

AEI STRATEGY FOR MULTI-HAZARD ENGINEERING

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THE FOCUS OF ARCHITECTURAL ENGINEERING

Multiple Interacting and Interdependent Engineered Systems:

- Structure and Foundation
- Envelope
- HVAC System
- Water & Wastewater Systems
- Electrical and Lighting Systems
- Fire Detection & Suppression System

MULTIPLE HAZARDS

- Extreme events that place extraordinary demands on the building's engineered systems
- Natural: Windstorms, floods, earthquakes, etc.
- Man-made Accidental: Fire, technological accidents
- Man-made Intentional: Terrorism

HAZARDS THROUGHOUT THE BUILDING'S LIFE

- Initial stage: design or construction shortcomings
- Throughout the building's life: randomly occurring extreme events
- Near the end of useful life: corrosion, fatigue

OBJECTIVES

Design and build buildings to address all hazards throughout their lifecycle to :

- Protect the building occupants
- Protect the building and limit damage
- And increasingly, protect the building's function and maintain continuity of operations

RECENT EVENTS STRESS MULTI-HAZARD ENGINEERING

- 2004 Indian Ocean Tsunami & Sumatra Earthquake: ground shaking and tsunami wave run-up
- 2005 Hurricane Katrina: windstorm, storm surge, flood

MULTIPLE CHALLENGES (1)

- When does addressing one hazard makes things worse for mitigating another hazard?
- When does addressing one hazard helps for mitigating another hazard?
- How do we evaluate the overall reliability of a building for multiple hazards?

MULTIPLE CHALLENGES (2)

- How do the interdependencies among systems affect reliability?
- What methodologies are available for quantitative risk assessment?
- What are the implications for codes and standards, and for design practice?

AEI STRATEGY

DISASTER RESILIENCE OF ARCHITECTURAL ENGINEERING SYSTEMS IS OF STRATEGIC IMPORTANCE FOR AEI

AEI is committed to advancing multi-hazard engineering knowledge in order to provide the basis for the design and construction of buildings that meet the objectives stated earlier through:

- Technical committees activities
- Standard development activities
- Special publications and events

AEI'S EXPECTATIONS

- Obtain solid answers to some of the above questions
- Lay the foundation for updated codes and standards
- Promote a multi-hazard approach for the design of architectural engineering systems