Research Needs for the Fire Safety Engineering Profession

Note: Items highlighted in RED are identified as the highest priority for each thread. Items highlighted in **BOLD** are identified as the highest priority for each cell.

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TOOLS, APPLICATIONS	, AND METHODS		
Data	Innovative Technology/ Materials	Design Tools	Risk/Probabilistic Approaches
Demographics ➤ Vulnerable populations ➤ Anthropometry ➤ Cultural differences Basis for numbers in codes Response to notification	Smart egress systems Cameras Cell phones Exit usage Other LED strobes Occupant evacuation elevators	Design egress scenarios Behavior based models Cultural Pre-evacuation time Actions other than evacuating Combined fire and evacuation models	Residential buildings Large populations Community level High-challenge environments Quantify level of "life safety" in a building Effects of fire Visibility Gases Impact of public education on fire risk
Combustibility of external cladding systems Fire loads for structural fire engineering Material testing data (new materials) Effectiveness of existing/new fire safety solutions Quantification of building code performance criteria	Building information modeling Smart buildings Big data Improved test methods	Standardization of design fires and analysis approaches Best practices for retrofitting existing buildings to achieve equivalent level of safety	High-rise building design Risk-informed PBD Single family homes Risk assessment/management systems Structural FP performance

Approaches

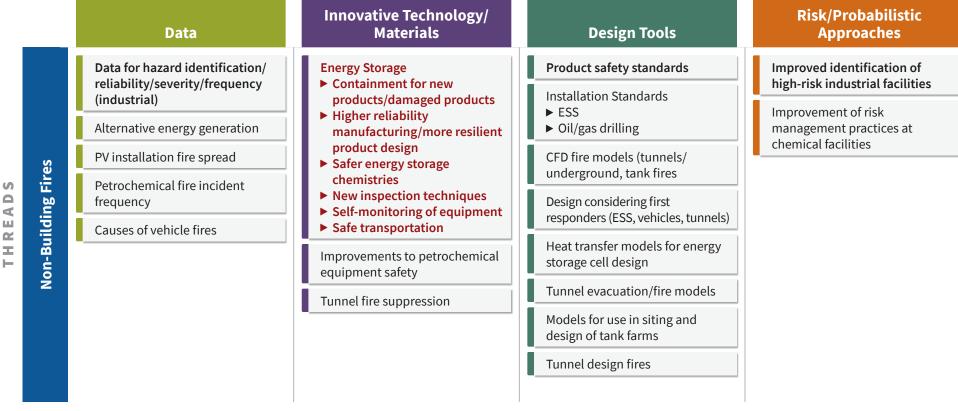
Tactics and training for emerging

technologies

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TOOLS, APPLICATIONS, AND METHODS



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LIST OF ACRONYMS

BIM - Building Information Modeling

CFD - Computational Fluid Dynamics

ESS - Emergency Storage System

FP - Fire Protection

IoT - Internet of Things

ITM - Inspection, Testing and Maintenance

LED - Light Emitting Diode

PBD - Performance-Based Design

PPE - Personal Protective Equipment

PV - Photovoltaic

WUI - Wildland Urban Interface