

Human Behavior and Fire

- Explain how conditions in the building and personal experiences influence evacuations.
- Predict how people will respond in a fire.
- Identify the effects on people from fire.



General Principles of Fire Safety

- Fire safety addresses multiple issues simultaneously
 - Prevention
 - Communication
 - Containment
 - Extinguishment
 - Escape



Main Factors Affecting Escape

- Construction
 - Type I, Type II, Type III, Type IV, Type V
- Occupants
 - Number
 - Physiological characteristics
 - Behavioral characteristics
- Building
 - Detection and alarm systems
 - Exit distribution and widths
 - Travel distances
 - Height
- Fire load
 - Volatility of contents



Individual's Behavior

- The building in which the fire occurs
 - Responsibilities
 - Time
- The appearance of the fire at the time of detection
- Method of notification
- Level of training of occupants and previous experience
- Expected actions



Effects of Fire



Decision Process

- Recognition
- Validation
- Definition
- Evaluation
- Commitment
- Reassessment



Human Behavior in Fire

- Response
 - Fight
 - Freeze
 - Flight
- Why?
 - Lack of experience
 - Perception of Risk
 - Individual characteristics
 - Physical characteristics



Factors Influencing Evacuation

- Visual access
- Familiarity
- Role and responsibility
- Position
- Commitment
- Training
 - Drills
- Frequency of nuisance alarms
- Method of notification



Method of Notification

- Smelled smoke
- Notified by others
- Shouting
- Saw smoke
- Explosion
- No power
- Heat sensed
- Fire alarm



Risk Appetite

- Risk Adverse?
 - <https://www.youtube.com/watch?v=AnfbhdELQLA>
- Risk Neutral?
- Risk Taker?
- Are these situational?
 - Family member?
 - Experience?



Hazards

- Visibility
- Heat
- Smoke
 - Asphixiants
 - Irritants
 - Low oxygen
- Time for safety
 - Incapacitation
 - Fatality
- Susceptible populations
 - Physical impairments
 - Mental impairments
 - Lack of comprehension



Effects

- Spread
 - Construction classes
 - Openings
- Hazards
 - Furnishings and finishes



The best-laid plans of mice and
men often go awry.

No matter how carefully a project is
planned, something may still go wrong
with it.



Adapted from Robert Burns poem

The best designs cannot always
force the desired behaviors let
alone control them

