



**NTSB** National Transportation Safety Board

# HRO Through Collaboration: An Aviation Industry Success Story

Presentation to:

Federal HRO Roundtable

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# The Contrast

## - Conventional Wisdom:

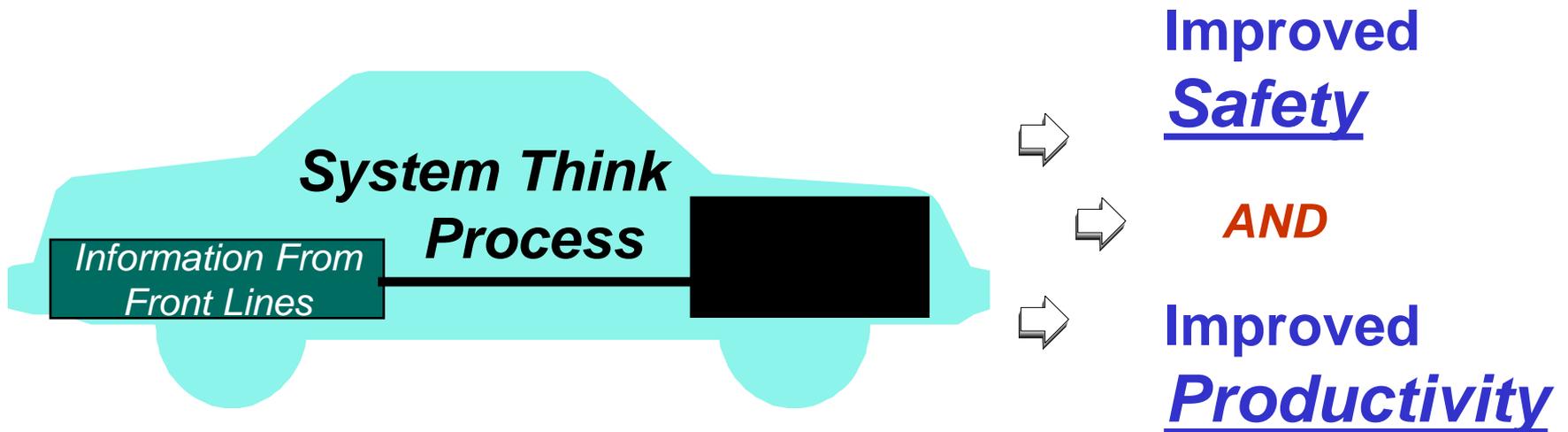
Improvements that reduce risk usually  
*also reduce productivity*

## - Lesson Learned from Proactive Aviation Safety Programs:

Risk can be reduced in a way that also results in  
*immediate productivity improvements*



# Process Plus Fuel Creates a Win-Win



# Outline

- **The Context**
- **Importance of “System Think”**
- **Importance of Better Information**
- **Safety Benefits**
- **Productivity Benefits**
- **Roles of Leadership and Regulator**



# 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

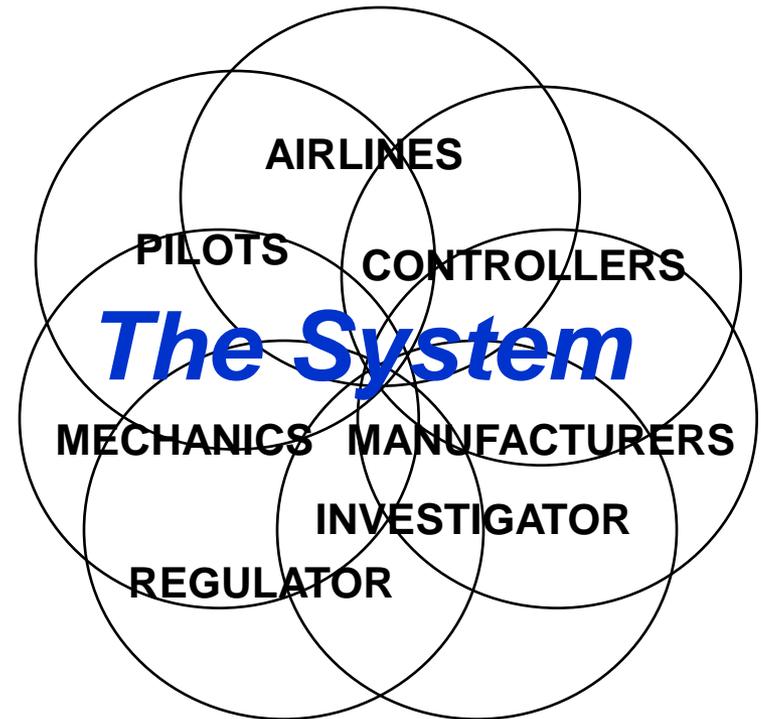
- **More System**

  - 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*



# Effects of Increasing Complexity:

**More** “Human Error” Because

- **System More Likely to be Error Prone**
- **Operators More Likely to Encounter Unanticipated Situations**
- **Operators More Likely to Encounter Situations in Which “By the Book” May Not Be Optimal (“workarounds”)**



# 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***



# “System Think” via Collaboration

**Bringing all parts of a complex system together to collaboratively**

- **Identify potential issues**
- ***PRIORITIZE* the issues**
- **Develop solutions for the prioritized issues**
- **Evaluate whether the solutions are**
  - **Accomplishing the desired result, and**
  - **Not creating unintended consequences**



# When Things Go Wrong

## How It Is Now . . .

You are highly trained

*and*

If you did as trained, you  
would not make mistakes

so

You weren't careful  
enough

so

You should be **PUNISHED!**

## How It Should Be . . .

You are human

*and*

Humans make mistakes

so

Let's *also* explore why the  
system allowed, or failed to  
accommodate, your mistake

*and*

Let's **IMPROVE THE SYSTEM!**



# Fix the Person or the System?

Is the **Person**  
*Clumsy?*

Or Is the  
Problem . . .

The *Step???*



# **Enhance Understanding of Person/System Interactions By:**

- Collecting,**
  - Analyzing, and**
  - Sharing**
- # **Information**



# Objectives:

**Make the System**

***(a) Less  
Error Prone***

**and**

***(b) More  
Error Tolerant***



# The Health Care Industry

## *To Err Is Human:*

### *Building a Safer Health System*

**“The focus must shift from blaming individuals for past errors to a focus on preventing future errors by designing safety into the system.”**

**Institute of Medicine, Committee on Quality of Health Care in America, 1999**



# **Major Source of Information: Hands-On “Front-Line” Employees**

**“We Knew About  
That Problem”**

***(and we knew it might hurt  
someone sooner or later)***



# Next Challenge



**Legal/Cultural Issues**

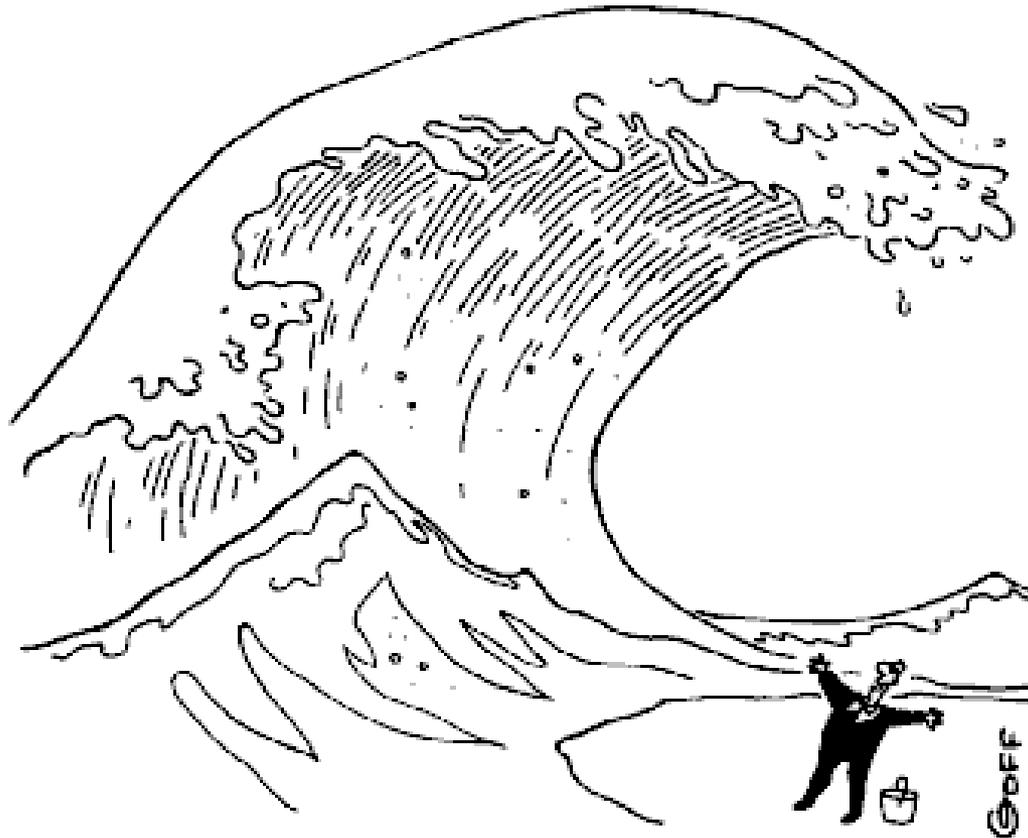
**Improved Analytical Tools**

*As we begin to get over the first hurdle, we must start working on the next one . . .*



# Information Overload

© 1996 Ted Goff



"EUREKA! MORE INFORMATION!"

# 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**



# Aviation Success Story

**83% Decrease** in Fatal Accident Rate,  
1997 - 2007

largely because of  
***System Think***

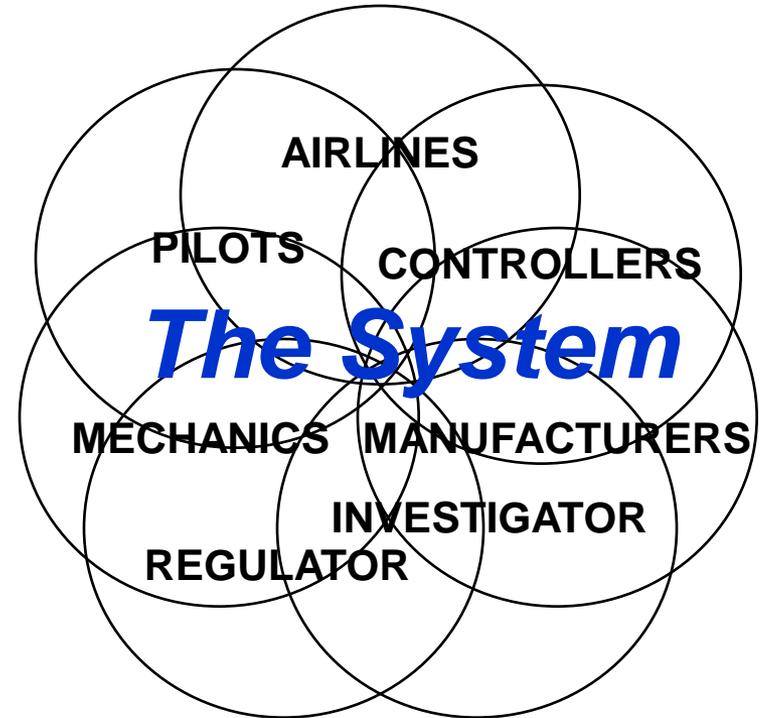
fueled by  
***Proactive Safety  
Information Programs***

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



# 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)?]



# Moral of the Story

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



# Collaboration: A Major Paradigm Shift

- **Old: Regulator identifies a problem and proposes solutions**
  - Industry skeptical of regulator’s understanding of the problem
  - Industry resists regulator’s solutions and/or implements them begrudgingly
  
- **New: Collaborative “System Think”**
  - Industry involved in identifying problem
  - Industry “buy-in” re interventions because everyone had input, everyone’s interests considered
  - Prompt and willing implementation
  - Interventions evaluated . . . *and tweaked as needed*
  - Solutions probably more effective and efficient
  - Unintended consequences much less likely



# Challenges of Collaboration

- Human nature: “I’m doing great . . . *the problem is everyone else*”
- Differing and sometimes competing interests
  - Labor-management issues
  - May be potential co-defendants
- Regulator probably not welcome
- Not a democracy
  - Regulator must regulate
- Requires all to be willing, in their *enlightened self-interest*, to leave their “comfort zone” and think of the System



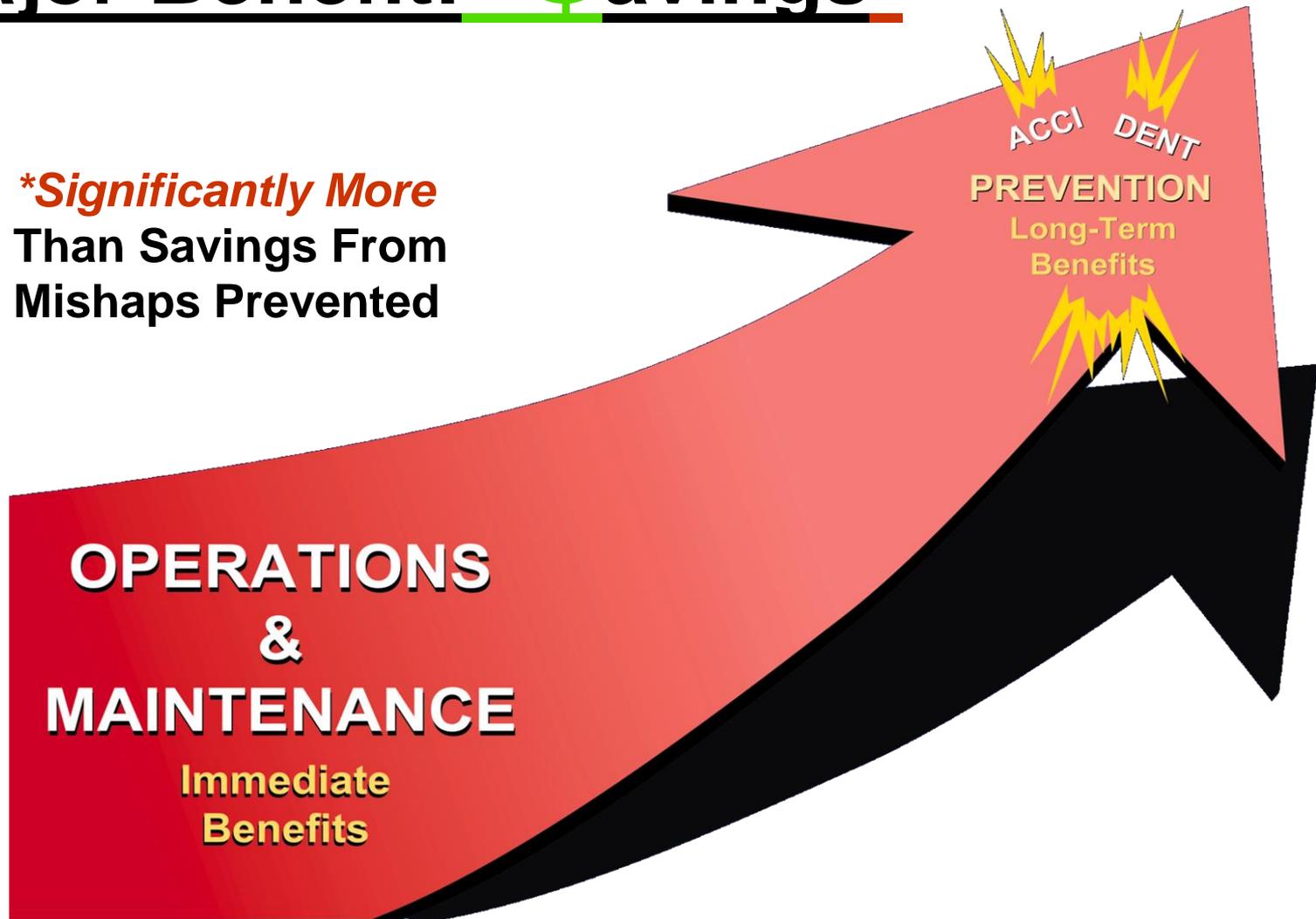
# System Think at Other Levels

- **“System Think” can be successful at any macro/micro level, including**
  - Entire industry
  - Company (some or all)
  - Type of activity
  - Facility
  - Team
- **“System Think” for a persistent workplace safety issue?**



# Major Benefit: Savings\*

*\*Significantly More*  
Than Savings From  
Mishaps Prevented



# The Role of Leadership

- Demonstrate Safety Commitment . . .

***But Acknowledge That Mistakes Will Happen***

- Include “Us” (e.g., System) Issues,  
Not Just “You” (e.g., Training) Issues

- **Make Safety a Middle Management Metric**

- Engage Labor Early

- Include the **System** --

**Manufacturers, Operators, Regulator(s), and Others**

- Encourage and Facilitate Reporting

- Provide **Feedback**

- Provide Adequate **Resources**

- **Follow Through** With Action



# How The Regulator Can Help

- Emphasize the importance of System issues *in addition to (not instead of)* worker issues
- Encourage and participate in industry-wide “System Think”
- Facilitate collection and analysis of information
  - Clarify and announce *policies for protecting information and those who provide it*
  - Encourage other industry participants to do the same
- Recognize that *compliance* is very important, but the *mission is reducing systemic risk*

Thank You!!!



*Questions?*

