

Improving Safety While Improving Productivity: A Suggestion



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Question

Do you have any workplace mishaps that

- Are occurring *much too often*,
- Have been *troublesome for a long time*,
and
- Have had several remedies applied, but
none have fixed the problem?



Outline

- The “System Think” Concept
- Aviation System Think Success
 - Industry Level
 - Manufacturer Level
- Suggestion for Recurring Problems
- Improving Productivity



But First . . . NTSB 101

- Independent federal agency, investigate transportation mishaps, all modes
- Findings, recommendations based upon evidence rather than politics
- Determine probable cause(s) and make recommendations to prevent recurrences
- ***SINGLE FOCUS IS SAFETY***
- Primary product: Safety recommendations
 - Favorable response > 80%



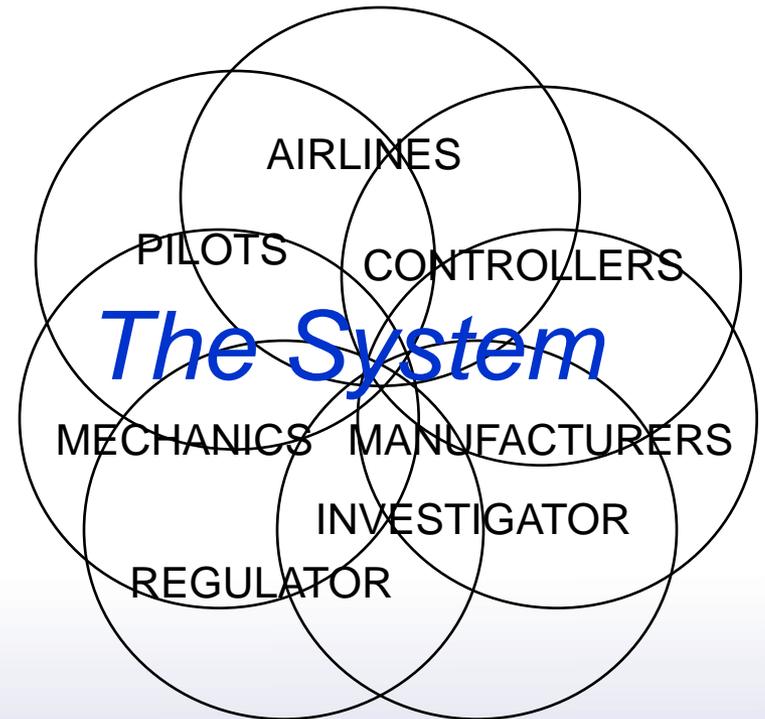
Troubling, Too-Frequent Mishaps

- Suggest a voluntary collaborative effort
- Suggest focusing on trends, rather than individual events
 - If trend is longstanding, problem is probably systems and processes rather than people
 - Thus, punishment of individuals will probably not solve the problem (and may make it worse)
 - Employees are more willing to participate in the investigation because it is focused on improvement rather than punishment



The Challenge: 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*



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!**



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



“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



Objectives:

Make the System

*(a) Less
Error Prone*

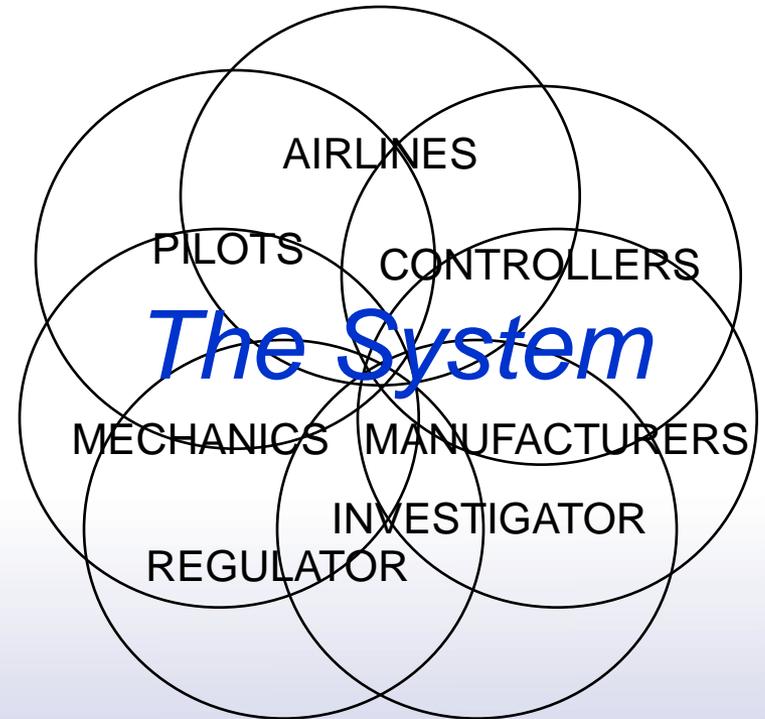
and

*(b) More
Error Tolerant*



Aviation Industry Collaboration

- 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)



Success Story

83% Decrease in Fatal Accident Rate,
1997 - 2007

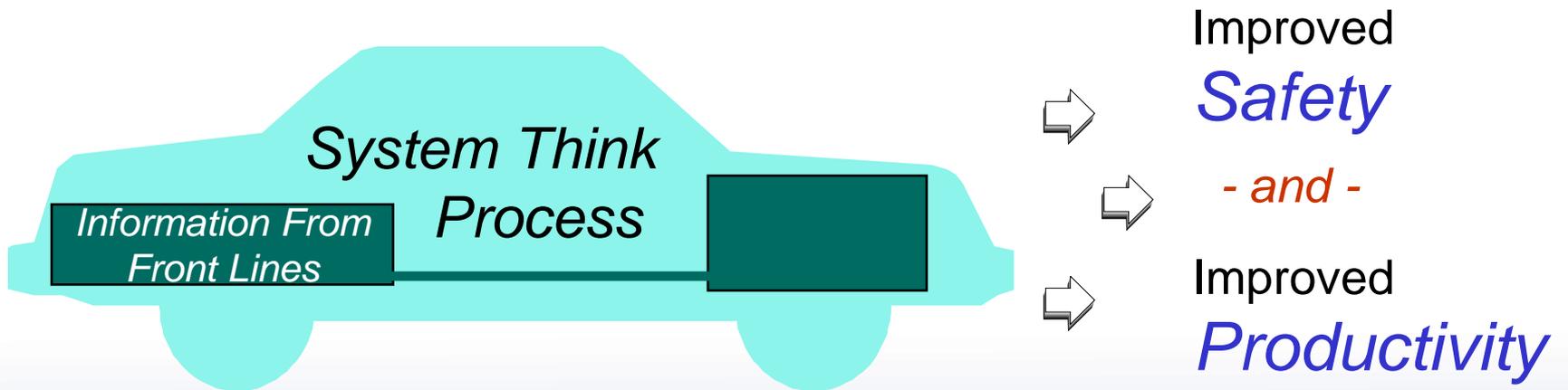
largely because of
System Think

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

P.S. Contrary to conventional wisdom, ***productivity also increased!***



Process Plus Fuel Creates A Win-Win



Major Paradigm Shift

- Old: The regulator identifies a problem, proposes solutions
 - Industry skeptical of regulator’s understanding of the problem
 - Industry fights regulator’s solutions and/or implements them begrudgingly
- New: Collaborative “System Think”
 - Industry is involved in identifying the problem
 - Industry “buy-in” re solutions because everyone had input, everyone’s interests considered
 - Process is *completely voluntary*
 - Prompt and willing implementation . . . *and tweaking*
 - 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*”
- Participants may have competing interests, e.g.,
 - Labor/management issues
 - May be potential co-defendants
- Regulator probably not welcome
- Not a democracy
 - Regulator must regulate
- Process is voluntary, but all must be willing, *in their enlightened self-interest*, to leave their “comfort zone” and think of the System



Success at Another Level

Aircraft manufacturers are increasingly seeking input, from the earliest phases of the design process, from

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



Collaboration at Other Levels?

- Entire Industry
- Company (Some or All)
- Type of Activity
- Facility
- Team



Moral of the Story

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



Collaboration Suggestion

- Select a longstanding troublesome process that has resulted in mishaps too often
- Identify everyone who has a “dog in the fight” – *both within and outside of the organization*
- Create an “Improvement Team” that includes all of the above
- Task the Improvement Team with identifying the problem(s) and developing process improvements
- Evaluate whether the improvements
 - Are producing the desired result
 - Have no unintended consequences



How Can This Improve Productivity?

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



Improving Productivity (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)



Improving Productivity (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***



Thank You!!!



Questions?



National Transportation Safety Board