



# Port Resiliency Planning

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# What is Resilience?

- Resilience is the capacity of an individual, community or system to adapt in order to sustain an acceptable level of function, structure, and identity.\*



U.S. Navy photo by Chief Mass Com-mu-ni-ca-tion Spe-cial-ist Daniel C. Pearson/Released

\* DEMOS Resilient Nation,(2009) <http://www.demos.co.uk/projects/resilientnation>



# Resiliency Definitions

- The ability to *resist, absorb, recover from, or successfully adapt to adversity or a change in conditions.*
- The *ability of systems, infrastructures, government, business, and citizenry to resist, absorb, recover from, or adapt to an adverse occurrence that may cause harm, destruction, or loss of national significance.*
- The *capacity of an organization to recognize threats and hazards and make adjustments that will improve future protection efforts and risk reduction measures.*

Source: DHS Risk Lexicon



# Establishing Resilience

- Knowledge
  - Understanding Systems, Functions, and Interdependencies
  - Understanding Roles, Responsibilities and Authorities
  - Understanding Process and Structures
- Designing/ Building Resilient Structures & Capabilities
  - Infrastructure, Equipment, Hardware
  - System Functionality
  - Plans, Procedures, Relationships
  - Resources
  - Emergency Capability
  - Reserve Capacity
  - Restore/Rebuild Capability
- Tests/Rehearsals/After-Action Measures

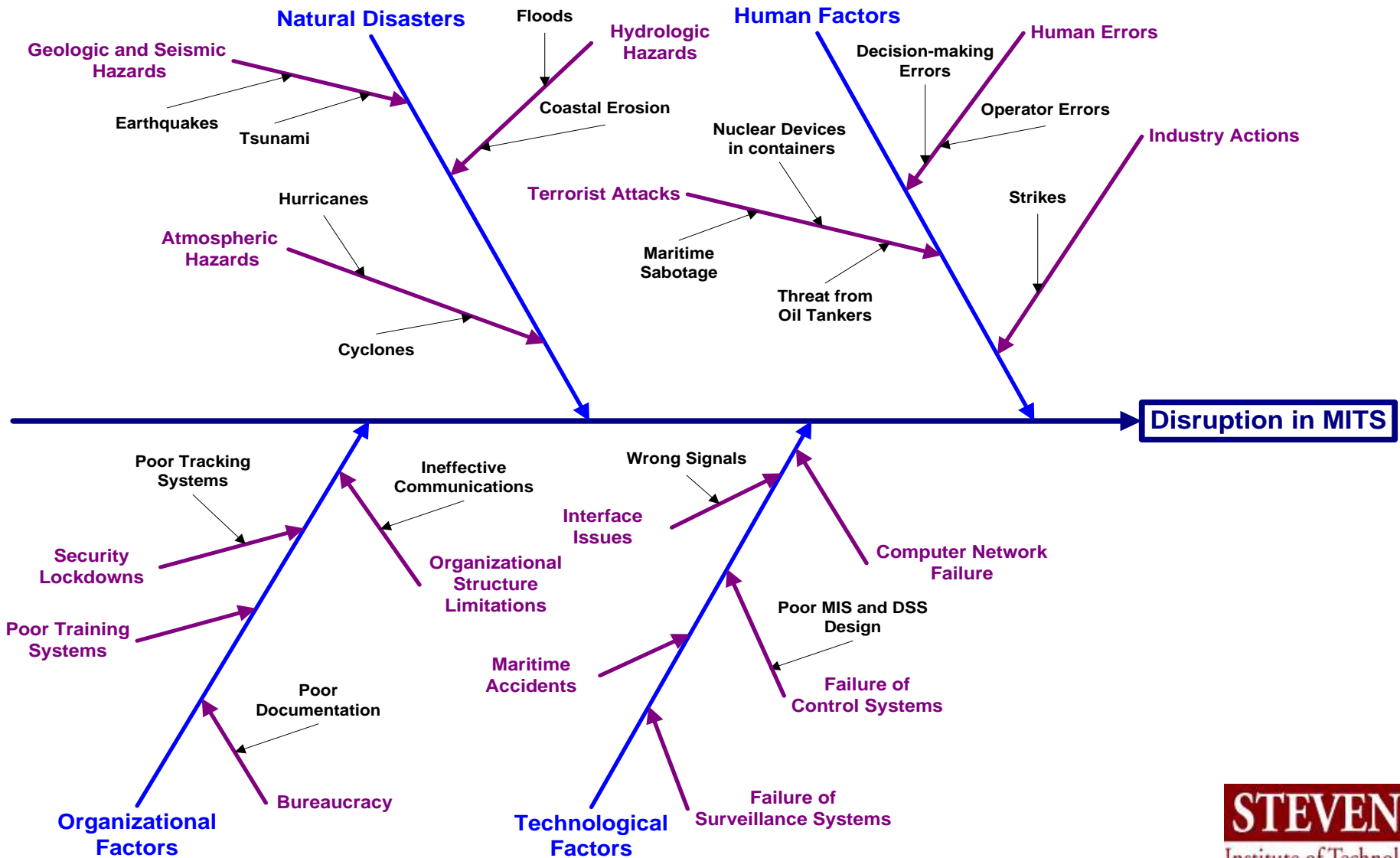


# Adverse Events

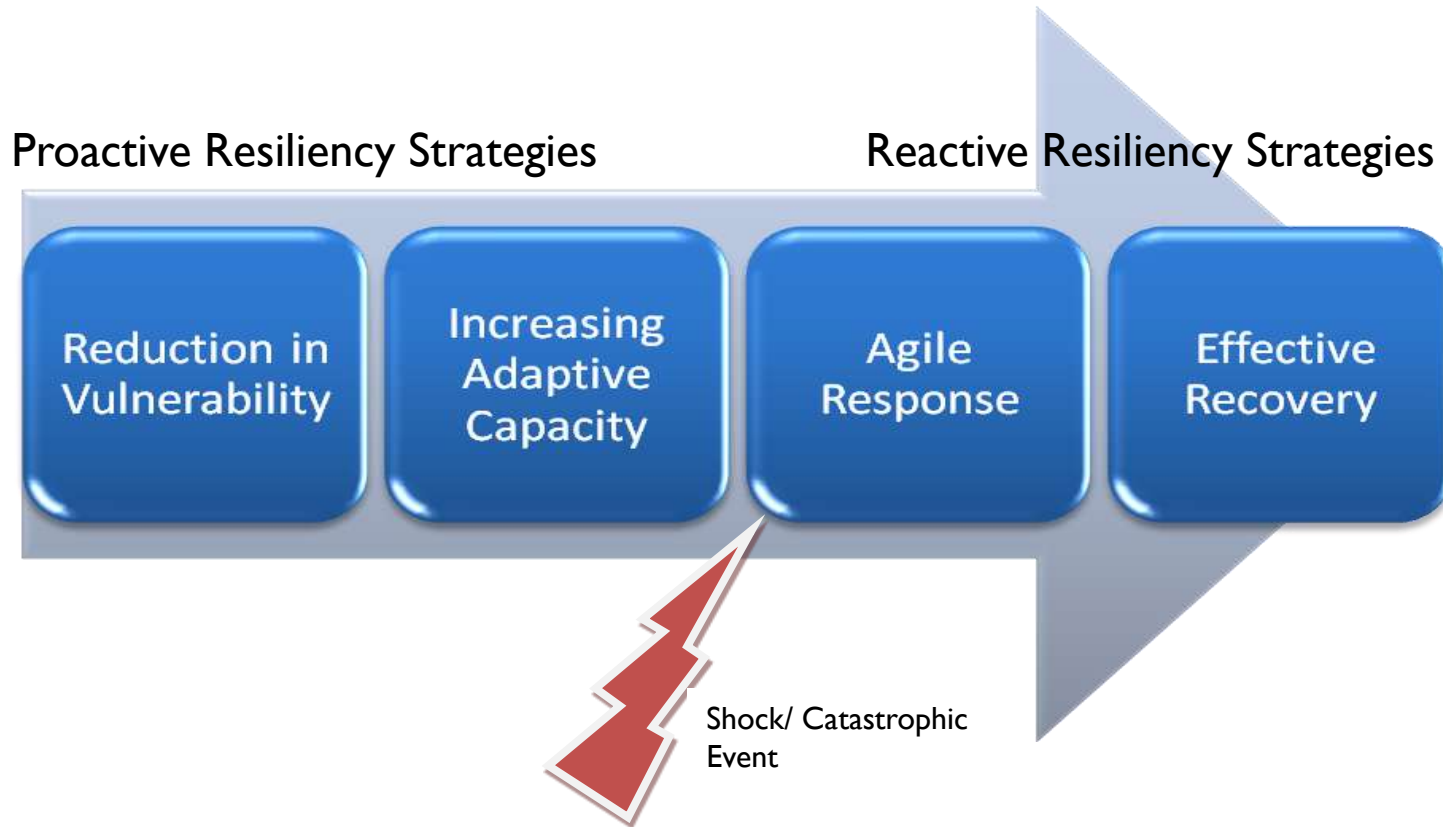
- Bridge collapse
- Equipment failure
- Vessel bomb
- Chemical tank failure
- Vessel accident
- Channel blockage
- Hurricanes
- Tsunami
- Earthquake
- Labor actions
- Terror attack
- Fire



# Threats Analysis for Port Infrastructure



# Resiliency Strategies



# Ports – Failure Nodes?

- Marine Transportation System is Intermodal
  - Roads
  - Rail
  - Vessels
  - Waterfront facilities
  - System users
- Ports are the focal node



Source: U.S. Department of Transportation, Maritime Administration, 2009



# Resiliency Plan

- Preparedness
- Protection
- Response
- Recovery
- Command and Control
- Personnel
- Financial
- Operational
- Communications
- Risk Management

*From a disaster recovery perspective, Hurricane Katrina provided the Port of New Orleans, and indeed all of neighbors on the U.S. Gulf Coast, with a unique, though unfortunate, opportunity to learn the value of preparing ahead for the return to business after a devastating event.*

**Paul Zimmerman, Director  
Board of Commissioners of the Port of New Orleans**



# Resiliency Plan Objectives

- Mitigate impacts of event
- Providing a focus for incident management
- Identification of resources
- Prioritization of recovery effort
  - Infrastructure
  - Cargo streams
  - Salvage/debris removal
- Expedite return to pre-incident operational levels



# Resiliency Planning Steps\*

## Assessing Vulnerabilities:

- Step 1: Identify the critical vulnerabilities of the infrastructure system
- Step 2: Select one or more of these vulnerabilities based on the stake holders priorities
- Step 3: Find the risk profile and the probability distribution of the selected potential disruptions

## Devising Resilience Strategies:

- Step 4: Brainstorm and generate a set of solutions and/or strategies that can possibly increase the resilience of the MITS
- Step 5: Identify the costs associated with each suggested solution and/or strategies

## Valuing Investment Strategies:

- Step 6: Calculate the expected value of each strategy base on the data on risk profile of the disruptive event and the cost of the strategy using DTA or real options
- Step 7: create a trade space of the strategies for the decision makers

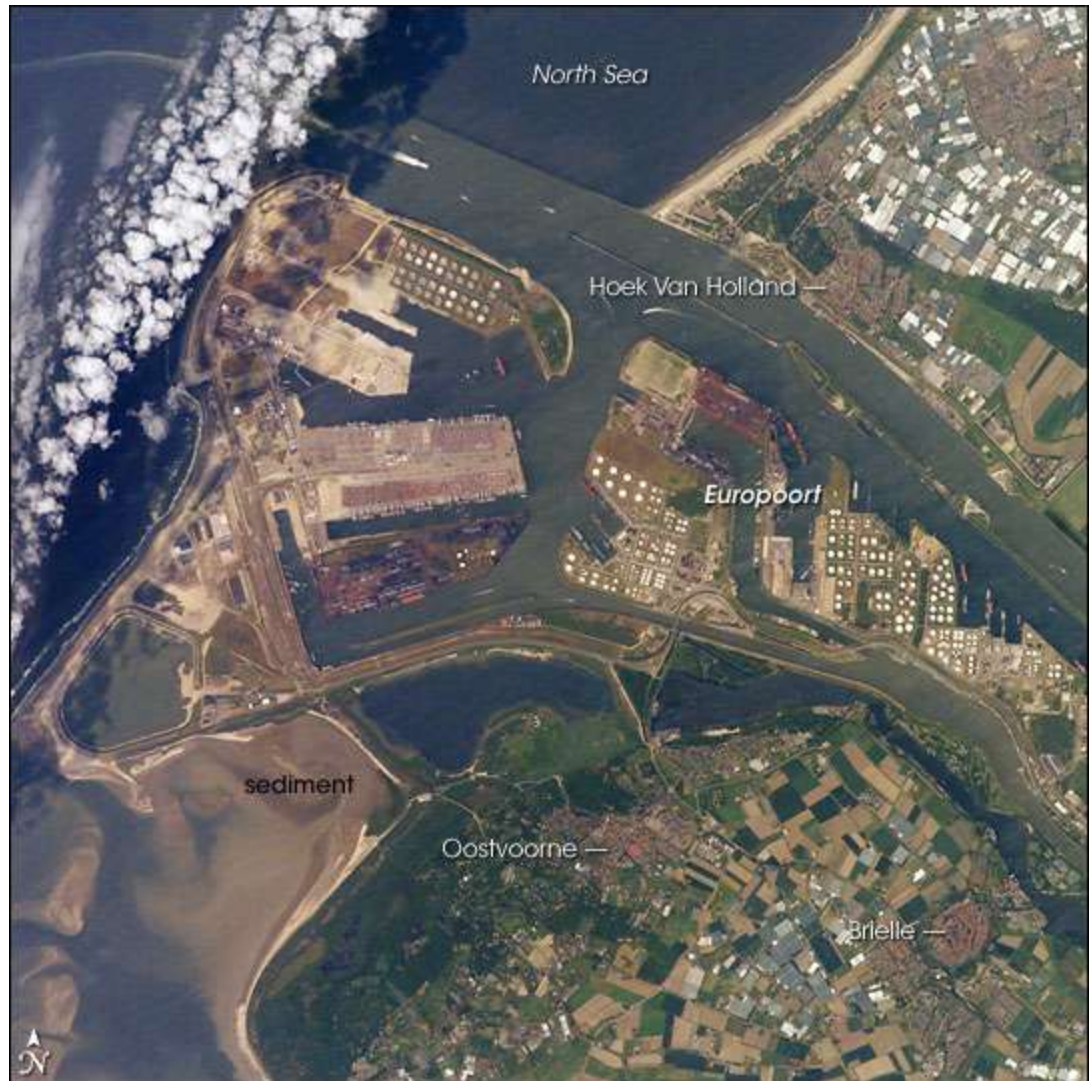
\*AASHTO (2009)

[http://www.transportation.org/sites/security/docs/12\\_resiliency\\_planning\\_port\\_security\\_emphasis.pdf](http://www.transportation.org/sites/security/docs/12_resiliency_planning_port_security_emphasis.pdf)



# Assessing Vulnerabilities

- Resources you control
- Resources others control
- Resources that impact operations
  - Prioritized
  - Key assets



# Devise Resilience Strategies

- Repair or replace damaged infrastructure needed to resume commerce
- Reestablish system confidence through application of security/safety procedures
- Work as team to adjust cargo/commerce distribution schemes
- Manage risk to minimize disruption and maximize commerce



# Resiliency Benefits Ports <sup>1</sup>

- **New Orleans (2005)**

- Aug 29 Katrina inflicts \$1B damage to Port
- Sep 13, M.V. Lykes Flyer is out loaded
- Feb 17, Port reports reaching pre-Katrina level
  - Rapid federal support – MARAD provided ships for housing workers
  - Augmented with work force from other ports
  - The Port didn't have a continuity plan – they do now!

<sup>1</sup> Dr. Terry Egan, (n.d.) [www.washingtonports.org/member\\_resources/.../egan.ppt](http://www.washingtonports.org/member_resources/.../egan.ppt)



# Lack of Resiliency Impacts Ports <sup>1</sup>

- Kobe, Japan (1995)
  - Electric power and telecommunications were reestablished within the first couple of weeks
  - Water and natural gas within 3-4 months
  - Rail and highway networks were not completely restored until 7 and 21 months after the earthquake, respectively,
  - The Port of Kobe required somewhat over 2 years to complete repairs.
  - Even in 1998, 3 years after the disaster, cargo traffic remained at roughly half of pre-disaster levels.



# Future Actions

- **Develop/Improve Short-term Recovery Plans and Procedures**
- **Develop/Improve Short-term Recovery Capabilities:**
  - Identify Core and Specialty Professional Competencies and Training Needs
  - Provide for Professional Development of MTS Recovery Cadre
  - Identify, Disseminate, Institutionalize Best Practices
- **Develop/Improve Understanding of CIKR Infrastructure & Supply Chain:**
  - Dependencies
  - Interdependencies
- **Develop Economic Values Pre-incident**
- **Develop/Improve Tools and Job Aids**







# Questions?

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