

Fire and Life Safety Aspects of Emergency Planning

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Safety Design in Buildings



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Aon Fire Protection Engineering



Course Description

This course serves as an overview of fire and life safety considerations in emergency planning. The presentation covers regional and international requirements for emergency planning in the codes and standards and discusses critical aspects to be addressed by the various stakeholders in building design, fire life safety systems implementation, and building operation.



Presenter

Shamim Rashid-Sumar, P.E., has over 13 years of experience in building and fire code consulting, fire dynamics, timed egress modeling, and performance based design. Since graduating with a B.S. in Fire Protection Engineering from the University of Maryland, she has performed fire protection evaluations, prepared fire and life safety strategies and design specifications, fire alarm system design, and other engineering analyses and studies. She has worked on a multitude of projects including government facilities, hospitals and medical centers, airport terminals, museums, high-rise buildings, hotels, shopping malls, and many special use facilities. She has recently joined Aon Fire Protection Engineering Corporation in Dubai as Director of Business Development and Project Manager.

Ms. Rashid-Sumar was instrumental in establishing and currently serves as President of the UAE International Chapter of the Society of Fire Protection Engineers (SFPE). Prior to joining Aon FPE, she was responsible for establishing and managing RJA's Middle East office, where she most recently served as Vice President of Middle East Operations.



Learning Objectives

- 1. Introduction and Overview of NFPA and other Code Requirements for Emergency Planning*
- 2. Discuss in which types of facilities Emergency Plans are required*
- 3. Identify critical aspects to be addressed in building and fire life safety systems design*

The purpose of this presentation is to convey technical knowledge to the conference participants.

The presentation also contains slides with text that summarises the content of the presentation and the main learning objectives.

These may be used to update CPD records for relevant organisations including the Chartered Institute of Buildings (CIOB).

Summary

- **What is emergency planning?**
- **Why develop an emergency plan and why is it critical?**
- **What are the code requirements?**
- **Where does emergency planning impact design?**

What is Emergency Planning?

- **Process of developing a documented program designed to provide end users with the ability to manage the initial responses to various types of emergencies**
- **Should be developed and tested to ensure the program is implemented as needed based on the type nature and severity of the emergency and its affect on occupants**
- **Should be integrated with the response of the Local Authorities**



Why develop an Emergency Plan?

- **Drivers for Development**
 - Regulatory Requirements
 - Insurance Requirements
 - Improvement of Public Image
 - Post-Incident Review/ Refinement
 - Change in Operations



Why is Emergency Management Critical?

- **A documented and tested plan can:**
 - Improve a firm or entity's **REPUTATION**
 - Potentially lower insurance premiums
 - Reduce Legal **EXPOSURES**
 - Strengthen **RELATIONSHIPS** with authorities



Fire Safety Concepts Tree - NFPA 550

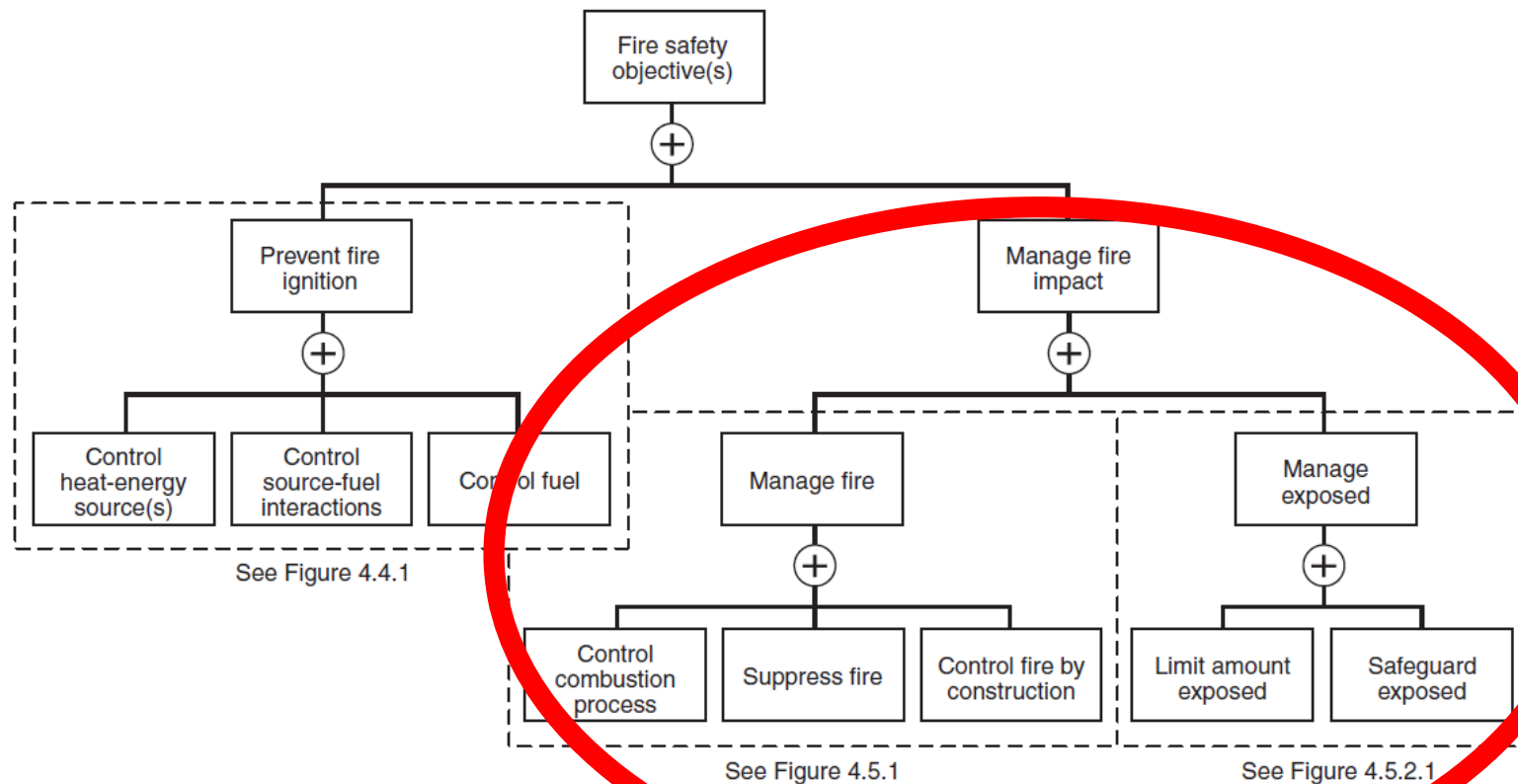


FIGURE 4.3 Top Gates of the Fire Safety Concepts Tree with Selected Lower-Tiered Gates.

Fire Safety Concepts Tree - NFPA 550

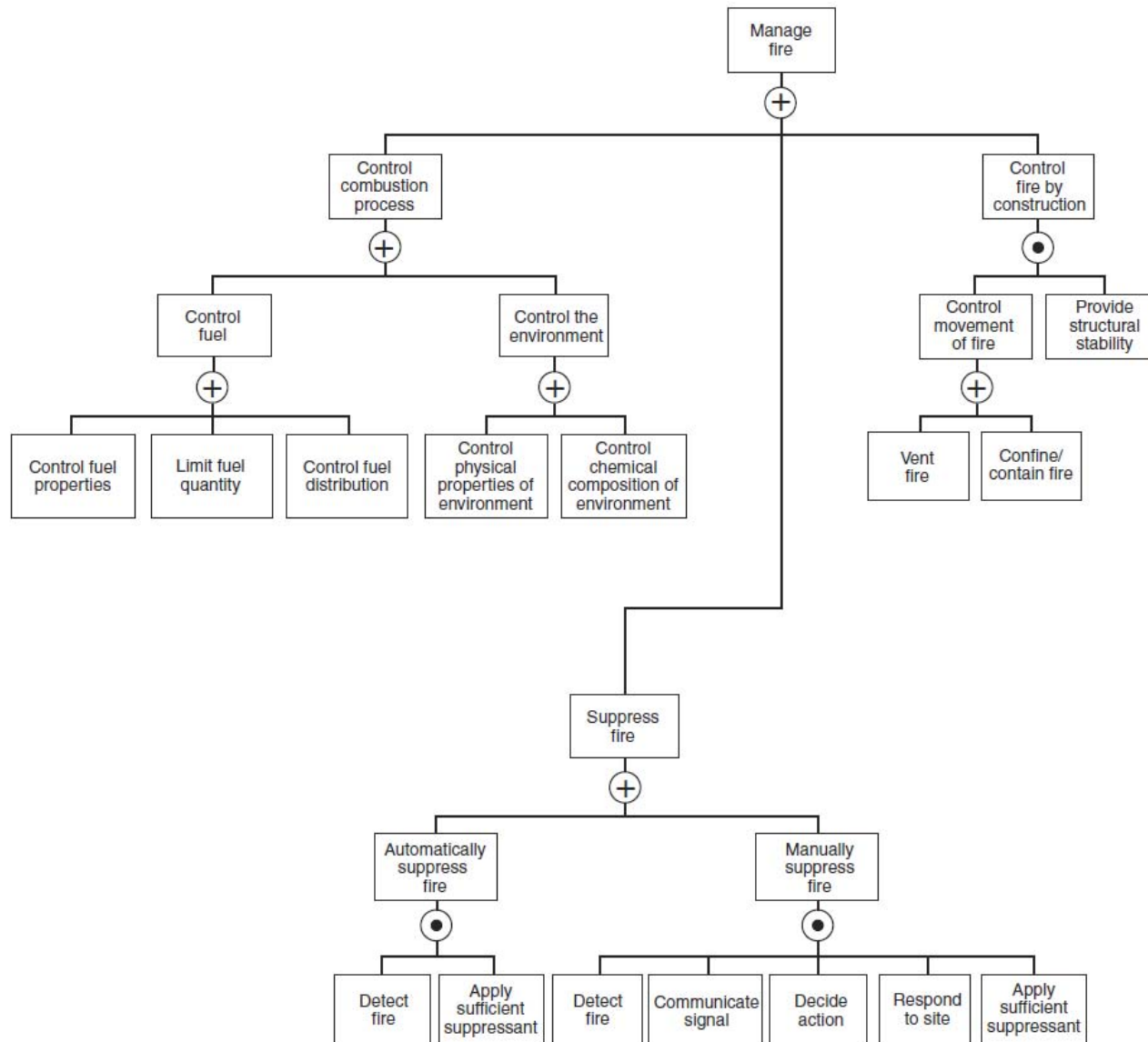
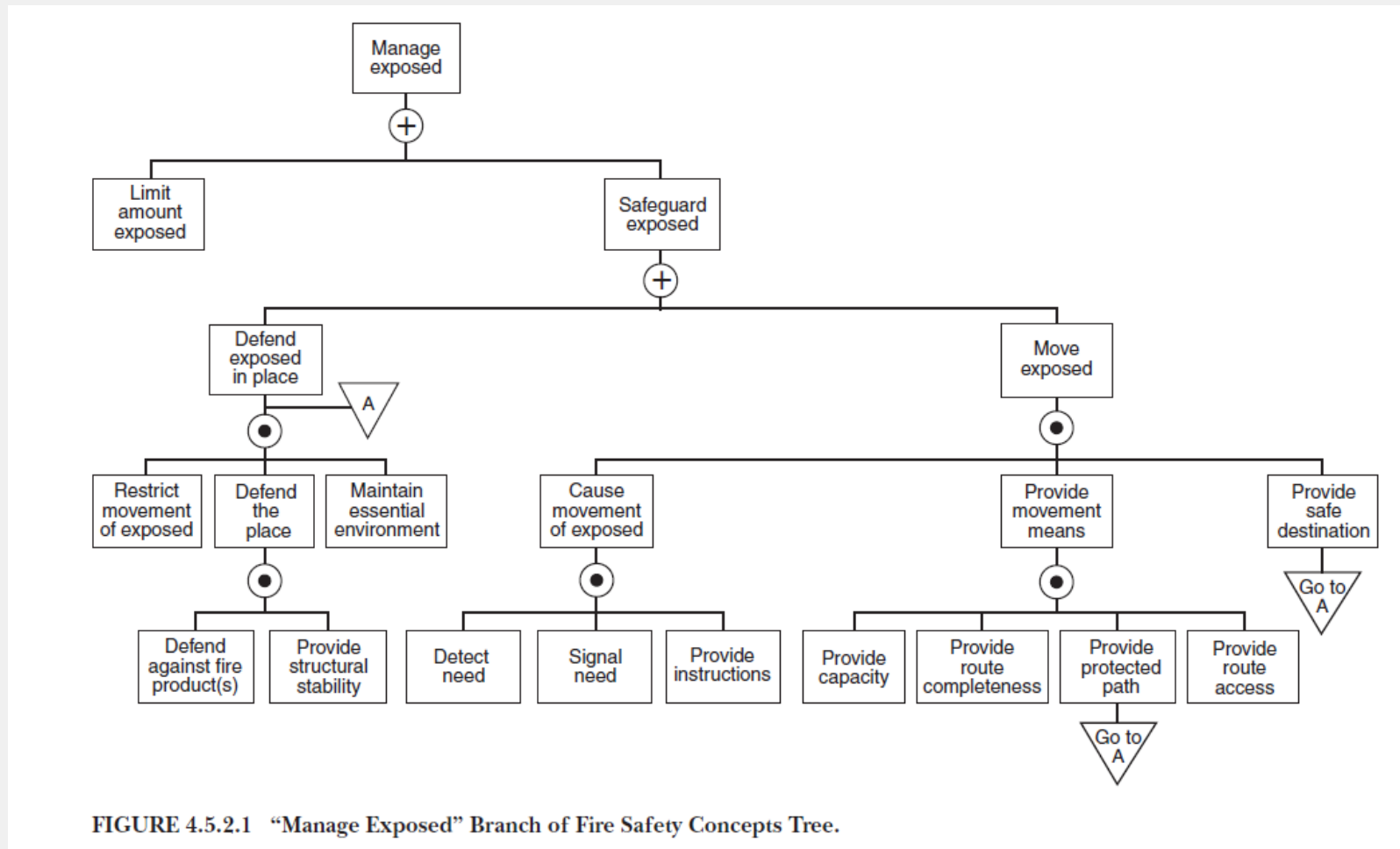
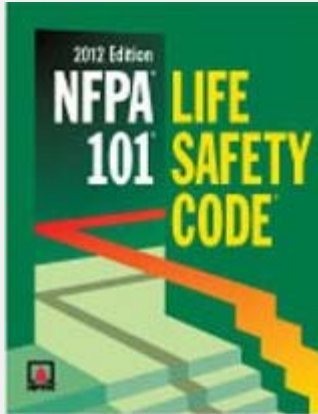


FIGURE 4.5.1 "Manage Fire" Branch of Fire Safety Concepts Tree.

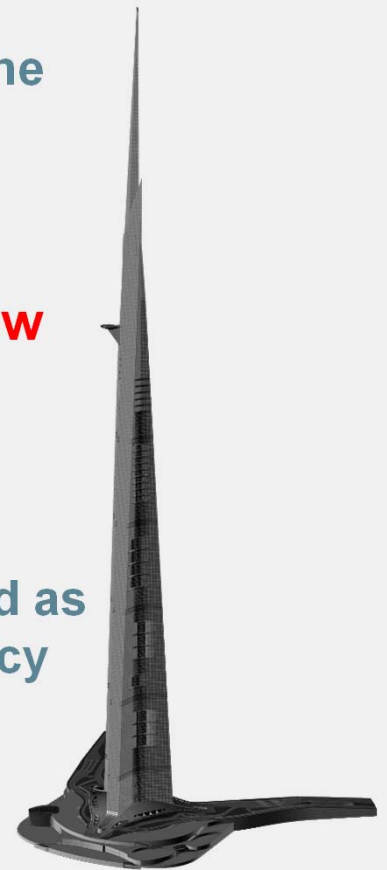
Fire Safety Concepts Tree - NFPA 550



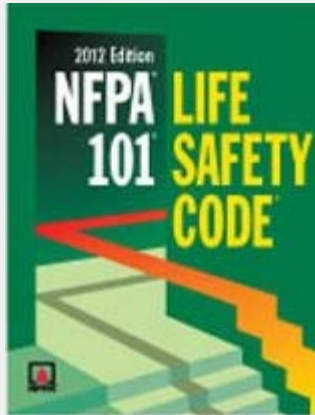
Code Requirements



- **In accordance with NFPA 101 Life Safety Code, Emergency Plans are required for:**
 - Specific occupancies or types of facilities
 - Where required by action of the Authority Having Jurisdiction (AHJ)
- **Emergency Plan must be submitted to the AHJ for review**
- **Emergency Plan must be reviewed and updated as required by the AHJ**
 - Periodic drills to be performed as required for specific occupancy

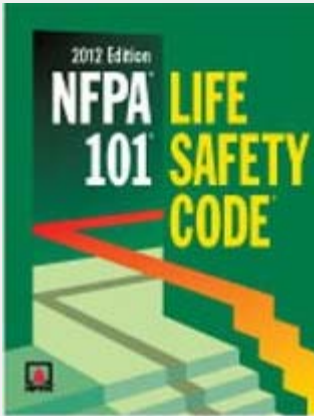


Code Requirements



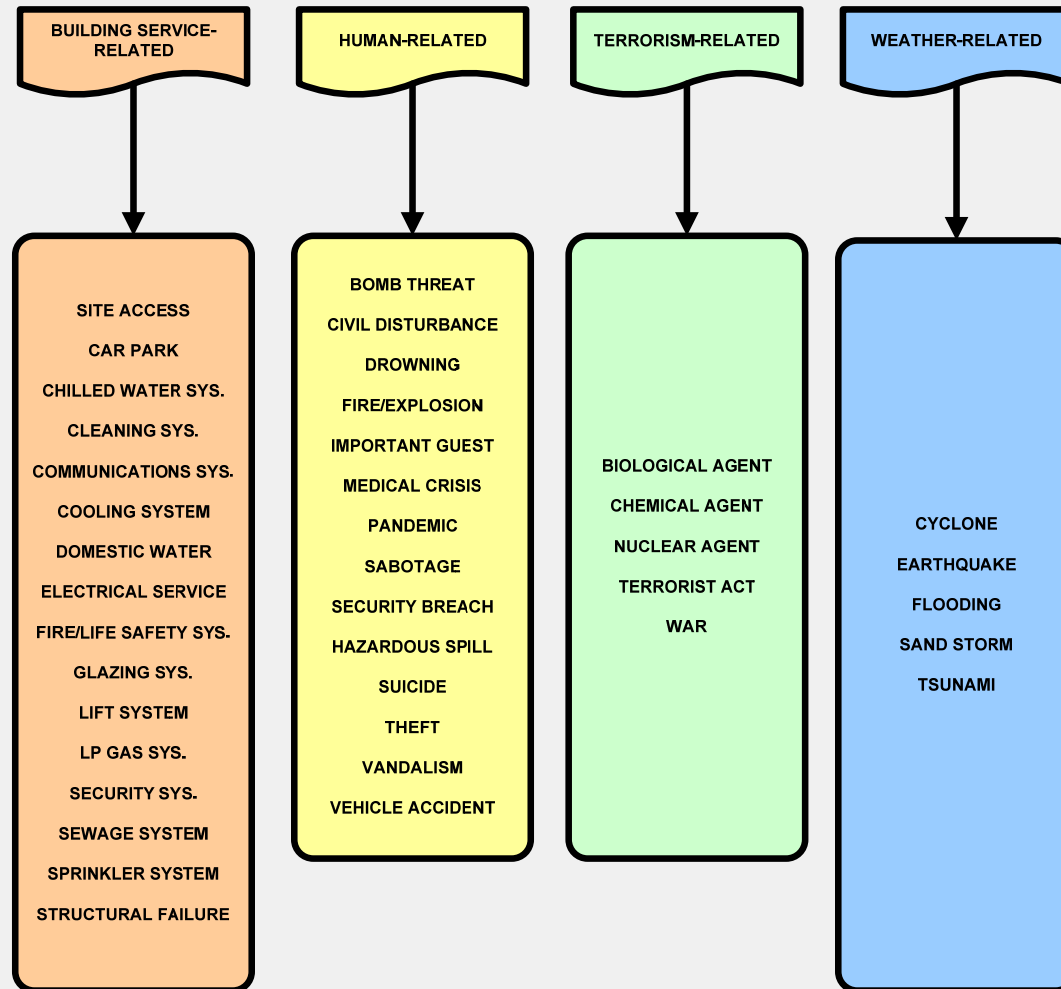
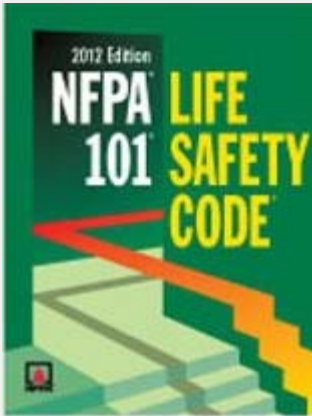
Occupancy or Feature	Reference	
Ambulatory Healthcare	20.7.1, 20.7.2	(all facilities)
Assembly	12.7.13, 13.7.13	(all facilities)
Business	38.7.1, 39.7.1	(based on occupant load)
Day-Care	16.7.1, 17.7.1	(all facilities)
Detention and Correctional	22.7.1.3, 23.7.1.3	(all facilities)
Educational	14.7.1, 15.7.1	(all facilities)
Healthcare	18.7.1, 18.7.2.2, 19.7.1, 19.7.2.2	(all facilities)
High-Rise Buildings	11.8.7, 12.7.13.2, 13.7.3.2	(all facilities)
Hotels and Dormitories	28.4.1.2, 28.7.5, 29.4.1.2, 29.7.5	(all facilities)
Mercantile	36.4.5.6, 36.7.1, 37.4.5.6, 37.7.1	(all facilities)
Occupant Evacuation Elevators	7.14.2.1	(all facilities)
Residential Board and Care	32.7.1, 33.7.1	(all facilities)

Code Requirements

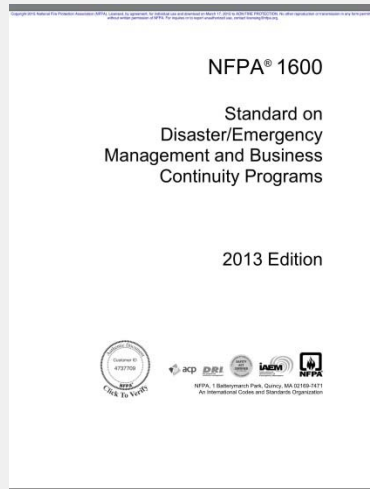


- **Emergency Plans shall include the following elements:**
 - Procedures for reporting of emergencies
 - Occupant and staff response to emergencies
 - Evacuation procedures appropriate to the building, its occupants, emergencies and hazards
 - Appropriateness of the use of elevators
 - Design and Conduct of fire drills
 - Type and coverage of building fire protection systems
 - Other items required by the AHJ

Code Requirements

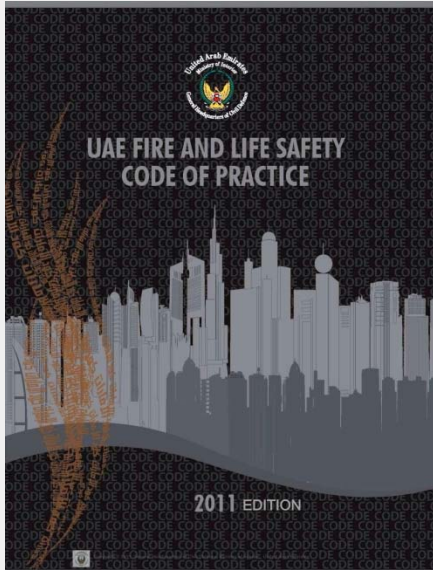


Code Requirements



- ***NFPA 1600 Standard on Disaster/ Emergency Management and Business Continuity Programs***
 - Additional resource for developing Emergency Plans
 - Establishes a common set of criteria for all hazards disaster/ emergency management and business continuity programs

Code Requirements



- **UAE Code Annexure B.2 – Emergency Action Plans**

- Mandatory requirement for preparation of a specific emergency plan for every facility
- Occupants shall be informed about their role in Emergency Management
- Responsibility for the preparation and implementation of specific emergency plans lies with the property owner and management firm/ facilities manager

UAE FIRE & LIFE SAFETY CODE OF PRACTICE [ANNEXURES: B.2 EMERGENCY ACTION PLANS]

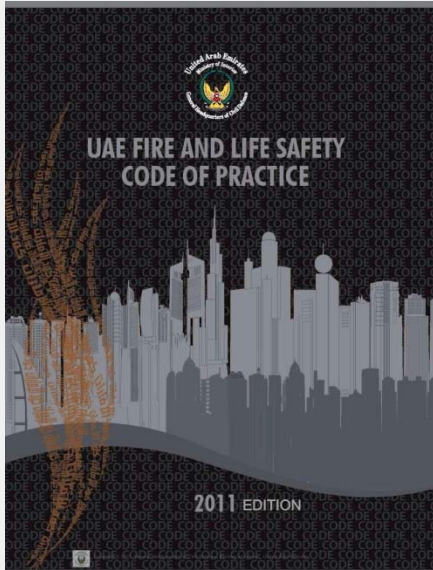
ANNEXURES

ANNEXURE B.2. EMERGENCY ACTION PLANS

1. INTRODUCTION
2. LIFE SAFETY AWARENESS
- 2.1. SOURCES OF FIRE
 - 2.1.1. Electrical installations
 - 2.1.2. Heating
 - 2.1.3. Smoking
 - 2.1.4. Rubbish
 - 2.1.5. Dangerous goods
 - 2.1.6. Arson
- 2.2. MEANS OF ESCAPE
- 2.3. PORTABLE FIRE EXTINGUISHER
- 2.4. SMOKE DETECTORS
- 2.5. OCCUPANT/FACILITY MANAGEMENT/STAFF TRAINING
- 2.6. FIRE DRILLS
- 2.7. OCCUPANTS/TENANTS/STAFF RESPONSIBILITIES
3. GENERAL EVACUATION PROCEDURES
- 3.1. RESIDENTIAL TENANTS
- 3.2. OFFICE TENANTS
- 3.3. DAYCARE / SCHOOL / UNIVERSITY STUDENTS
- 3.4. HEALTHCARE / CORRECTION & DETENTION OCCUPANTS
- 3.5. STORAGE / INDUSTRIAL OCCUPANTS
4. EVACUATION DRILL POLICY
5. BUILDING EVACUATION & ASSEMBLY POINT LOCATION
- 5.1. EMERGENCY PLAN
- 5.2. ASSEMBLY POINTS
6. AIDES TO THE DISABLED
7. RESPONSIBILITIES OF VARIOUS DESIGNATED EMERGENCY PERSONNEL
- 7.1. EVACUATION COORDINATOR RESPONSIBILITIES
- 7.2. FIRE WARDENS
- 7.3. FIRE RESPONDERS
- 7.4. FIRST AIDERS
- 7.5. ASSEMBLY POINT COORDINATOR
- 7.6. SECURITY SUPERVISOR
- 7.7. FACILITIES MANAGER
- 7.8. OCCUPANTS
- 7.9. DRILL MONITORS/OBSERVERS
- 7.9.1. FACILITY EVACUATION DRILL – OBSERVER CHECKLIST
8. CALLING "999" (LEVEL REFERENCE, THE UAE FIRE DEPARTMENT)
9. POST EMERGENCY EVALUATION AND ASSESSMENT
- 9.1. STRUCTURAL SECURITY
- 9.2. SAFE ENTRY
- 9.3. CLEAN UP SAFETY
- 9.4. AIR QUALITY ASSESSMENT
- 9.5. VENTILATION

Page 201

Code Requirements



- **UAE Code Annexure B.2 – Emergency Action Plans**

- Life Safety Awareness for occupants, facilities management, staff and tenants, including **training** and **drills** (every 6 months)
- Exiting and General Evacuation Procedures
- Building Evacuation and Assembly Point Location
- Accessibility/ Evacuation of mobility impaired persons
- Post emergency evaluation and assessment

UAE FIRE & LIFE SAFETY CODE OF PRACTICE [ANNEXURES: B.2. EMERGENCY ACTION PLANS]

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Page 201

Where does Emergency Planning Impact Design?

- **Variables in choosing a method of evacuation to limit the development and spread of fire and smoke and reduce the need for occupant evacuation**

- Design
- Construction
- Compartmentation

Fire should be limited to the room or compartment of fire origin, considering the following factors

- Overall fire resistance rating of the building
- Fire rated compartmentation provided within the building, or building evacuation zoning
- Number and arrangement of the means of egress

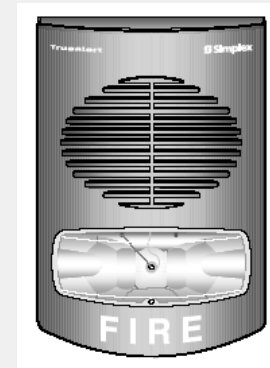
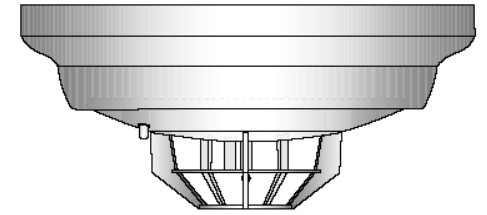


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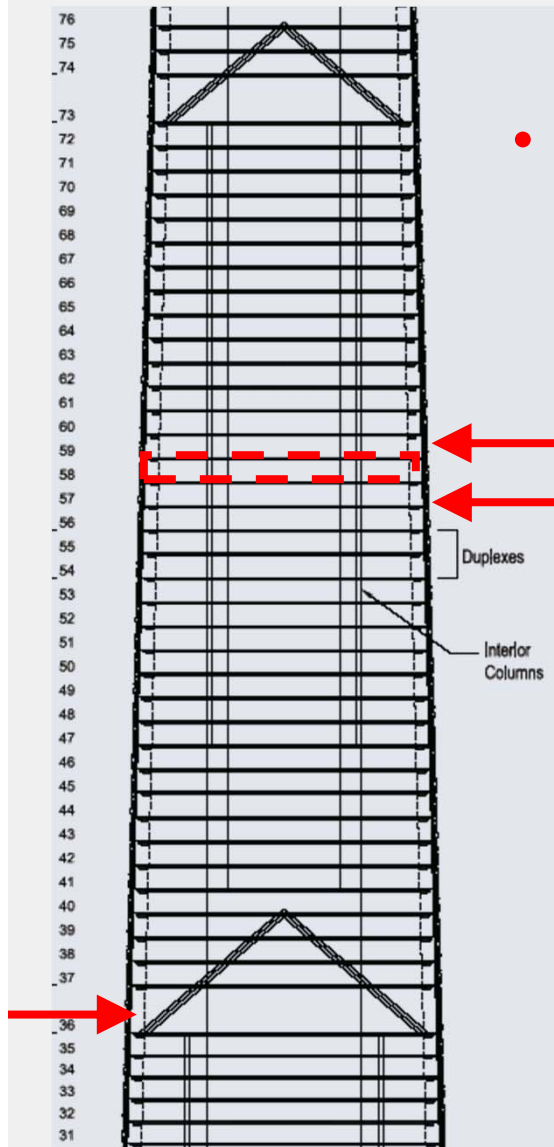


- **Fire Safety systems should be installed that compliment the method of evacuation, including:**

- Detection of fire
- Control of fire development
- Confinement of the effects of fire
- Extinguishment of fire
- Provision of refuge and/or evacuation facilities



Where does Emergency Planning Impact Design?



- **One of the most important fire safety systems is the fire alarm and communication system, particularly the notification system**

- Designed per *NFPA 72 National Fire Alarm and Signaling Code*

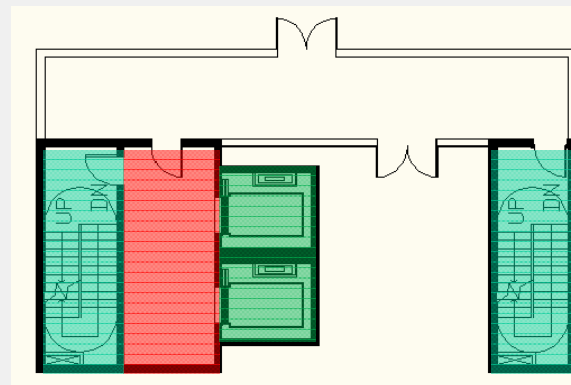
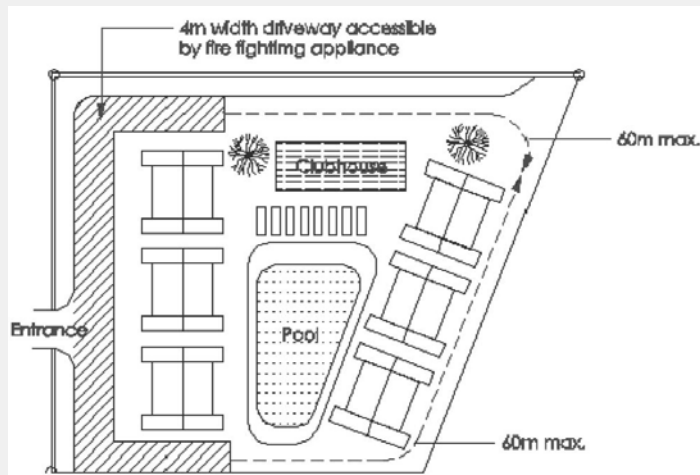
- Should take into account:

- Initial notification of only the occupants in the affected zone(s)
- Provisions to notify occupants in other unaffected zones to allow orderly evacuation of the entire building
- Need for live voice communication
- Reliability of the fire alarm and communication system

- Consider Mass Notification

Where does Emergency Planning Impact Design?

- **The ability of the fire department to interact with the evacuation should be analyzed; It is important to determine if the fire department can assist in the evacuation or if fire department operations hinder the evacuation efforts**
 - Fire department access to the external site
 - Fire department access to interior of the building



Conclusion

- **Emergency planning is a critical aspect to be considered in building design and operation.**
- **NFPA 101 and other codes provide specific requirements for Emergency plans and their implementation.**



Thank you

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