NTSB National Transportation Safety Board

Using Collaboration to Reduce Risk While Improving Productivity

Presentation to:

Pipeline Safety Trust

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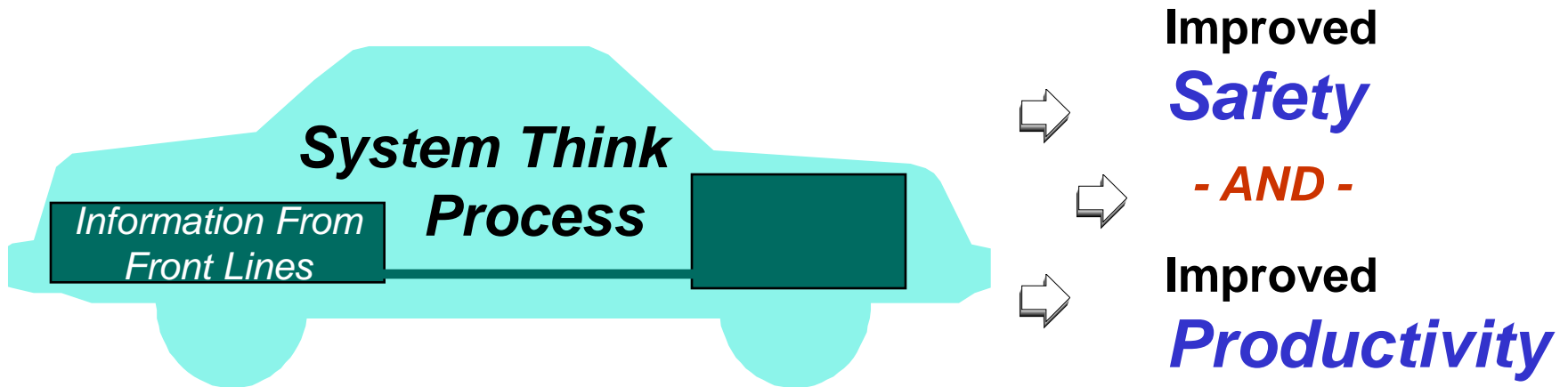
Date: November 17, 2011

The Contrast

- Conventional Wisdom:

Improvements that reduce risk usually *also reduce productivity*

- Lesson Learned from Proactive Aviation Safety Information Programs:

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

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Process Plus Fuel Creates A Win-Win

System Think Process

Information From Front Lines

Improved *Safety*

- AND -

Improved *Productivity*
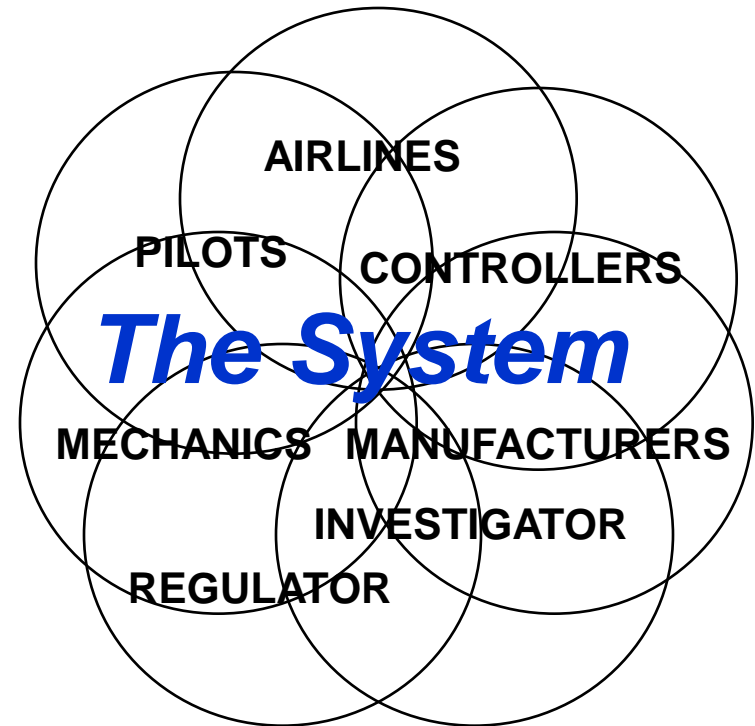
The Context: Increasing Complexity

- **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 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

Fix the Person or the System?

Is the Person Clumsy?

Or Is the Problem . . .

The Step???

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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

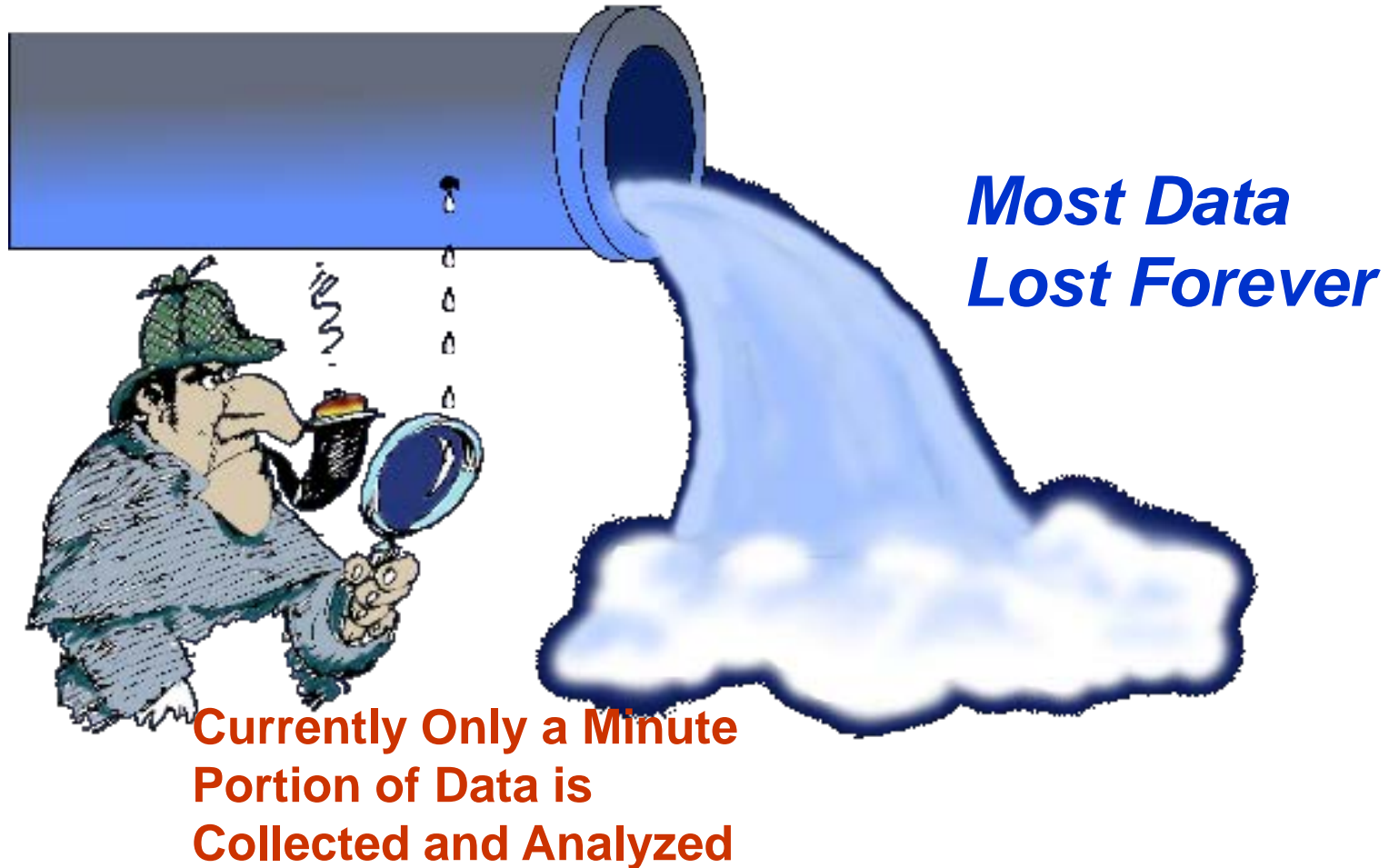# The Health Care Industry

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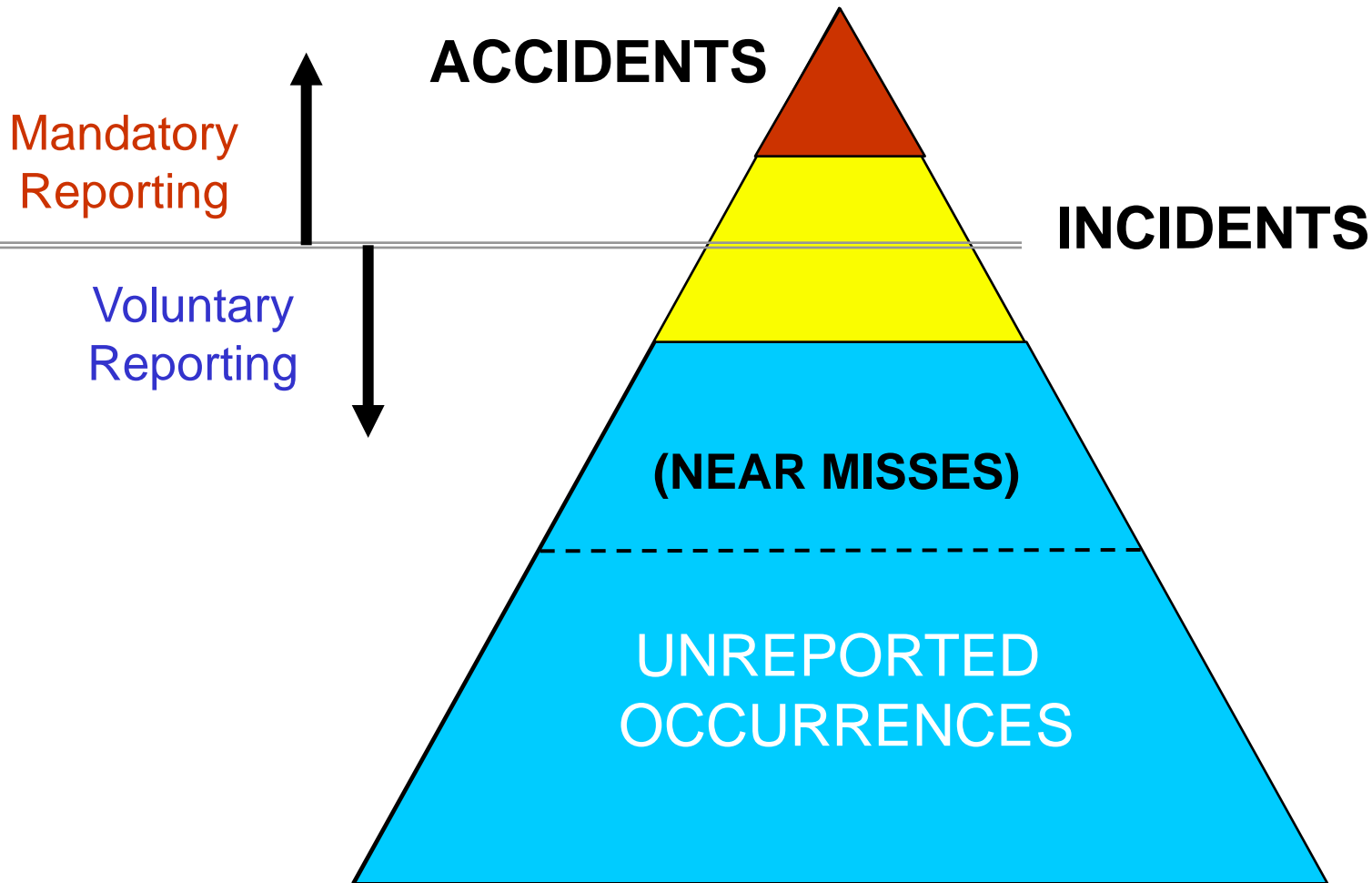
Institute of Medicine, Committee on Quality of Health Care in America, 1999

Current System Data Flow

Most Data Lost Forever

Currently Only a Minute Portion of Data is Collected and Analyzed

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Heinrich Pyramid

ACCIDENTS

Mandatory
Reporting

INCIDENTS

Voluntary
Reporting

(NEAR MISSES)

UNREPORTED
OCCURRENCES

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

"We Knew About That Problem"

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

Legal Concerns That Discourage Collection, Analysis, and Sharing

- **Public Disclosure**

- **Job Sanctions and/or Enforcement**

- **Criminal Sanctions**

- **Civil Litigation**
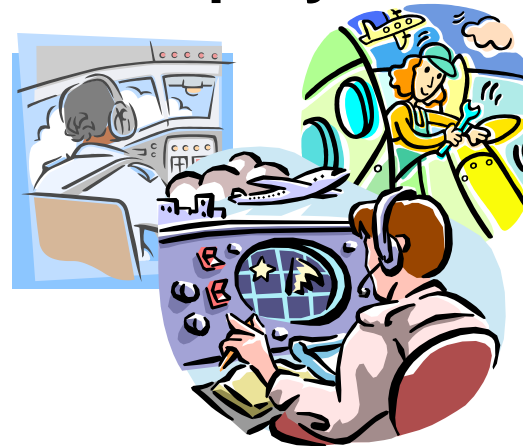
Typical "Cultural" Barrier

CEO

"Safety First"

Middle Management

"Production First"

Front-Line Employees

"Please the Boss First..."

THEN Consider Safety?

Next Challenge

Improved Analytical Tools

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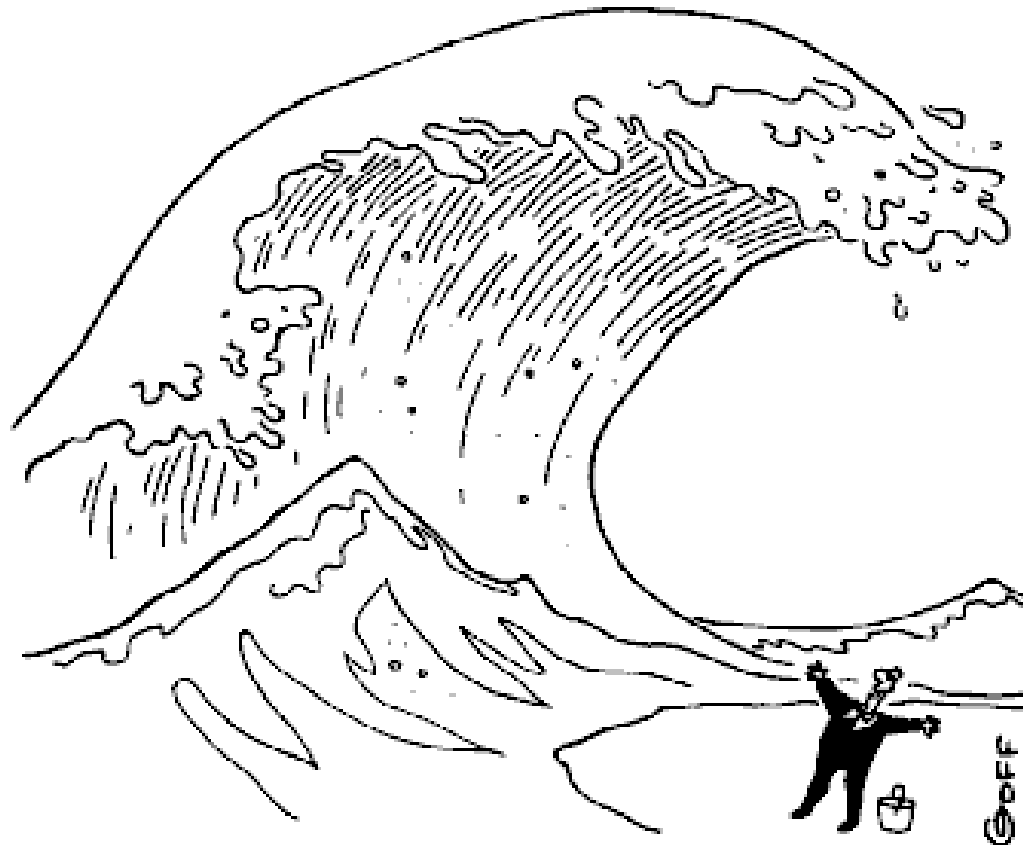
As we begin to get over the first hurdle, we must start working on the next one . . .

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
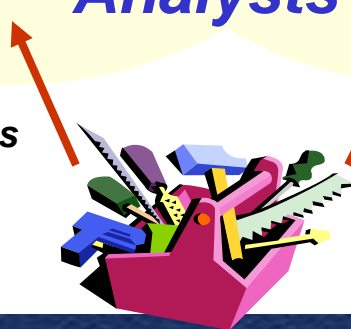
Info from front line staff and other sources

DATA

Analysts

USEFUL

INFORMATION

Smart Decisions

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

Tools

Processes

Aviation Success Story

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!!

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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)?]**

AIRLINES

PILOTS   CONTROLLERS

The System

MECHANICS   MANUFACTURERS

INVESTIGATOR
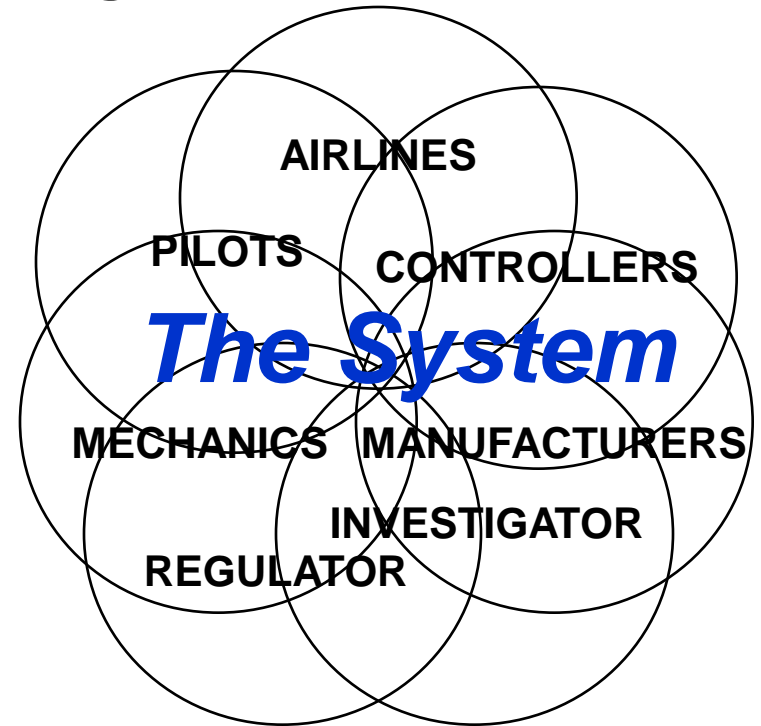
REGULATOR

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 indentifying problem
  - Industry "buy-in" re solution because everyone had input, everyone's interests considered
  - Prompt and willing implementation
  - Solution probably more effective and efficient
  - Unintended consequences much less likely

Challenges of Collaboration

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

– **Not a democracy**
  - **Regulator must regulate**

– **Regulator probably not welcome**

– **Labor/Management issues between some participants**

– **Participants are potential co-defendants**

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*

Thank You!!!

Questions?