



**NTSB** National Transportation Safety Board

**Collaboration:**

***Safety Culture***

***at the***

***Industry Level***

Presentation to:

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Management Conference

Name: Christopher A. Hart

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# Outline

- **Collaboration to Reduce Risk**
- **Improving Productivity, Too**
- **Role of**
  - **Leaders**
  - **Regulators**



# NTSB 101

- Independent federal agency, investigate transportation accidents, all modes
- Determine probable cause(s) and make recommendations to prevent recurrences
- Determine *cause*, not *liability or blame*
- ***SINGLE FOCUS IS SAFETY***
- Primary product: Safety recommendations
  - Acceptance rate > 80%



# The Context: Increasing Complexity

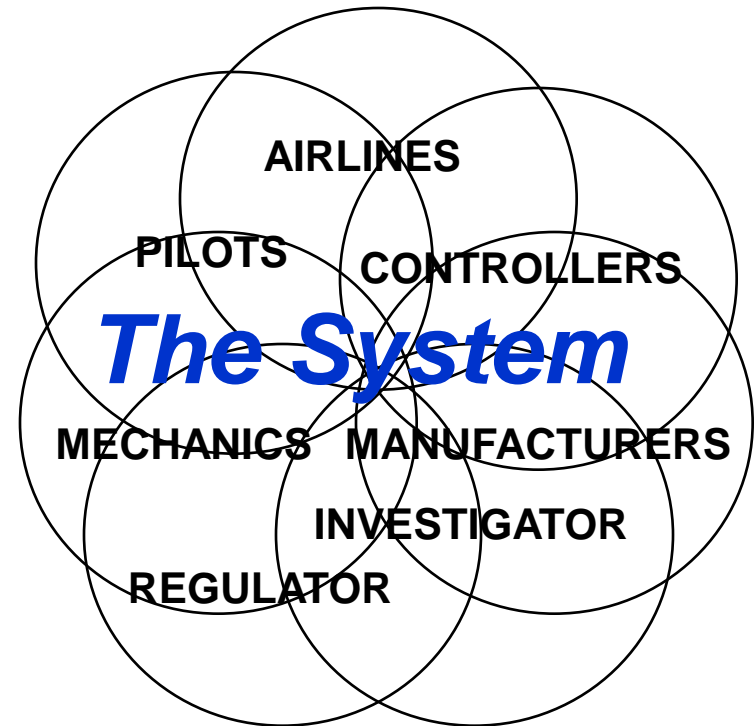
- **More System**

  - ***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 Solution – System Think**

***Awareness of 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**

- **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**



# Collaboration: A Major Paradigm Shift

- **Old: Regulator identifies a problem and proposes solutions**
  - Industry skeptical of leader’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 players have “ownership interest” re solution because everyone had input, everyone’s interests mutually considered
  - Prompt and willing implementation (and tweaking)
  - Solution 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 between participants
  - Participants are potential adversaries
- 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

TRUST



# Objectives:

**Make the System**

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

**and**

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



# Aviation Success Story

**65% 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!!

## Footnote

**This collaborative process was  
successful**

***without generating***

***any new regulations!!***



# Manufacturer “System Think” Success

Aircraft manufacturers are increasingly seeking input, throughout the design process, from

- *Pilots* (User Friendly)
- *Mechanics* (Maintenance Friendly)
- *Air Traffic Services* (System Friendly)

# Not Only Improved Safety, But Improved Productivity, Too

- **Ground Proximity Warning System**
  - **S:** *Reduced warning system complacency*
  - **P:** *Reduced unnecessary missed approaches, saved workload, time, and fuel*
- **Flap Overspeed**
  - **S:** *No more potentially compromised airplanes*
  - **P:** *Significantly reduced need to take airplanes off line for **VERY EXPENSIVE (!!) disassembly, inspection, repair, and reassembly***



**But Then . . .**

**Why Are We**

**So Jaded in The Belief That**

***Improving Safety***

***Will Probably***

***Hurt The Bottom Line??***

# Costly Result\$ Of Safety Improvements Poorly Done

## Safety *Poorly* Done

1. Punish/re-train operator
  - *Poor workforce morale*
  - *Poor labor-management relations*
  - *Labor reluctant to tell management what's wrong*
  - *Retraining/learning curve of new employee if "perpetrator" moved/fired*
  - *Adverse impacts of equipment design ignored, problem may recur because manufacturers are not involved in improvement process*
  - *Adverse impacts of procedures ignored, problem may recur because procedure originators (management and/or regulator) are not involved in improvement process*

## Safety *Well* Done

**Look beyond operator,  
also consider system  
issues**

# Costly Result\$ Of Safety Poorly Done (con't)

## Safety *Poorly* Done

### 2. Management decides remedies unilaterally

- *Problem may not be fixed*
- *Remedy may not be most effective, may generate other problems*
- *Remedy may not be most cost effective, may reduce productivity*
- *Reluctance to develop/implement remedies due to past remedy failures*
- *Remedies less likely to address multiple problems*

### 3. Remedies based upon instinct, gut feeling

- *Same costly results as No. 2, above*

## Safety *Well* Done

### Apply “System Think,” *with workers*, to identify and solve problems

### Remedies based upon evidence (including info from front-line workers)

# Costly Result\$ Of Safety Poorly Done (con't)

## Safety *Poorly* Done

4. Implementation is last step

- *No measure of how well remedy worked (until next mishap)*
- *No measure of unintended consequences (until something else goes wrong)*

## Safety *Well* Done

Evaluation after implementation

### So . . . Is Safety Good Business?

- *Safety implemented poorly can be **very costly (and ineffective)***
- *Safety implemented well, in addition to improving safety more effectively, can also **create benefits greater than the costs***

# The Role of Leadership

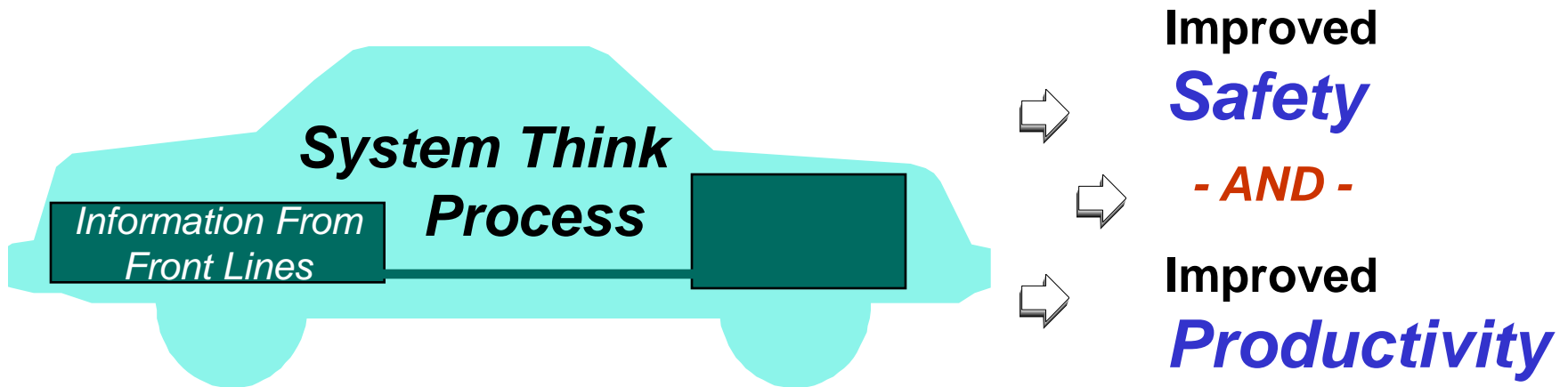
- Demonstrate Safety Commitment . . .
  - But Acknowledge That Mistakes Will Happen*
- Include “Us” (e.g., System) Issues,  
Not Just “You” (e.g., Training) Issues
- **Make Safety a Middle Management Metric**
  - Engage Labor Early
  - Include the *System* --  
Manufacturers, Operators, Regulator(s), and Others
- Encourage and Facilitate Reporting
  - Provide *Feedback*
  - Provide Adequate *Resources*
  - *Follow Through* With Action

# How The Regulator Can Help

- Emphasize 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*



# Conclusion: Process Plus Fuel Enables A Win-Win



Thank You!!!



*Questions?*

