



NTSB National Transportation Safety Board

Maritime Safety Improvement Challenges

Presentation to:

Transportation Research Board

Marine Board Fall Meeting

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Outline

- **Aviation Collaboration Success Story**
- **Maritime Industry Challenges**
 - **Regulatory Structure**
 - **Information from Front-Line Workers**



NTSB 101

- Independent federal agency, investigate transportation mishaps, all modes
- Determine probable cause(s) and make recommendations to prevent recurrences
- Primary product: Safety recommendations
 - Favorable response > 80%
- ***SINGLE FOCUS IS SAFETY***
- Independence
 - Political: Findings and recommendations based upon evidence rather than politics
 - Functional: No “dog in the fight”



The Context: Increasing Complexity

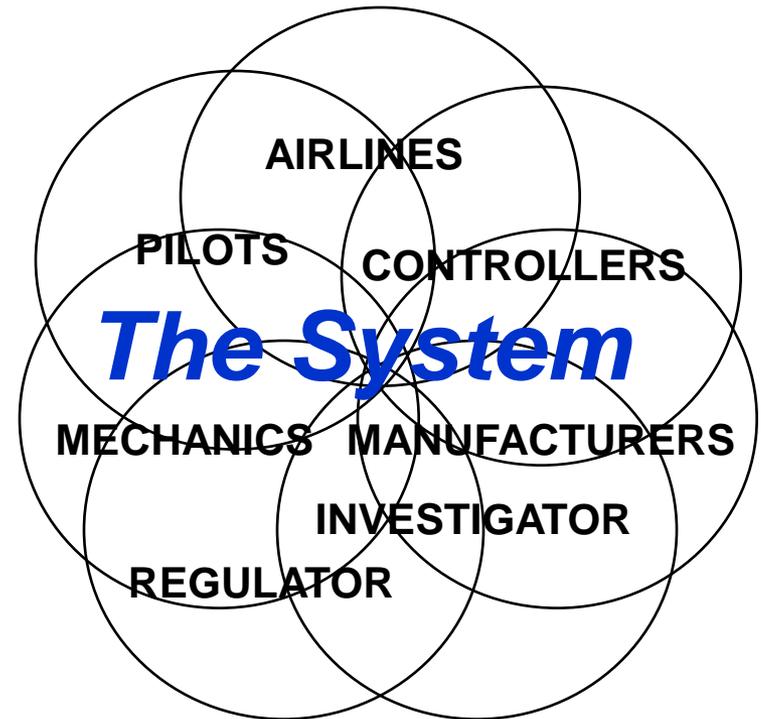
- **More System**

 - *Interdependencies*

 - Large, complex, interactive system
 - Often tightly coupled
 - Hi-tech components
 - Continuous innovation
 - Ongoing evolution

- **Safety Issues Are More Likely to Involve**

 - *Interactions Between Parts of the System*



The Result:

Front-Line Staff Who Are

- Highly Trained
- Competent
- Experienced,
- Trying to Do the Right Thing, and
- Proud of Doing It Well

... Yet They Still Commit

**Inadvertent
Human Errors**



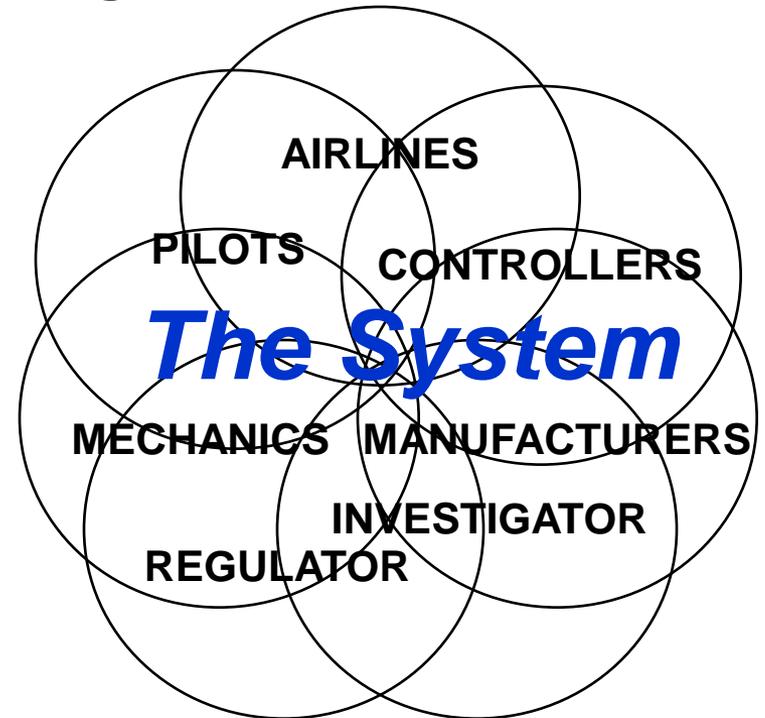
The Solution: System Think

Understanding how a change in one subsystem of a complex system may affect other subsystems within that system



Aviation “System Think” Process

- Engage All Participants In Identifying Problems and Developing and Evaluating Remedies
- Airlines
- Manufacturers
 - *With the systemwide effort*
 - *With their own end users*
- Air Traffic Organizations
- Labor
 - *Pilots*
 - *Mechanics*
 - *Air traffic controllers*
- Regulator(s) [Query: Investigator(s)?]



Aviation Success Story

83% Decrease in Fatal Accident Rate,
1998 - 2007

largely because of
System Think

fueled by
***Proactive Safety
Information Programs***

P.S. Aviation was already considered **VERY SAFE** in 1997!!



From Data to Information

Tools and processes to convert large quantities of data into useful information

Data Sources

Info from front line staff and other sources

DATA



Analysts

USEFUL

INFORMATION

Smart Decisions

- Identify issues
- **PRIORITIZE!!!**
- Develop solutions
- Evaluate interventions

Tools



Processes



Moral of the Story

Anyone who is
involved in the *problem*
should be
involved in the *solution*



Maritime Challenge #1: Regulatory Structure

- **Safety regulation by**
 - **Country (State) of licensure**
 - **State with geographic jurisdiction**

- **IMO sets standards, States may follow**
 - **Safety requirements vary from State to State**
 - **Licensure primarily revenue measure in some States**
 - **Safety regulation not necessarily comprehensive**



Maritime Challenge #2: Information From the Front Lines

- Reporting by front-line employees is the fuel for the “System Think” process

but . . .

- Maritime accidents frequently cause pollution
- Pollution statutes often criminal
- Punitive environment deters reporting by front-line employees



Thank You!!!



Questions?

