GUIDING PRINCIPLES FOR THE NATION’S CRITICAL INFRASTRUCTURE

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Critical Infrastructure\textsuperscript{1}

Includes systems, facilities, and assets so vital that their destruction or incapacitation would have a debilitating impact on national security, the economy or public health, safety, or welfare.\textsuperscript{1} ASCE Definition
Critical Infrastructure

Includes -

- **Built** - structures, energy, water, transportation, and communication systems
- **Natural** - surface or ground water resources
- **Virtual** - cyber, electronic data and information systems
Task Committee Charge

Produce a Guidance Document to ensure quality in planning, design, construction, and operation of critical infrastructure, with focus on systems that:

- cross geographic, political, cultural, and organizational boundaries;
- are complex and interdependent;
- have long durations of construction and operation.
Overarching Principle

The design, construction, operation, and maintenance of critical infrastructure systems must hold paramount the safety, health, and welfare of the public it serves or affects.
Guiding Principles

1. Quantify, communicate, and manage risk
2. Employ an integrated systems approach
3. Exercise sound leadership, management, and stewardship in decision-making processes
4. Adapt critical infrastructure in response to dynamic conditions and practice
Application of the Guiding Principles

1. Supplements changes in the engineering and construction fields

   • Provides specific guidance for a key area
     – Critical Infrastructure
   • Supports the ASCE Vision 2025

   • Supports USACE Building a Stronger Corps
Application of the Guiding Principles (cont.)

2. Supplements ASCE Report Card for America’s Infrastructure
   - Provides guidelines for increased efficiency and effectiveness in providing infrastructure
3. Target audience includes elected officials, regulators, owners, constructors, end users, and affected public-at-large ... in addition to design and construction professionals

4. Serves as an introduction for decision makers and stakeholders involved with complex infrastructure, but unfamiliar with the process

  • Can serve as an effective educational tool
Application of the Guiding Principles (cont.)

5. Provides a “guide” for internal review and external assessment of an organization’s ability to provide effective critical infrastructure systems

- Use to proactively prevent or mitigate infrastructure issues
- Can be used as a basis for forensic analysis
Questions?
Guiding Principles Evolution

- Hurricane Katrina (Aug 2005)
- USACE Interagency Performance Evaluation Taskforce (IPET)
- ASCE Engineering Review Panel (ERP)
- ASCE Post-Hurricane Katrina Task Committee
- ASCE Guiding Principles Summit
- ASCE Technical Activities
1. Quantify, communicate, and manage risk

- In recognition of uncertainties in analysis, risk based analyses are being applied to:
  - Inform on relative level of safety and performance of infrastructure
  - Provide a mechanism to reflect changing risk over time
  - Involve stakeholders, owners, and engineers in the discussion about adequacy of infrastructure
2. Employ an integrated systems approach

• Consider projects within the context of other interrelated projects

• Challenges
  – Interrelated projects may be in different jurisdictions
  – Projects not planned or funded to address interrelated project issues

• Solutions
  – Planning within a systems context
  – Life cycle systems management
3. Exercise sound leadership, management, and stewardship in decision-making processes

- Apply well reasoned, technically sound decisions within a political context
  - Decision makers need access and good communication with project engineers
  - Project engineers must communicate sound advice

- Make decisions at the appropriate level within an organization
  - Some decisions should be made at lower levels because they require a high level of technical coordination
4. Adapt critical infrastructure in response to dynamic conditions and practice

• Critical Infrastructure may last many decades
• Over time the failure risk will change
  – Increased understanding of science and engineering provides more refined probabilities of failure
  – Population growth and other development can change consequences of failure
• An infrastructure organization must find ways to identify & address changed conditions
Recommendations for Design Professionals

Encourage the use of the Guiding Principles when:

– discussing infrastructure policy and authorizations with members of Congress
– working with Federal, state, and local organizations
– formulating external assessments, peer reviews, and forensic investigations
– developing strategic planning initiatives
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