National Transportation Safety Board

# Creating a Culture of Safety: Challenges and Opportunities

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Board Member

American Waterways Organization
Coastal and Interregion Safety Committees
Joint Annual Meeting
January 15, 2014

**1) determining the probable cause of transportation accidents**

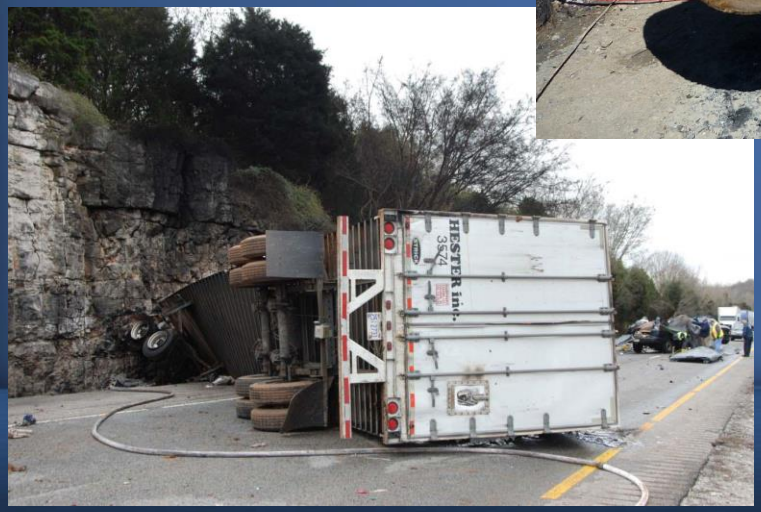
**2) making recommendations to prevent their recurrence**

METROLINK
625
METROLINK
UNION PACIFIC

American

# All Modes

THE RESOURCE
Ride the Duck


HESTER Inc.
3574

# NTSB Go Team: 24/7/365

- Individual investigator
- Regional/limited team
- Major launch/Board Member

# Key On-scene Events

**Organizational Meeting**

- Designate parties and party coordinators
- Establish and organize groups

**Progress Meetings**

- Summarize findings
- Info for briefings

**Family Briefings**

**Press Briefings**

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# NTSB Party System

- NTSB selects parties
  (No insurers, claimants, lawyers)
- Bound by rules of engagement
  (Responsive to NTSB direction)
- Verify factual reports written by group chairmen

*"…persons, government agencies, companies, and associations whose employees, functions, activities, or products were involved in the accident and who can provide **suitable qualified technical personnel** to actively assist…"*

Party Member Examples

- FAA (always)
- Equipment manufacturer
- Engine manufacturer
- Airline Pilots Association
- Air Traffic Controllers Union

# NTSB Investigative Process

## On-scene Investigation

- Organizational Meeting
- Groups and Parties
- Progress meetings
- Media Briefings
- Press Releases

## Preliminary Report

- Factual information

## Public Hearing

- Fact finding
- Depositions
- Witnesses
- Docket

## Board Meeting

- Docket
- Findings
- Conclusions
- Probable Cause
- Safety Recommendations

## Final Report

***Government in the Sunshine Act***

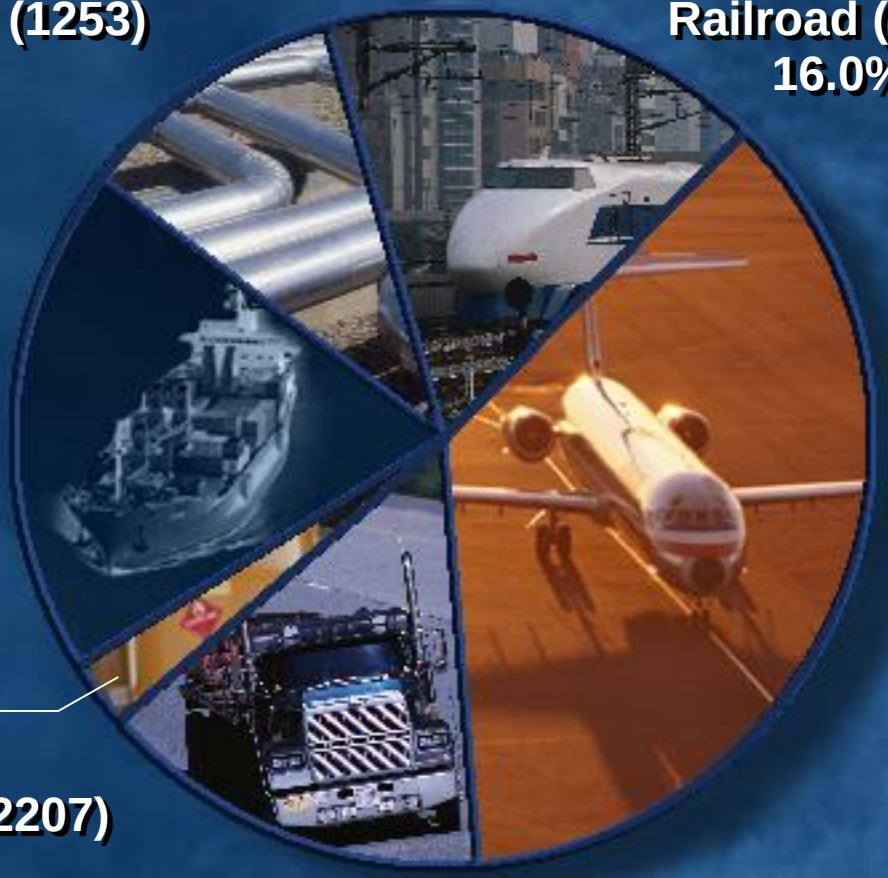
# Party Participation

- Written party agreement: roles and responsibilities
- Support collection of factual information
- Questions, concerns, issues
- Party submission
- Board Member meetings
- Accident Board Meeting

# Independent Federal Agency: Created in 1967

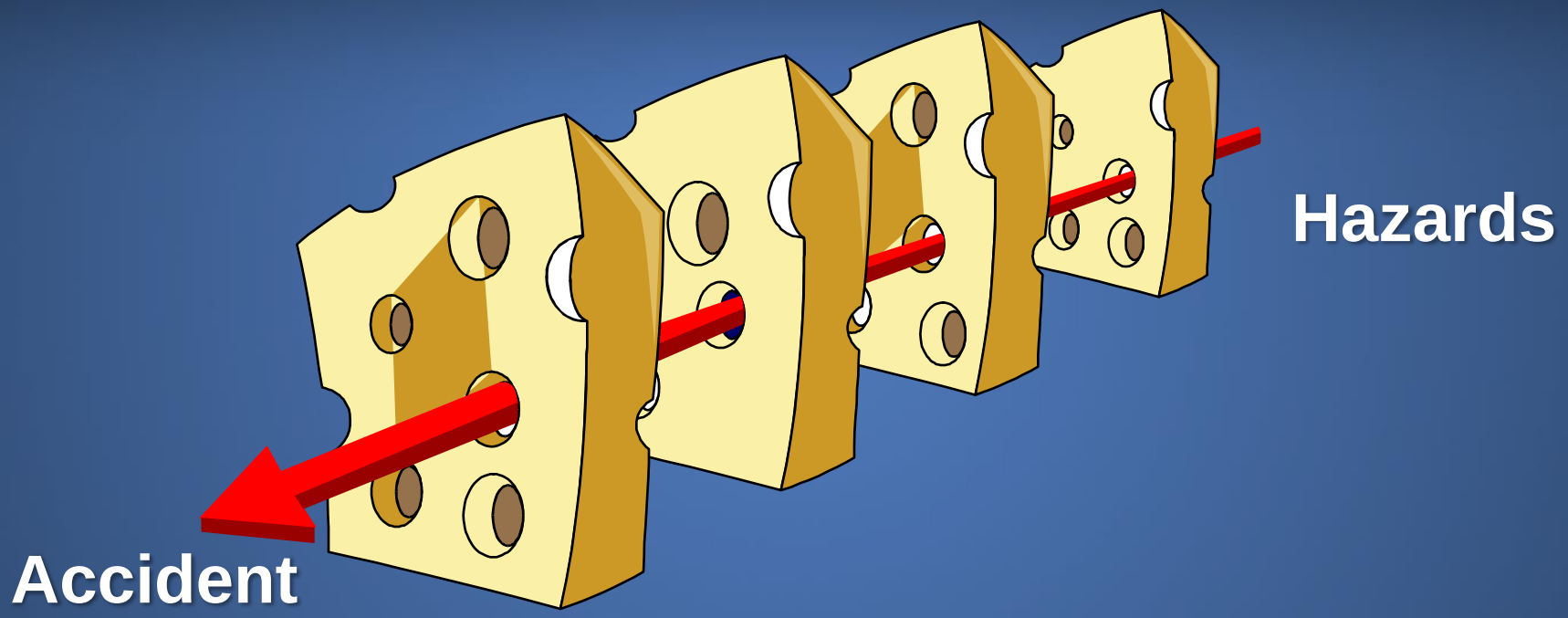
- >132,000 accident investigations
- 13,500+ safety recommendations
- ~ 2,500 organizations/recipients
- 82% acceptance rate

# 13,454 Safety Recommendations issued since 1967




Rev: July 1, 2011

# “Swiss Cheese” Model (Reason)




Successive layers of defenses, barriers, and safeguards

# NTSB Characterized as:

‘moral compass and industry conscience’

NTSB Chairman Deborah A.P. Hersman

# Honorable John K. Lauber:

No Accident ≠
Safe Operation

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Collision of Two Washington Metropolitan Area Transit Authority Metrorail Trains Near Fort Totten Station
Washington, D.C.
June 22, 2009

**Railroad Accident Report**

NTSB/RAR-10/02
PB2010-916302

**National Transportation Safety Board**

# WMATA Metrorail Accident

- June 22, 2009
- Near Ft. Totten station
- Two Metrorail trains collided
- Nine fatalities, 52 injuries
- $12 million in damages

M
metro
NTSB

# Probable Cause

- Failure of track circuit modules
- Failure to ensure use of a track circuit verification test developed following near-collisions in 2005
- Contributing factor: lack of a safety culture

# Ineffective Safety Culture Identified

- GM did not provide adequate information about critical safety issues
- Board of Directors did not seek information about critical safety issues
- Board of Directors did not exercise oversight responsibility for system safety
- Organizational structure did not ensure effective communication
- Failed to recognize previous near-collisions as unacceptable hazards
- Management focus influenced employee behaviors
- Low priority on addressing train control system malfunctions

Enbridge Incorporated
Hazardous Liquid Pipeline Rupture and Release
Marshall, Michigan
July 25, 2010

**Accident Report**

NTSB/PAR-12/01
PB2012-916501

**National Transportation Safety Board**

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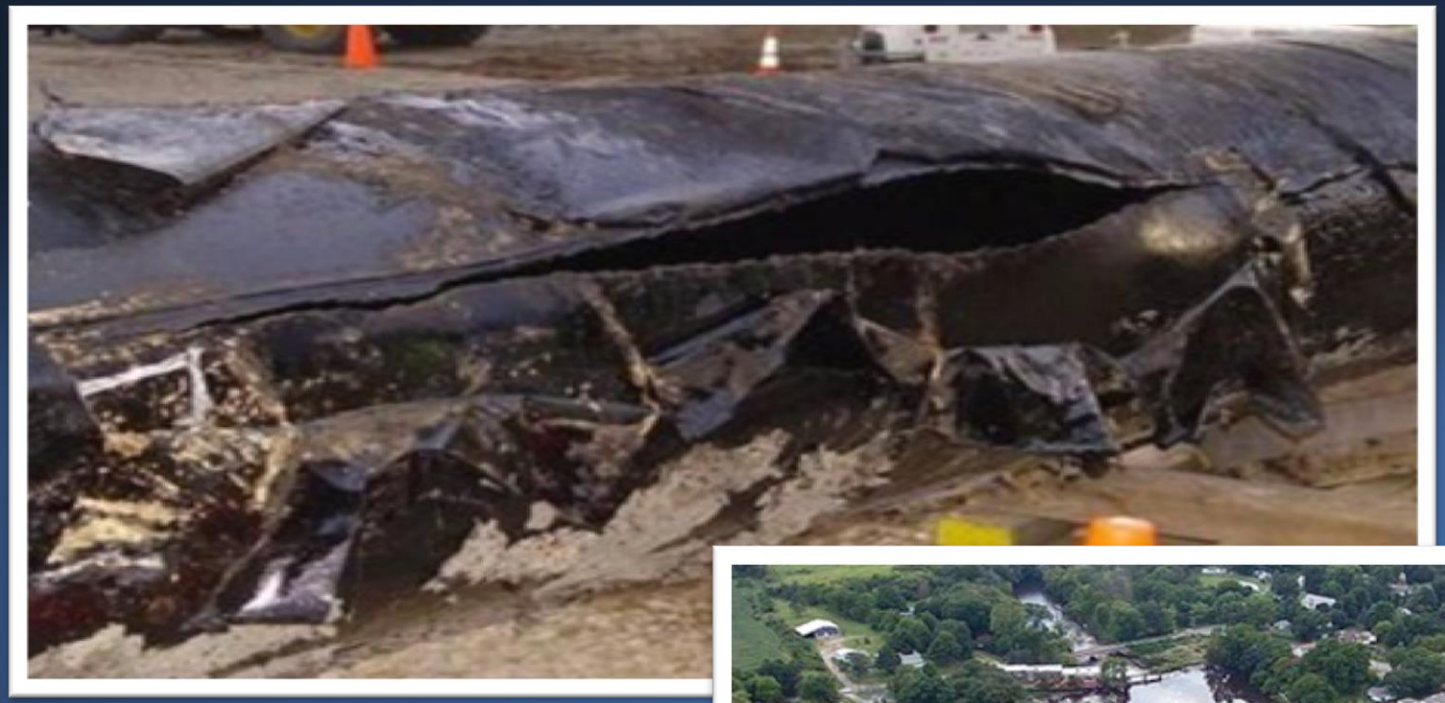
# Enbridge Pipeline Rupture Accident

- July 25, 2010
- Marshall, Michigan
- 6 ft, 8 in pipeline rupture
- Released 843,444 gal of crude oil into critical wetlands
- Cleanup ongoing > $767 million



NOTICE
NO RIVER USE
UNTIL FURTHER NOTICE
DUE TO ONGOING
OIL SPILL RESPONSE
DNRE
For more information, please call
Enbridge toll free 1-800-306-6837

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# Probable Cause

"…corrosion fatigue cracks that grew and coalesced…producing a substantial crude oil release that went undetected by the control center for over 17 hours. The rupture and prolonged release were made possible by pervasive organizational failures at Enbridge."

# Organizational Failures Identified

- Less than conservative integrity model
- Did not incorporate lessons learned
- Control Center lacked technical leadership
- Poorly defined Control Center roles
- No Control Center team training
- Tolerance to procedural violations
- Relied on the absence of external notifications
- Control Center punitive environment
- Public awareness deficiencies not addressed
- Environmental response plan inadequate
- Inadequate SMS

Motorcoach Run-Off-the-Road and Collision
With Vertical Highway Signpost
Interstate 95 Southbound
New York City, New York
March 12, 2011

**Accident Report**

NTSB/HAR-12/01
PB2012-916201

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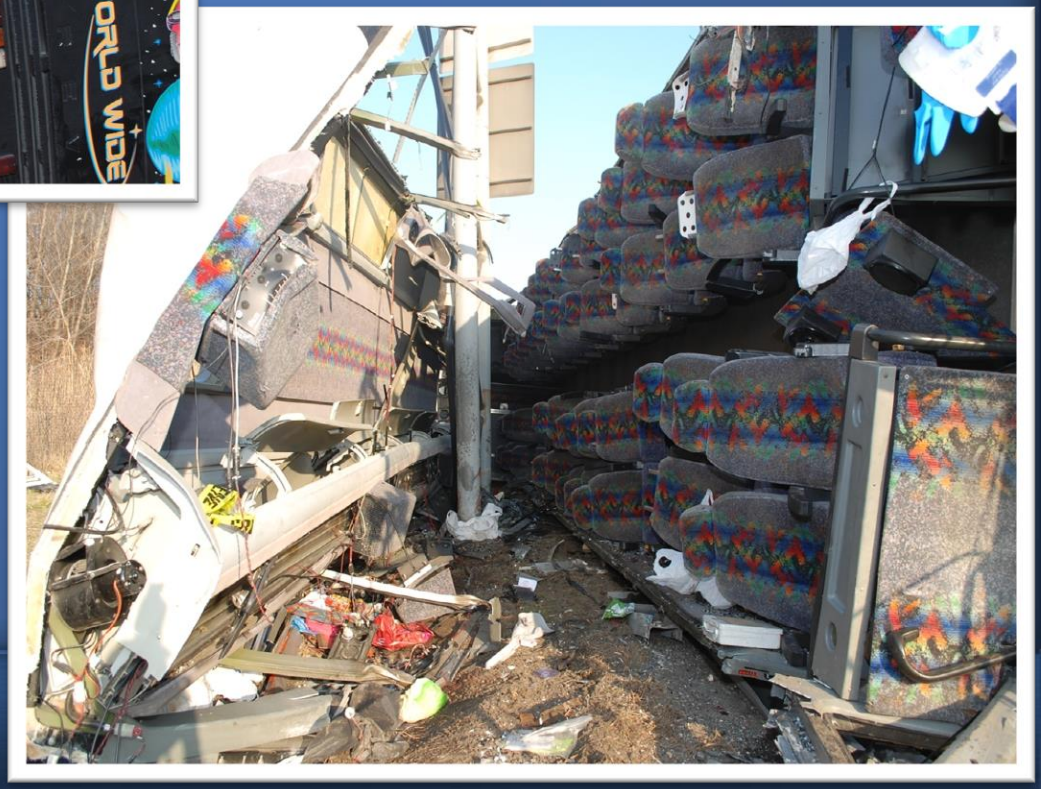
# ‘Bronx Bus’, New York, NY (March 12, 2011)



15 fatalities

17 injuries

# Probable Cause/Contributing Factors

- "…the motorcoach driver's failure to control the motorcoach due to fatigue…"
- "Contributing to the accident was inadequate safety oversight of the accident driver by [its] management*…a corporate culture that fostered indifference to passenger safety*."

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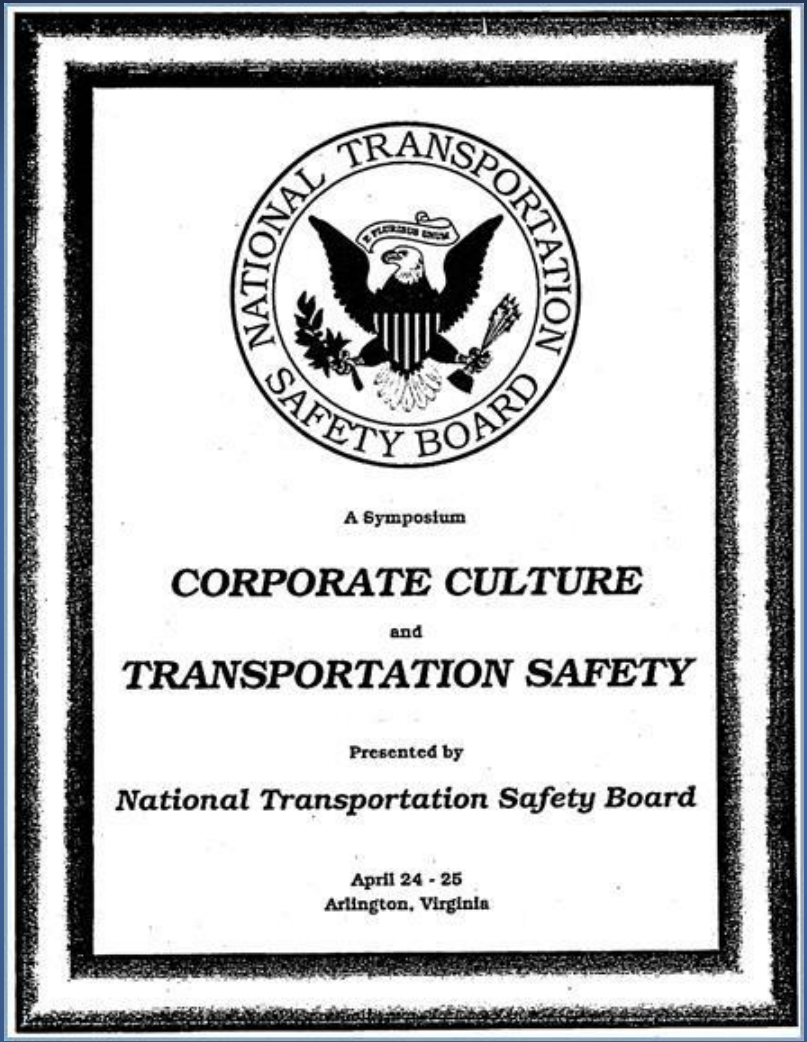
# 1997 NTSB Corporate Culture Symposium



A Symposium

**CORPORATE CULTURE**

and

**TRANSPORTATION SAFETY**

Presented by

***National Transportation Safety Board***

April 24 - 25
Arlington, Virginia

# “Safety Culture”

- What is it?
- How is it created?
- How to measure it?

# September 10-11, 2013

The forum will address ways of enhancing safety by providing first-hand accounts of efforts from both transportation and non-transportation industries to develop effective safety cultures and to implement specific safety-enhancement techniques.

www.ntsb.gov

# Agenda included

- NTSB review of accidents: ‘safety culture’ issues
- Methods to create/improve safety culture
- Managing safety culture and oversight in transportation
- Non-transportation perspectives
- Review of safety culture research
- Company experiences

# What is Safety Culture?

- Definitions and approaches vary widely:
  - safety culture, safety climate, organizational safety, high-reliability organizations, resilience, and more
- More than human error or equipment
- Pervasive but can be hidden/elusive/amorphous
- Attitudes, norms, shared understanding

# What is Safety Culture?

- "Culture" is neutral and "safety" is normative
- Different definitions and approaches used to measure and manage:
  - qualitative assessment
  - quantitative measures
  - expert opinion

# Process Versus Personal Safety

- There is a difference between process safety and personal safety; important, often misunderstood
- Workplace injuries:
  slips, trips and falls = personal safety
- Attitude surveys may be indicative of personal safety
- “Safety culture” label applied to personal safety and attitude surveys

# Effective Approaches (Identified by Participants)

- A shared understanding of safety risks
- Reporting systems
  - voluntary, non-punitive reporting systems
  - incident and close-call reports
  - recorded operational data
- Requires mechanisms, policies, and expertise
  - collect, interpret, share, and act on information

# Effective Approaches (Identified by Participants)

- Companies anecdotally reported benefits from:
  - personnel selection and training
  - reporting systems
  - operational data monitoring
  - safety reviews and audits
  - employee/management communication

# Non-effective Approaches (Identified by Participants)

- General consensus: safety culture cannot be mandated
- Researchers and companies suggest regulators: focus on risk management functions
- Concerns that safety systems can be easily damaged: need for “trust”, “integrity”, “fairness”
- Threat of punitive action can be motivating . . . but not sustainable

# Safety Culture Forum Information

- Forum agenda, speaker bios, and presentations

http://www.ntsb.gov/news/events/2013/safetyculture/index.html

- Archived webcast

http://stream.capitolconnection.org/capcon/ntsb/ntsb.htm

- Public docket

http://dms.ntsb.gov/pubdms/search/hitlist.cfm?docketID=55256

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# Safety Culture Matters

- Safety ‘traits’ are associated with enhanced safety outcomes
- Individual, operational, organizational level changes

# Nuclear Regulatory Commission (NRC): Safety Culture Definition

*the core values and behaviors resulting from a collective commitment by leaders and individuals to emphasize safety over competing goals to ensure protection of people and the environment*

# Nuclear Regulatory Commission (NRC): Traits of a Positive Safety Culture

Questioning Attitude

Work Processes

Problem Identification and Resolution

Continuous Learning

Environment for Raising Concerns

Respectful Work Environment

Effective Safety Communication

Personal Accountability

Leadership Safety Values and Actions

# Systems Theory: Core Concept

- Emergent properties . . .

  whole > than the sum of its parts

# Enhance Safety . . .

Strengthen Safety Traits!

*through knowledge + action*

# *'Safety Culture'* Emerges from Safety Traits

# Important System Needs

- Communication
- Integration (organizational)

# Allision of Staten Island Ferry *Andrew J. Barberi*
# St. George, Staten Island, New York
# October 15, 2003

**Marine Accident Report**
NTSB/MAR-05/01

PB2005-916401
Notation 7628A

National
Transportation
Safety Board
Washington, D.C.

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11 fatalities, 70 injured

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# Probable Cause

"…was the assistant captain's unexplained incapacitation and the failure of the New York City Department of Transportation to implement and oversee safe, effective operating procedures for its ferries."

# Safety Recommendations

- To the U.S. Coast Guard:

Seek legislative authority to require all U.S.-flag ferry operators to implement safety management systems, and once obtained, require all U.S.-flag ferry operators to do so. (M-05-06)

- To the States Operating Public Ferries:

Encourage your public ferry operators to voluntarily request application of the Federal requirements at 33 CFR 96 for implementing a safety management system.

- To the Passenger Vessel Association:

Encourage your member ferry operators to voluntarily request application of the Federal requirements at 33 CFR 96 for implementing a safety management system, if they have not already done so. (M-05-08)

# Implementation

- Organizational Restructuring

Increased staffing

New organizational model

Technical training

Operational review and procedures

Advanced technology

- Implementation of SMS

Gap analysis

Employee training

Employee committees

Compliance

- Maritime Industry Model

Custom SMS – broad-based buy-in

Document of Compliance issued by October 2005

Event Tracking System

Improvement across-the-board metrics

Allision of Passenger Ferry *Andrew J. Barberi*
With St. George Terminal
Staten Island, New York
May 8, 2010

**Marine Accident Report**

NTSB/MAR-12/01
PB2012-916401

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**Figure 6.** Video images of the impact.

50 injured, 3 serious

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# Safety issues identified in this accident include:

Operational safety provided by safety management systems.

After a 2003 accident involving the Andrew J. Barberi, the New York City Department of Transportation Ferry Division voluntarily implemented a safety management system and trained its personnel in its procedures. This effort was evident in the 2010 accident, in which the personnel carried out their designated emergency response procedures in a timely and effective manner.

# Motivation to Change: Accidents and Losses

- Accidents/losses often needed to push difficult changes
- Creating change requires an organizational leader, or leaders, with sufficient influence and authority
- Some questioned whether organizations would make changes without an accident/losses

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