

## § 102-80.120

time available for escape. The difference between the minimum time available for escape and the time required for evacuation of building occupants would be the target margin of safety. Various alternative protection strategies would have to be evaluated to determine their impact on the times at which hazardous conditions developed in the spaces of interest and the times required for egress. If a combination of fire protection systems provides a margin of safety equal to or greater than the target margin of safety, then the combination could be judged to provide an equivalent level of safety.

(c) As a third option, other technical analysis procedures, as approved by the responsible agency head, can be used to show equivalency.

### **§ 102-80.120 What analytical and empirical tools should be used to support the life safety equivalency evaluation?**

Analytical and empirical tools, including fire models and grading schedules such as the Fire Safety Evaluation System (Alternative Approaches to Life Safety, NEPA 101A) should be used to support the life safety equivalency evaluation. If fire modeling is used as part of an analysis, an assessment of the predictive capabilities of the fire models must be included. This assessment should be conducted in accordance with the American Society for Testing and Materials Standard Guide for Evaluating the Predictive Capability of Fire Models (ASTM E 1355).

### **§ 102-80.125 Who has the responsibility for determining the acceptability of each equivalent level of safety analysis?**

The head of the agency responsible for physical improvements in the facility or providing Federal assistance or a designated representative will determine the acceptability of each equivalent level of safety analysis. The determination of acceptability must include a review of the fire protection engineer's qualifications, the appropriateness of the fire scenarios for the facility, and the reasonableness of the assumed maximum probable loss. Agencies should maintain a record of each accepted equivalent level of safety analysis and provide copies to fire de-

## 41 CFR Ch. 102 (7-1-11 Edition)

partments or other local authorities for use in developing pre-fire plans.

### **§ 102-80.130 Who must perform the equivalent level of safety analysis?**

A qualified fire protection engineer must perform the equivalent level of safety analysis.

### **§ 102-80.135 Who is a qualified fire protection engineer?**

A qualified fire protection engineer is defined as an individual with a thorough knowledge and understanding of the principles of physics and chemistry governing fire growth, spread, and suppression, meeting one of the following criteria:

(a) An engineer having an undergraduate or graduate degree from a college or university offering a course of study in fire protection or fire safety engineering, plus a minimum of 4 years work experience in fire protection engineering.

(b) A professional engineer (P.E. or similar designation) registered in Fire Protection Engineering.

(c) A professional engineer (P.E. or similar designation) registered in a related engineering discipline and holding Member grade status in the International Society of Fire Protection Engineers.

## ROOM OF ORIGIN

### **§ 102-80.140 What is meant by "room of origin"?**

Room of origin means an area of a building where a fire can be expected to start. Typically, the size of the area will be determined by the walls, floor, and ceiling surrounding the space. However, this could lead to unacceptably large areas in the case of open plan office space or similar arrangements. Therefore, the maximum allowable fire area should be limited to 200 m<sup>2</sup> (2000 ft<sup>2</sup>), including intervening spaces. In the case of residential units, an entire apartment occupied by one tenant could be considered as the room of origin to the extent it did not exceed the 200 m<sup>2</sup> (2000 ft<sup>2</sup>) limitation.