NTSB National Transportation Safety Board

Collaboration

to

Reduce Risk

and

Improve Productivity

Presentation to: Wells Fargo

Leadership Meeting

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Outline

- **Collaboration to Reduce Risk**

- **Improving Productivity**
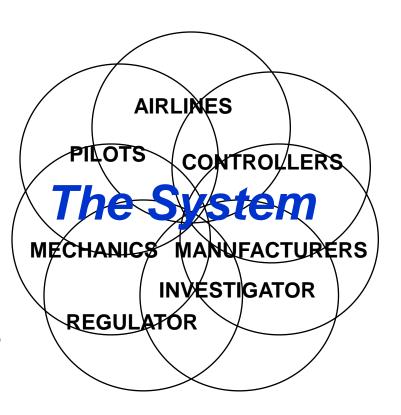
- **Role of**
  - **Leaders**
  - **Regulators**

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*

AIRLINES

PILOTS **CONTROLLERS**

The System

MECHANICS **MANUFACTURERS**

INVESTIGATOR

REGULATOR

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

When Something Goes 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!

Another 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

"System Think" via Collaboration

Bringing representatives from all parts of a complex system together to

- **Identify potential issues**

- ***PRIORITIZE*** **the issues (most difficult step, never perfect)**

- **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: "Leader" identifies a problem and proposes solutions
    - Prospective implementers are skeptical of leader's understanding of the problem
    - Prospective implementers resist leader's solutions and/or implement them begrudgingly

- New: Collaborative "System Think"
    - Implementers involved in identifying problem
    - Implementers have "ownership interest" re solution because everyone had input, everyone's interests considered and better understood by all
    - 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**

- **"Leader" (regulator?) probably not welcome**

- **Not a democracy**
  - **Leader must lead (regulator must regulate)**

- **Requires all to be willing, in their enlightened self-interest, to leave their "comfort zone" and think of the System**

Collaboration to Reduce Risk

Is the **Person** *Clumsy?*

Or Is the Problem . . .

The ***Step???***

Enhance Understanding of Person/System Interactions By:

- Collecting,

- Analyzing, and

- Sharing

Information

Major Source of Information: Hands-On "Front-Line" Employees

"We Knew About That Problem"

(and we knew it might hurt

someone sooner or later)

Objectives:

(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!!

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)

Moral of the Story

- **"System Think" can be successful at any macro/micro level, including**
  - **Entire industry**
  - **Company (some or all)**
  - **Type of activity**
  - **Facility**
  - **Team**

Icing on the Cake –
Not Just Safety, But 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 out of service for VERY EXPENSIVE (!!) disassembly, inspection, repair, 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   **Safety _Well_ Done**

1. **Punish/re-train operator**   **Look beyond operator,
                                       also consider system issues**

- 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_

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

Safety *Poorly* Done

2. Management decides remedies unilaterally

- Problem may not be fixed
- Remedies may not be most effective, may generate other problems
- Remedies may not be most cost effective, may reduce productivity
- Workers reluctant to develop/implement remedies due to failures of previous remedies
- 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	**Safety _Well_ Done**
4. Implementation is last step	**Evaluation after implementation**

- No measure of how well remedy worked (until next mishap)

- No measure of unintended consequences (until something else goes wrong)

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*
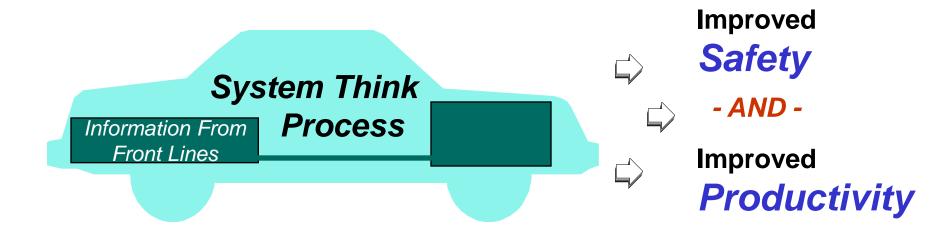
The Role of Leadership

- 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

System Think Process

Information From Front Lines

Improved **Safety**

- AND -

Improved **Productivity**

Thank You!!!

Questions?