Crowd Management
Your role and responsibilities

Welcome
Bienvenidos
Bienvenue
Bem-vindos
欢迎
歓迎
오신 것을 환영합니다
ようこそ
Willkommen

Vincent Quintero, DSFM, CFI
Fire Safety Training Officer
Announcements

- Paperwork:
  1) Application;
  2) Test;
  3) Evaluation.
- Cell phones: silence / vibrate / off - need to take call please step out.

Generic

While the Information within this presentation is generic in format, it is provided, as well as, expected that each representative can customize the materials to fit into your own assembly occupancy needs.

Objectives

- Local Enforcement: Common Violations
- What is an assembly occupancy
- What is a Crowd Manager / Crowd Control
- Crowd Psychology / Festival Seating
- E. A. P. / Safety / Portable Fire Extinguishers
- Questions
RIGL 23-28.2-14. Enforcement

D) The following categories of violations of the Fire Safety Code that can be determined through inspection shall be considered as CRIMINAL VIOLATIONS of the Fire Safety Code and be subject to the above issuance of citations:

Impediment to Egress

Maintenance

1) 1st. Offense $250.00 per violation within 60 month period
2) 2nd. Offense $500.00 per violation within 60 month period
3) 3rd. Offense $1000.00 per violation within 60 month period
   plus mandatory court appearance

Break

Quick 5-minute

Assembly Occupancy
By definition:

According to NFPA Code 101 - 3.3.190.2* and NFPA 1 - 3.3.183.3*

Assembly Occupancy:

"An occupancy (1) used for a gathering of 50 or more persons for deliberation, worship, entertainment, eating, drinking, amusement, awaiting transportation, or similar uses; or (2) used as a special amusement building, regardless of occupant load."

Indoors

Indoors: Special Amusement
Outdoors

Indoors vs. Outdoors
No matter the type of assembly occupancy you are in and where you are situated, know where your closest exits are. Do not become complacent!
Pros & Cons: Indoors

Pros: structured / limited capacity / safety features / security advantage / defined egress / protection (weather & fire) / staffing / potentially unrestricted / plan flexibility

Pros & Cons Outdoors

Cons: weather / staffing / security / communications / defined aisle / limited capacity / limited use / available space / kiosk

Crowd Management
What is a Crowd Manager...

A Crowd Manager...
- Usually begins with:
  - Design - approved plans for every event
  - Operating features - protection (fire/safety/stacking/resources)...
  - People's Natural Behavior - contours of habit / event / external / internal factors
  - Understanding crowd's motion - interactions / social media
  - Motivation of members - communications

8 Steps Crowd Management & Event Planning Points
1) Investigate - data collection
2) Analyze - data collection & variable ID
3) Plan - choices or chance planning
4) Communicate - meetings, briefings through various forms
5) Execute - put Plan in motion
6) Supervise - roles of each manager
7) Crisis Management Program - should something happen what is my plan
8) Assess the "Plan" - debriefing / walk-through

These 8 steps are from Larry B. Peterson, CFE, CPP, "Crowd Safety & Survival" Practical Event & Public Gathering
Ratio (May See on Test)

NFPA 101 12/13.7.6.1  Assembly occupancies shall be provided with a minimum of one trained crowd manager or crowd manager supervisor. Where the occupant load exceeds 250, additional trained crowd manager or crowd manager supervisor shall be provided at the rate of one trained crowd manager/supervisor for every 250 occupants, unless otherwise permitted by the following:
(1) This requirement shall not apply to assembly occupancies used exclusively for religious worship with an occupant load not exceeding 500.
(2) The ratio of trained crowd managers to occupants shall be permitted to be reduced where, in the opinion of the authority having jurisdiction, the existence of an approved, supervised automatic sprinkler system and the nature of the event warrant.

NFPA

Training Requirements

Accordingly NFPA Code 101-12/13.7.6.2* and NFPA Code 1-20.1.5.6.2:
"The crowd manager shall receive approved training in crowd management techniques."

Additionally NFPA 101-A 12/13.7.7 and NFPA 1-A 20.1.5.8:
"It's important that an adequate number of competent attendant are on duty at all times when the assembly occupancy is occupied."

Training Requirements (new)
12/13/7/6/4*

- Understand crowd managers roles and responsibilities
- Understand safety concerns and security hazards that can endanger public assembly
- Understanding crowd management techniques
- Introduction to fire safety and fire safety equipment
- Understanding methods of evacuation and movement
- Understanding procedures for reporting emergencies
Training Requirements continued

- Understanding crowd management emergency response procedures
- Understanding the path of travel and exits, facility evacuation and emergency response procedures and, where provided, facility shelter-in-place procedures
- Familiarization with the venue and guest services training
- Other specific event-warranted training

*Training Program*

NFPA 101 A.12/13.7.6.2 The Training Program in Crowd Management should develop a clear appreciation of factors of space, energy, time, and information, as well as, specific crowd management techniques such as metering. Published guidelines on these factors and techniques are found in the SFPE Handbook of Fire Protection Engineering, Section 3, Chapter 13.

5 Basic Factors (may see again)

While there are a lot of contributing factors in the overall success of any event, the following 5 basic factors provided are key elements to the overall success of your event.
Time

Event / Crowd / Weather / Location / Obstacles / Permanent vs. Temporary / Preparation

- Certain designs, events, age and population requiring more time to enter/exit, egress points are a factor, widths, corridors, doors.
- Question: are the crowds going to build rapidly or will there be a slow accumulation?
- Note: crowds are more dangerous when they are on the move.

AVSS / NFPA / Larry Perkins, CFE, CPP, CMP

Source: AVSS / NFPA - Larry Perkins, CFE, CPP, CMP
www.CPP-Certified.org
SPACE H
Indoors / Outdoors / Occupant Load

Space
Crowd Density: How many people and what space will they occupy (NFPA 7 or 15 sq ft/person)
Once a person feels that his/her space has been violated (3 sq ft or below) anxiety sets in, and panic soon follows

Evaluation of Space: Max. Occupants

- Limitations (maybe on test)
- Three components of the Means of Egress
  A. E (Exit)
  B. EA (Exit Access)
  C. ED (Exit Discharge)
- Remoteness Test (2/3 / 1/2)
- Egress Capacity (num. of exits)

<table>
<thead>
<tr>
<th>Sq Ft PP</th>
<th>Seating</th>
<th>OL</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Waiting Space</td>
<td>266</td>
</tr>
<tr>
<td>5</td>
<td>FM Approval</td>
<td>160</td>
</tr>
<tr>
<td>7</td>
<td>Concentrated</td>
<td>114</td>
</tr>
<tr>
<td>11</td>
<td>Casino</td>
<td>72</td>
</tr>
<tr>
<td>15</td>
<td>Less Concentrated</td>
<td>53</td>
</tr>
</tbody>
</table>
Hillsborough Stadium disaster video

Hillsborough Stadium: Results

Fans rushed in crushing those already inside of full stadium
93 people crushed to death
3 others died from injuries

23 years later: PM David *Cameron said the families had suffered "a double injustice" in the failures of the police, fire officials and other authorities to anticipate the disaster or to contain its scale once it occurred* 06/12/2012 by New York
Space Demonstration

Crowd Density: How many people will occupy this 6' x 6' 30 sq. ft. space? (NFPA: 15, 7, 5, 3, 1.5 & 1.3 sq ft/person)

Audience Participation Required

ENERGY

Each event / function / venue brings a unique vibe, which can contribute and sometimes, dictates the outcome

Energy

Energy level of the crowd (BAD OR GOOD)

- High-energy level (often a sign of fun) – gets the crowd moving at a faster pace
- Crowd movement is very difficult to stop
- Slower music tends to slow crowds down

AISI / NFPA / Larry Potenza, CFE, CIP, CIIP
Energy - Good

DISNEY

INFORMATION

Communications, at every level and for every situation, is critical for the overall success of every venue / event.

Information

What is needed to have a successful event:
- If the event were to be cancelled, can all the appropriate personal be notified in time?
- How are you to handle disappointed crowds?
- Ticket agencies notification
- Logistics

AVSS / NFPA / Larry Petralia, CFE, CIP, CNP
METERING
A time based factor to control the arrival/departure of the crowd to avoid "bottlenecks"
Etc: stairs, narrowing corridors, corridors ticket processing, escalators, etc.

- Must be carefully applied – causes waiting
  lives on the approach
- Staff communication is a critical aspect of metering

Example: DMRT Bay Area Rapid Transit (BART) train service in California / Introduction of the 1-Phase / Disney

Now I Ask You Who is a Crowd Manager?
Break

Crowd Control

A limitation or restrictions of a group behavior
Crowd Control - maybe part of the crowd management plan

- Physical
- Permanent

Crowd Control, continue

- Temporary

Crowd Control, continue

- May occur as a reaction to a group problem
- Extreme measures to enforce order (i.e. use of force)
- Threat of personal injury or arrest

NFPA
Video Electric Daisy Carnival

crowd_control.png - people crush during the electric daisy carnival nh1.png 2760x3600.png

Crowd Control - permanent

- security bars, bollards, fencing, cement blocks, design, etc.

Crowd Control - temporary

- stanchions, bicycle racks, ropes, human/animal, staff, barricades, etc.
Techniques - physical

- Wanding
- Pat-down
- Eye-to-eye contact
- Being part of the crowd
- Law Enforcement
- Security Cameras
- Ushers
- Prevent bottle usage i.e., plastic/glass

Technique is visual

- Event (alcohol?)
- Time of Day/Year
- Celebration
- Physical appearance
- Age of crowd
- Construction
- Obstructed ingress/egress

New Technology
New Technology

Battle Prod video

yilmate.com -
infoWars_5_million_volt_cattle_prod_developed_for_crowd_control.wi
d_endPlay.mp4

4 Areas Most Dangerous During Moving Crowds (May see on test)
Ingress
How fast can I process the crowd / Is there enough room / Event area

Egress
How fast can I get occupants safely out

Celebration
When do you interject?
Protest

Peaceful or Hostile / Protecting 1st. Amendment

Some Factors for Crowd Managers & Crowd Control

Crowd Composition Attracts...

- Those who wish to enjoy the event;
- Predators in search of victims;
- Those with psychological, social and political agendas;
- Provides cover to engage in hostile or aberrant behavior or opportunity to commit crimes or failure of structural support or barricades (e.g.: drugs, pickpockets, solicitation or failure of railing or other structural support)
Crowd Psychology
Limited interpersonal communications - "Lack of front to back communications"

The Who Concert video

y2mate.com
1979 in the news_cincinnati_who_concert_wifzv1h0Cycz_360p.mp4

Crowd Categories (May see on test)
1) Critical Occupancy
2) Flight Response
3) Craze
Critical Occupancy

gradual accumulation and overloading of a pedestrian space, beginning at levels below 3 sq. ft. per person until it reaches the plan view area of the human body of about 1.3 to 1.5 sq. ft. per person.

Examples: transportation terminals, top of escalators, public events or venues where ingress and assembly are not controlled or holiday shopping fisco (Wal-Mart), escalator malfunction Emerald Sq. Mall Attleboro MA

NFPA & Paul Wertheimer

Flight Response

People are fleeing from either a real threat, such as a fire or an explosion, or a, but otherwise, non-threatening event. May also be labeled as a panic or stampede.

Examples: fire, explosion, power outage, structural failures, group altercations, police actions, severe weather conditions.

NFPA & Paul Wertheimer

Las Vegas shooting video

y2mate.com - las_vegas_shooting_O8qyQ11kWPc.360p.mp4
Craze

Is a competitive RUSH to obtain some highly valued objective. Such as:
- viewing celebrities
- entry into a popular event or establishment
- more unfortunate where supplies are being distributed in the event of a disaster
  Fatality usually occur at the points of ingress, doors, ticket collection, or other
  pedestrian elements in the path between the crowd and its intended objective are
  intertwined

Examples:
- Hillsborough Stadium, Sheffield England 1989 – (Overcrowding)
- Pearl Jam Concert, Roskilde, Denmark, 2009 (Festival Seating - Crowd Crush), 2010
- Haiti Earthquake, February 2010 (Emileau Square, Haiti)

NFPA / Paul Wertheimer

Celebrities / World Figures

Festival Seating

A form of audience / spectator accommodation in which no seating,
other than a floor or finished ground level, is provided for the
audience / spectators gathered to observe a performance.
Prohibited unless otherwise by one of the following: 1) occupant
loads of 250 or less; 2) or 250 or more and a Life Safety Evaluation
has been performed.
Festival Seating continued

Other venues have installed crowd access and safety zones along the front of the stage, with some extending the zones out into audience in “T”, “H” or “V” configuration.

With the use of real-time video displays, can provide for first hand account.

A good example is New York City Central Park Event series:
1) Each year has several events with “Festival Seating”
2) They create a 12’ aisle to divide the crowd, this provide Emergency personal access the critical areas for egressation.

Design and Planning

Let’s look at ways to effectively plan and design for crowd control and management with Festival Seating.

Design and Planning

Another design example.
Design and Planning
Most common design example.

Design and Planning
Another common design example.

Demonstration
Wedge or "V" penetration/extrication method
Crowd Management Phases
(May see on test)

Three Phases
1) Venue Design
2) Pre-event Planning
3) Event Itself

Venue Design
(Architect, Stakeholders & AHJ's)

- Circulation "Tree" Design – flow chart
- Movement Pathways – simple and direct
- Pressure Point Hazards – must be avoided
- Determine Location of Crowd Mgmt. Ctr. – max. view of venue
- Backup Standby Power – public address system must be included
- Emergency Medical Facilities – sufficient to handle routine accidents
Examples of Design - indoors

**OPEN PLAN / LITTLE OBSTRUCTIONS**

**TRADITIONAL – DIRECTION SIMPLE**

Examples of Venue Design - Outdoors

Pre-event Planning

Operational Planning – volume, pathways, crowd densities, anticipated crowd behavior, appropriate staffing

General Admission Events – should be avoided because they introduce "competition"

Staffing Levels – depends on anticipated crowd

Weather Conditions – extreme conditions either before, during and after event

NFPA
Indiana Stage Collapse

Insightful Thought?
What are some obstacles and or issues which could occur in your occupancies, which could effect the overall safe operation of your venue?

Discussion...

Examples of Operational Planning
Event Itself (May see on test)

- Communications failures are usually the major cause in all serious crowd incidents – staff constantly monitoring, CCTV, extra-large TV screens, public address system, security should be connected with the venue communications – (mixed / no message / DOPS)

Examples of Communications

**Bad**

**Good**

Safety Requirements

- Adequate Number of Exits
- Marked Exits
- Clear Exit Paths
- Doors Must Swing Out
- Panic hardware (100 people or more)
- Occupancy Posting
- Alarm System
- Emergency Lighting
- Safety Announcement
Safety Announcements
(May be on test)

NFPA 101 12/13.7.7.3* NFPA 1 20.1.4.6.3* In the following assembly occupancies, an audible announcement shall be made, or a projected image shall be shown, prior to the start of each program that notifies occupants of the location of the exits to be used in case of a fire or other emergency:
(1) Theaters
(2) Motion picture theaters
(3) Auditoriums
(4) Other similar assembly occupancies with occupant loads exceeding 300
Where there are noncontinuous programs.
12/13.7.7.4 The requirement of 12.7.7.3 shall not apply to assembly occupancies in schools where used for nonpublic events.

Safety Assessment Prior to Event

Did you check:
- Exit Signs
- Exit Doors Clear of Obstructions & Operational
- Exit Paths Clear
- Fire Alarm System Operational
- Sprinkler System Operational

Safety Assessment: Prior
- Walk the outside of the building:
- Is it adequately illuminated?
- Is it clear of obstructions?
- Is there a designated meeting place once outside?
- Are the streets clear for emergency apparatus?
Safety Assessment: During

Prevent overcrowding by:
- Monitoring the amount of people
- Walk the rooms / confirm that the exit paths are staying clear.
- Educate employees - importance of maintaining that exits
- Make this part of your corporate culture, and
- Look for challenging situations that could lead to an emergency.

Self Inspection Checklist

Some Non-Fire Emergencies that May / May not require Evacuation
Team Approach - Game Planning Process (may see on test)

- Identify planning team / input sources
- Minimum 72 hours for routine productions
- Promoter or Sponsor
- Public Safety agencies that hold a functional stake
- Pyrotechnics
- Fireworks
  - Airport
  - Military Installation
  - Water

Train in Tokyo

Advantages of Team Approach

- Sense of Ownership (more likely to follow the Plan)
- Greater Resources (knowledge and expertise likely to result in more successful event)
- Cooperative Relationships (closer professional relationships established during planning should translate into better cooperation in an emergency)
Emergency Action Plan (EAP)

A detailed plan of action for any emergency situation. "Resiliency"

Step-by-Step Guide

6 Primary Functions of an EAP

Serves six primary functions:
1. Provide life safety and protection
2. Mitigate, minimize and/or eliminate damage and harm
3. Provide for emergency preparedness, prevention, response and recovery
4. Meet and exceed mandated regulation
5. Provide clear explicit and external communication
6. Reduce liabilities and loss
Public Assembly Requirements

- The following are some public assembly requirements (this list is not all inclusive):
- Inform Public where the exits are located
- Have properly working fire alarm devices/system
- Have an evacuation plan established for every emergency situation
- Have unobstructed, well marked exits
- Train employees in crowd control techniques
- Train employees in fire extinguisher use
- Establish a meeting place

Evacuation Diagrams

At a minimum...

- Shows Occupants where all exits may be located
- Provides closest exit location from their current location

Portable Fire Extinguishers

The State Fire Marshal's Office does not advocate for fire extinguisher usage but advise the members to dial 911 and then safety evacuate the premises.

In the event that a fire extinguisher is used, the following slide will demonstrate proper usage.
Portable Fire Extinguishers  
(May see on test)

**P** – pull the pin  
**A** – at the base of the fire  
**S** – squeeze the handle  
**S** – sweep side to side

---

**Summarize**

**Planning** - the key to preventing needless tragedies. Expect the unexpected, know the crowds.  
**Think outside the box** – what could someone in the crowd do that could impact on the safety of others?  
**Training** – practicing – drilling the employees will ensure they handle their duties calmly, should a situation arise.

---

**Remember**

Compliance with codes does not ensure safe functioning of an extremely crowded venue.


---
5-Year License

State of Rhode Island and Providence Plantations
Crowd Managers License
Vincent Quinterno
Valid Thru 2022

Insightful Thought

"Great moments are born by great opportunities"
Herb Brooks, 1980 Team USA Olympic Hockey Coach

Questions.
Further Info

- vincentquinterno@gmail.com
- 401-641-3108
- Twitter: @VincenzoHf
- LinkedIn.com/in/vincentquinterno-cf-61387437
- Facebook: Vinny Quinterno

Contributing Resources

Key Note
Held of Security Today (October 2019)

International Association Assembly Managers "Building for Safety and Security"

National Fire Protection Association

National Fire Protection Association

Driving Workshop
City, State, Zip Code
City, State, Zip Code
City, State, Zip Code

vincentquinterno@gmail.com

NFPA 7 Steps to Crowd Management Planning

1) Expected number of occupants to a space
2) Groups Behavior
3) Assessment of the adequacy of assembly area
4) Means of ingress/egress
5) Processing procedures such as ticket collection & security screening
6) Staffing
7) Means of communication
Western Australia video