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# Organizational and Societal Considerations for Performance-Based Earthquake Engineering

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# Appealing Aspects of PBEE

- Making seismic choices more transparent
- Allowing seismic choices to match different circumstances

# This Requires Thinking About...

- Diversity of organizational situations and choices
  - And, relevant performance metrics
- Societal consideration of relevant minimum standards
  - And, relevant processes for gauging these

# Lessons from Case Illustrations of Organizational Choices

- Minimum is protection of life-safety
- Multiple categories of performance are used:
  - Danger for life-safety;
  - Potential for significant damage and repair time;
  - Damage to contents of buildings and systems;
  - Operational use of a facility
- Also relevant are the secondary effects of earthquakes for facility operations

# Lessons About Individual Decision-Making – The Literature

- Biases and heuristics in decision-making – shortcuts to making decisions
- Difficulties Evaluating Probabilities
- Myopic Decision-Making
- Desire to Preserve Options

# Lessons About Organizational Decision-Making – The Literature

- Survivability and affordability are guiding heuristics
- Organizational hierarchy matters
- Organizations discount engineering expertise



# Implications: Three Styles of Decision Making

- Risk and Safety as By-Products of Design Decisions
- Investment-Based Decisions
- Performance-Optimized Decisions

# Thinking About Societal Perspectives

- Differences in public versus private risks
  - Limited attention to public risks
  - Collective action problems in addressing them
- Externalities – effects beyond single structures
- Interdependencies – social fabric of community



# Evaluating Societal Risks and Benefits

- Public concern is a poor guide to societal risk
- Loss estimation is an imperfect guide to societal risk
- Other considerations are important to consider – e.g., equity

# The Fallacy of “Acceptable Risk”

## Questions to Consider

- Is acceptable risk a meaningful concept?
  - It is a problematic concept
- Can acceptable levels of risk be established?
  - At best, with much difficulty
- Are public officials willing to talk about this?
  - Unacceptable costs as key concern

# Toward a New Framework: Framing Decisions About Individual Facilities

- Allow for consideration of different dimensions of safety:
  - Public safety
  - Reparability of structure
  - Usability of structure
- Expose consequences and tradeoffs
- Express safety improvements in relative terms

# Toward a New Framework: Framing Societal Decisions

- Change the language to “Safety Goals”
- Expose consequences of different safety goals
- Relate to different levels of decision-making
- Inspire confidence in the approach