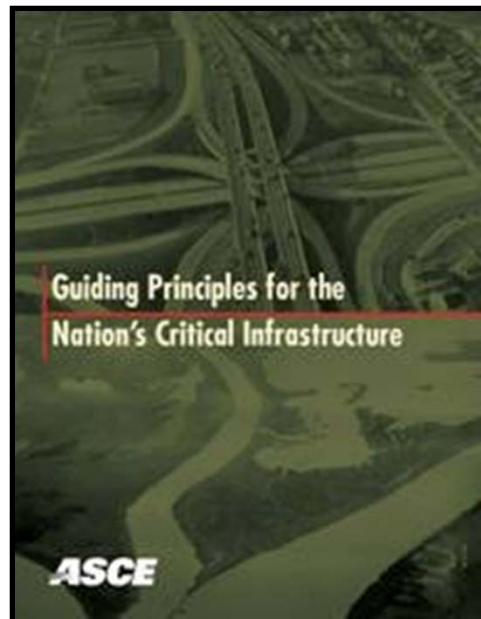


GUIDING PRINCIPLES FOR THE NATION'S CRITICAL INFRASTRUCTURE



Joe Manous

Joe.Manous@usace.army.mil

www.asce.org

Critical Infrastructure¹

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 .

¹ASCE Definition

Critical Infrastructure

Includes -

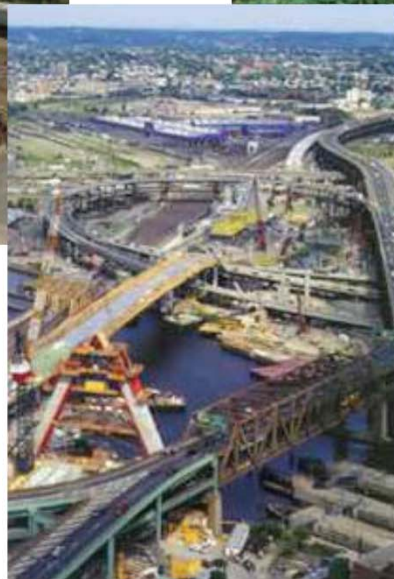
- **Built** - structures, energy, water, transportation, and communication systems
- **Natural** - surface or ground water resources
- **Virtual** - cyber, electronic data and information systems



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.**

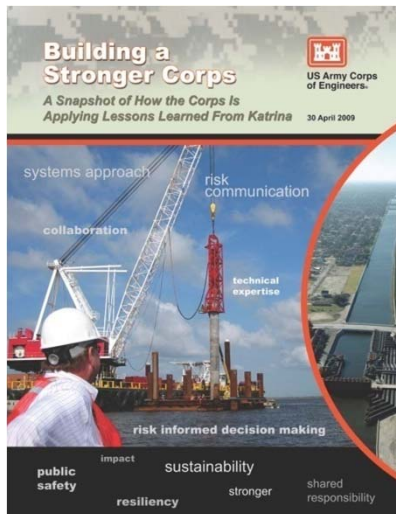
Guiding Principles

- 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



Application of the Guiding Principles (cont.)

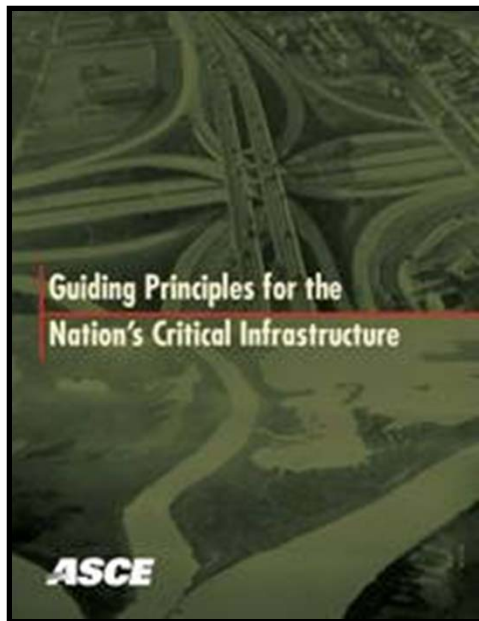
3. Target audience includes elected officials, regulators, owners, constructors, end users, and affected public-at-large ... in addition to design and construction professionals
4. Serves as an introduction for decision makers and stakeholders involved with complex infrastructure, but unfamiliar with 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

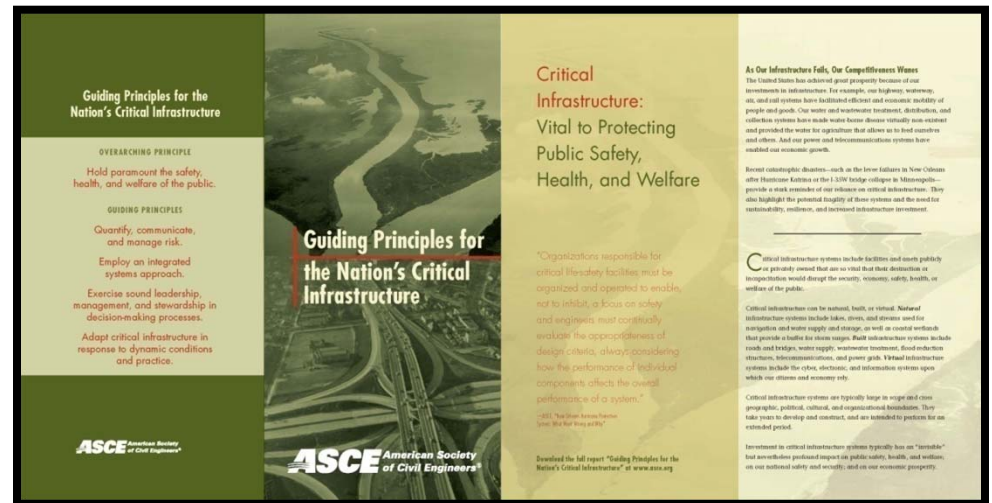
Contacts

Joe Manous, US Army Corps of Engineers, Joe.Manous@usace.army.mil
Catherine Tehan, ASCE, ctehan@asce.org



Book

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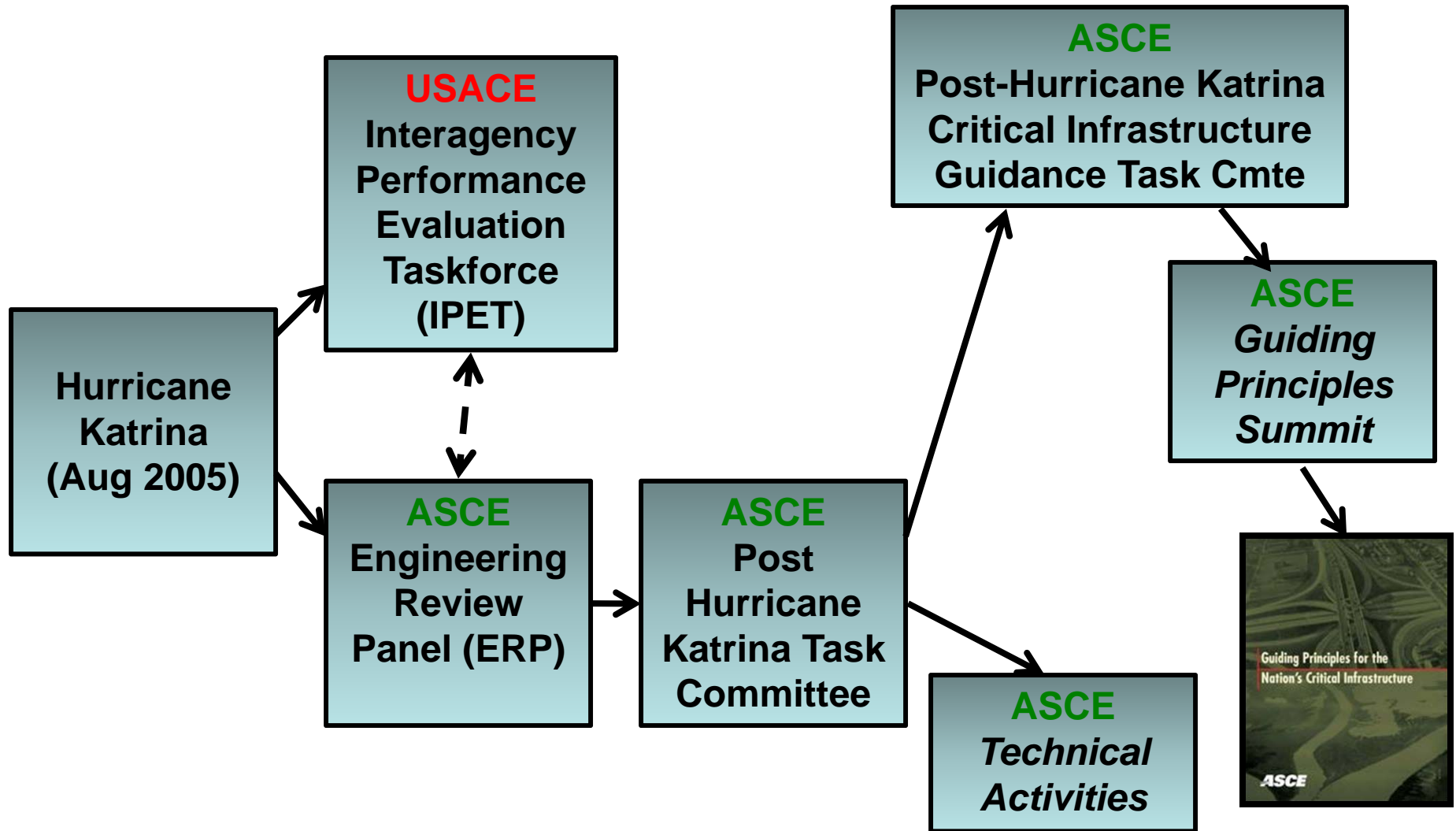
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Questions?



Guiding Principles Evolution



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**

ASCE CIG TC Members

- Donald Basham, *P.E., M.ASCE*
- William F. Brumund, *Ph.D., P.E., D.GE, F.ASCE*
- Marla Dalton, *P.E., M.ASCE*
- Gerald E. Galloway, Jr., *Ph.D., P.E., Hon.D.WRE, Dist M. ASCE*
- Robert B. Gilbert, *Ph.D., P.E., M.ASCE*
- Sybil E. Hatch, *P.E., M.ASCE*
- Andrew W. Herrmann, *P.E., F.ASCE*
- Dominic Izzo, *P.E., F.ASCE*
- Lewis E. Link, *Ph.D., M.ASCE*
- Joe D. Manous, Jr., *Ph.D., P.E., D.WRE, F.ASCE*
- Karen L. Moran, *P.E., M.ASCE*
- Lawrence H. Roth, *P.E., G.E., D.GE, F.ASCE*
- Ronald E. Smith, *Ph.D., P.E., D.GE, M.ASCE*