NTSB National Transportation Safety Board

Maritime Safety Improvement Challenges

Presentation to:

Transportation Research Board

Marine Board Fall Meeting

Name: Christopher A. Hart

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<u>Outline</u>

- **Aviation Collaboration Success Story**

- **Maritime Industry Challenges**
  - **Regulatory Structure**
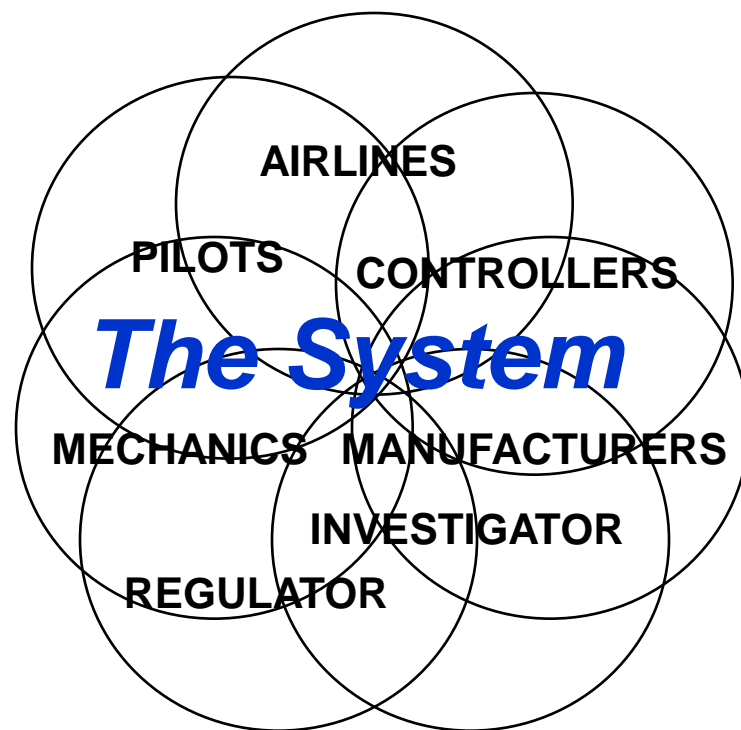 - **Information from Front-Line Workers**

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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 System

AIRLINES

PILOTS

CONTROLLERS

MECHANICS   MANUFACTURERS

INVESTIGATOR

REGULATOR

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The Result:

Front-Line Staff Who Are
- Highly Trained
- Competent
- Experienced,
- Trying to Do the Right Thing, and
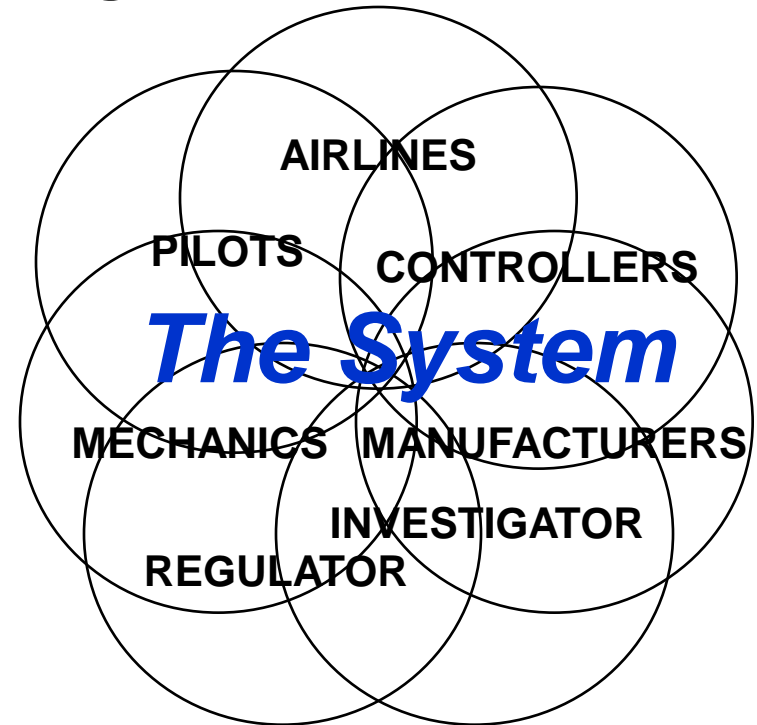**- Proud of Doing It Well**

. . . 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)?]**

AIRLINES

PILOTS   CONTROLLERS

The System

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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

Tools

Processes

Smart Decisions

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

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

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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**

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Thank You!!!

Questions?