics, limiting dimensions, or protection systems without referring to how these requirements achieve a desired fire safety goal. Fixed values are generally stated to ensure a system is properly designed.

When using a prescriptive-based option, an alternative or equivalent method may be desired. An equivalency uses an alternative system, method, or device that is approved as equivalent and therefore recognized as being in compliance with the code without actually meeting the exact requirements of the code. The use of an equivalency is a means of meeting the intent of the prescribed code provisions without strictly adhering to the prescriptive provisions. The approval of an equivalency is at the discretion of the

Authority Having Jurisdiction. This approach should not be confused with a performance-based option.

Performance-based designs are based on an engineering approach to fire protection design which first establishes goals and objectives. The next step is to apply accepted engineering tools and methodologies (i.e., deterministic and/or probabilistic analysis) to the fire scenarios stipulated in the *Life Safety Code* and compare the quantitative assessment of the design alternatives to the criteria, also defined in the *Life Safety Code*.

Figure 1 provides a schematic of the *Life Safety Code*, 2000 edition compliance process. Each of the sections identified in Figure 1 are mandatory and, with the exception of Section 4.2, has nonmandatory material in an annex (i.e., an appendix). The nonmandatory material for Section 5.2, Performance Criteria, suggests four possible methods of quantifying the qualitative criteria provided in Section 5.2.

The overall focus of this concept is to determine the goals, objectives, and performance criteria for a design to properly ensure life safety for the structure. The use of computer fire modeling is used to help verify and assess the design for several different established types of fire scenarios. The key element in this process is to keep accurate and continuous documentation throughout the entire design of the project, which the *Life Safety Code* also stipulates. This will ensure an overall understanding of the operations and maintenance that must occur in the future when the building is occupied. This process is discussed in detail in the *SFPE Engineering Guide to Performance-Based Fire Protection Analysis and Design of Buildings*.

Key Features

While both options provide an adequate level of life safety, the option using performance-based elements allows greater freedom for the designer. This enables the designer to have increased flexibility regarding innovation in design, construction methods and materials selection, to have equal or better fire safety, and to optimize the fire safety design with respect to the available resources.

Further Information:

National Fire Protection Association
<http://www.nfpa.org>

Society of Fire Protection Engineers
<http://www.sfpe.org>

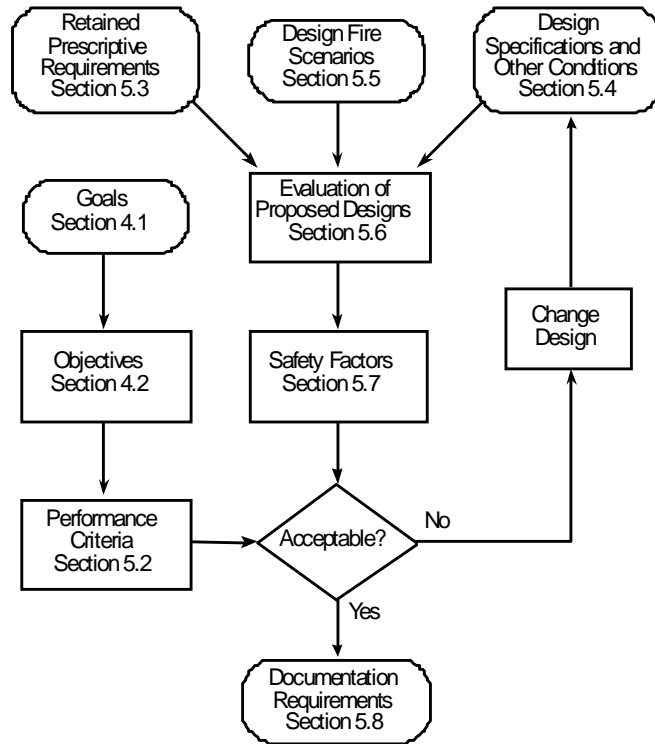


Figure 1. Performance-Based *Life Safety Code* Compliance Process.