National Transportation Safety Board

Collaboration: Improving Safety *and* Productivity

Presentation to
ASSE Safety 2015 Professional Development
Conference and Exposition

NTSB Chairman Christopher A. Hart
June 8, 2015

Before We Begin . . . Thank You!

Dear Acting Chairman Hart:

On behalf of our more th ber safety ession the rican So of Safety Engineers (ASSE) offers its support for th nal Tr rtation S Board's (NTSB) to ac measu that can encourage states to reduce the legal stand driver i ment d nsumpti s r ured lood-alcohol content (BAC), from 0.08% to 0.05%.

ASSE's interest in see t the le andard f driver im nt is lowered ar from nem interest in doing whatever is onably p e driving year more work die on c ation ghways than any other kind of workplace, as the NTSB fully understands. On the release of NTSB's 2 Safety Report, *Reaching Zero: Actions to Eliminate Alcohol-Impaired Driving (http://www.ntsb.gov/doclib/reports/2013/SR1301.pdf)*, the members of our Transportation Practice Specialty took it upon themselves to develop the attached position statement supporting NTSB's call.

.05%

And More Thanks!

2011 Position: Ban on PEDs While Driving

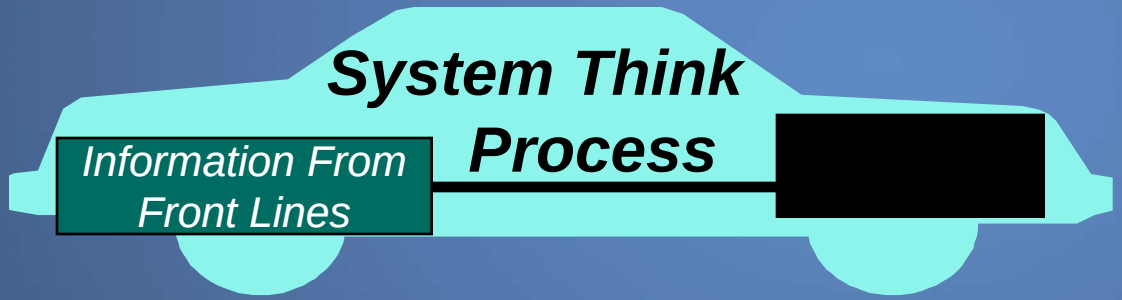
The following pres[illegible]as [illegible]ried [illegible]SE's [illegible]essage [illegible]ing the National Transportation Safety Board's (NTSB) call for a nationwide ban on d[illegible]er [illegible]e o[illegible]portable elec[illegible]onic dev[illegible]es [illegible]ile oper[illegible]in a moto[illegible]ve cle[illegible]. NTSB's [illegible] release can be found at http://www.ntsb.g[illegible]/news/2[illegible]. html. **AMERICAN SOCIETY OF SAFETY ENGINEERS SUPPORT NTSB's CALL FOR BAN ON USE OF PORTABLE ELECTRONIC DEVICES WHILE DRIVING DES PLAINES, IL** (December 16, 2011) – The American Society of Safety Engineers (ASSE) supports the National Transportation Safety Board's (NTSB) call for a nationwide ban on driver use of pers[illegible]al e[illegible]tronic devices (PEDs) while operating a motor [illegible]hic[illegible]. "[illegible]o often [illegible]che[illegible]ked is the fact that that the number one cause o[illegible] [illegible]job de[illegible]s [illegible]U. worke[illegible]s are [illegible]n[illegible]en[illegible] on our [illegible]ad[illegible]ays. [illegible]SB's call f[illegible]a ban can help achieve significant reductions [illegible]di[illegible]act[illegible]in through red[illegible]s in [illegible]e use of ce[illegible] phones [illegible]d other [illegible]lectronic [illegible]om[illegible]unication devices on our roadways, then more American workers will be able to return home safely to their families each day," ASSE President Terrie S. Norris, CSP, ARM, CPSI, said today. "Consistent with ASSE's policy on electronic devices in motor vehicles and safe driving practices ASSE and its 30,000 [illegible]cupational safety, health, and e[illegible]vironmental professionals look forward to doing all that we can to help make sure a na[illegible]wide ban b[illegible]comes [illegible]reality. The ban is just one of [illegible]e tools in the cam[illegible]paign to [illegible]educe [illegible]stracted driving." Founded in 1911, the [illegible]0-y[illegible]-old Des [illegible]laines[illegible]L-b[illegible]ASSE [illegible]olde[illegible] safety so[illegible]y. P[illegible]ease go to http://www.asse.org/professionalaffairs_new/positions/ddmv.php for ASSE's policy on safe driving practices.

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



Improved ***Safety***

AND

Improved ***Productivity***

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
- Do not determine blame or liability
- 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.”

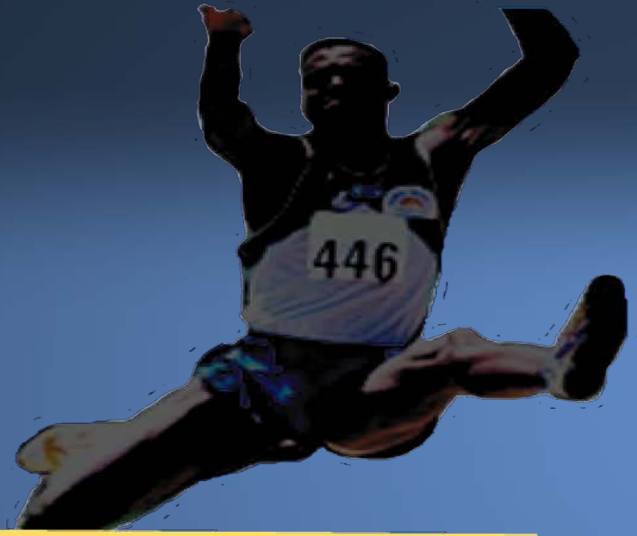
Institute of Medicine,
Committee on Quality of Health Care in America, 1999

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

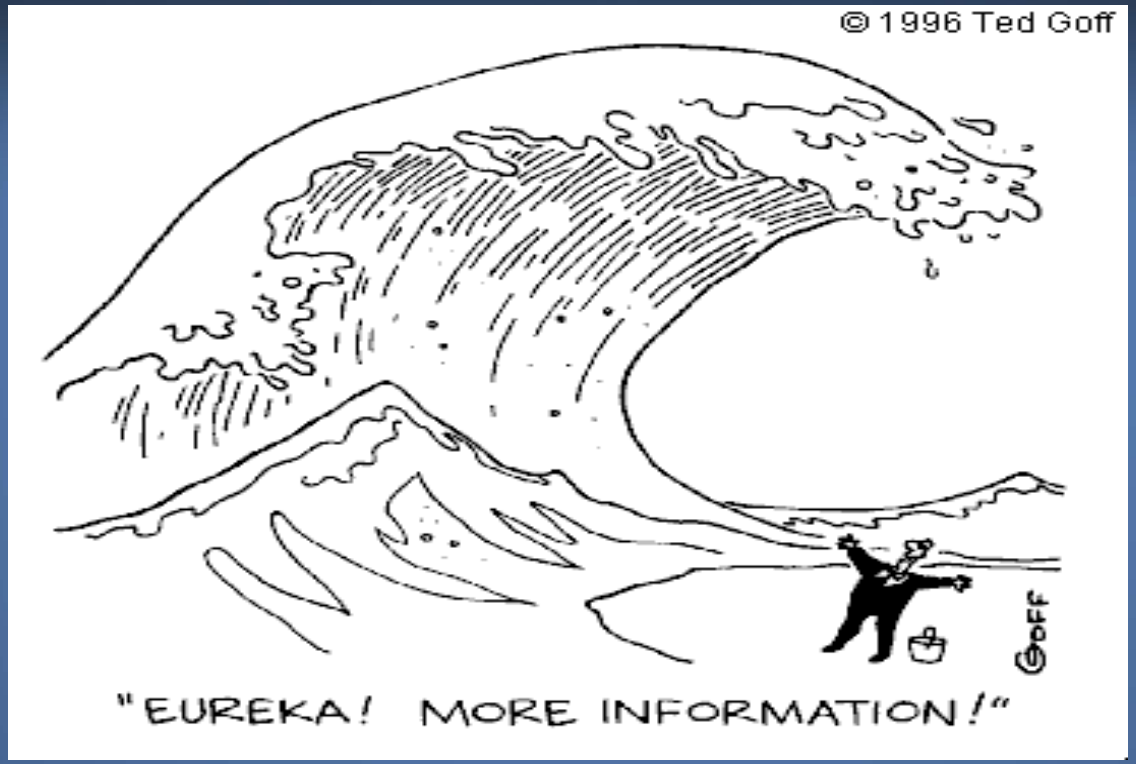


Legal/Cultural Issues

Improved Analytical Tools

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

Information Overload



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

Tools

Processes

USEFUL

INFORMATION

Smart Decisions

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

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!!

Aviation "System Think" Success

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

Major Paradigm Shift

- Old: The regulator identifies a problem, develops solutions
  - Industry skeptical of regulator's understanding of the problem
  - Industry fights regulator's solution and/or implements it 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"*
- 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
- Requires all to be willing, *in their enlightened self-interest,* to leave their "comfort zone" and think of the System

Applicability of Collaborative Approach:

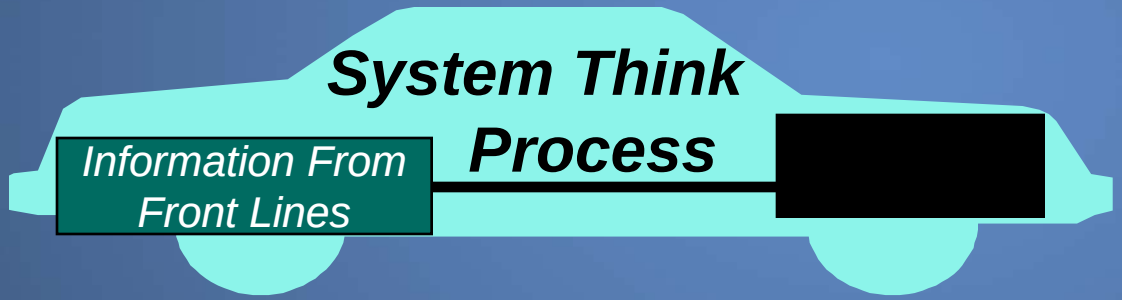
- Entire Industry
- Company (Some or All)
- Type of Activity
- Facility
- Team
- Workplace Safety?

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)**

Process Plus Fuel Can Produce An Amazing Win-Win



Improved
Safety

AND

Improved
Productivity

P.S. Collaboration also significantly reduces the likelihood of unintended consequences!

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	Safety *Well* Done
2. Management decides remedies unilaterally	Apply "System Think," ***with workers***, to identify and solve problems
3. Remedies based upon instinct, gut feeling	Remedies based upon evidence (including info from front-line workers)

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

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)*

Conclusion: 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 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 *agency's mission is reducing systemic risk*

Suggested Beta Test

- Select troublesome area
  - Nagging problem for many years
  - Many interventions have been tried, not successful
  - Likelihood that problems are systemic, not just people
  - Collaboration as effort to address the system problems
  - Less defensiveness because not focused on single event
- Select collaborative corrective action group
  - All who have a hand in the process
  - Manufacturers?
  - Operators?
  - Regulators?
  - Others?

Conclusions

- *Safety programs that improve the bottom line are more likely to be sustainable*
- *Collaboration can help generate safety programs that also improve productivity while improving safety*

Thank You!!!

Questions?