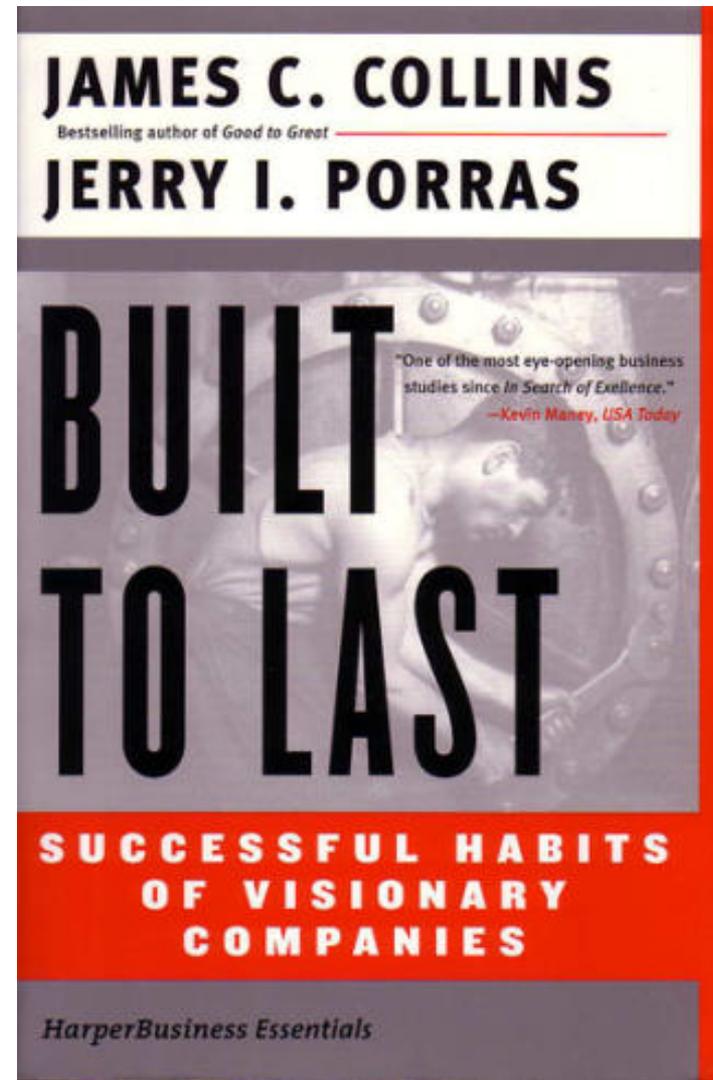
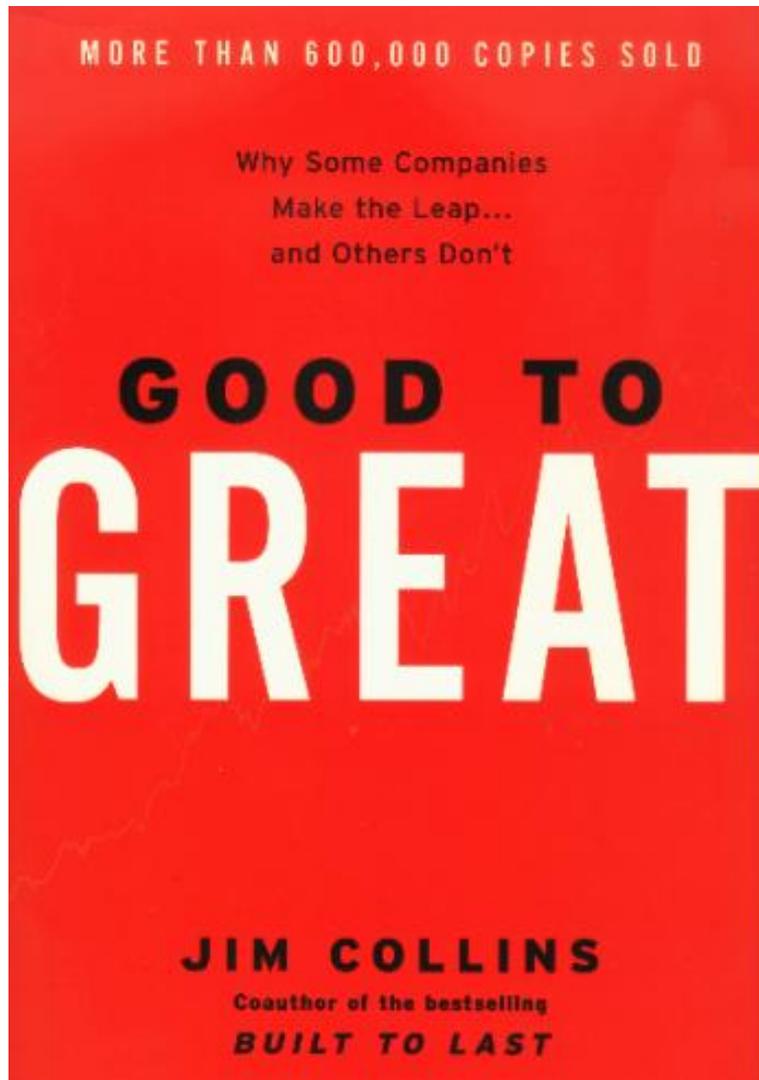


# Pathways to New Missions

Peter S. Winokur, Ph.D.  
ISM Champions Workshop  
September 16, 2010

*Thanks to Doug Minnema,  
Neysa Slater-Chandler, and Jim Liverman*

# New Missions

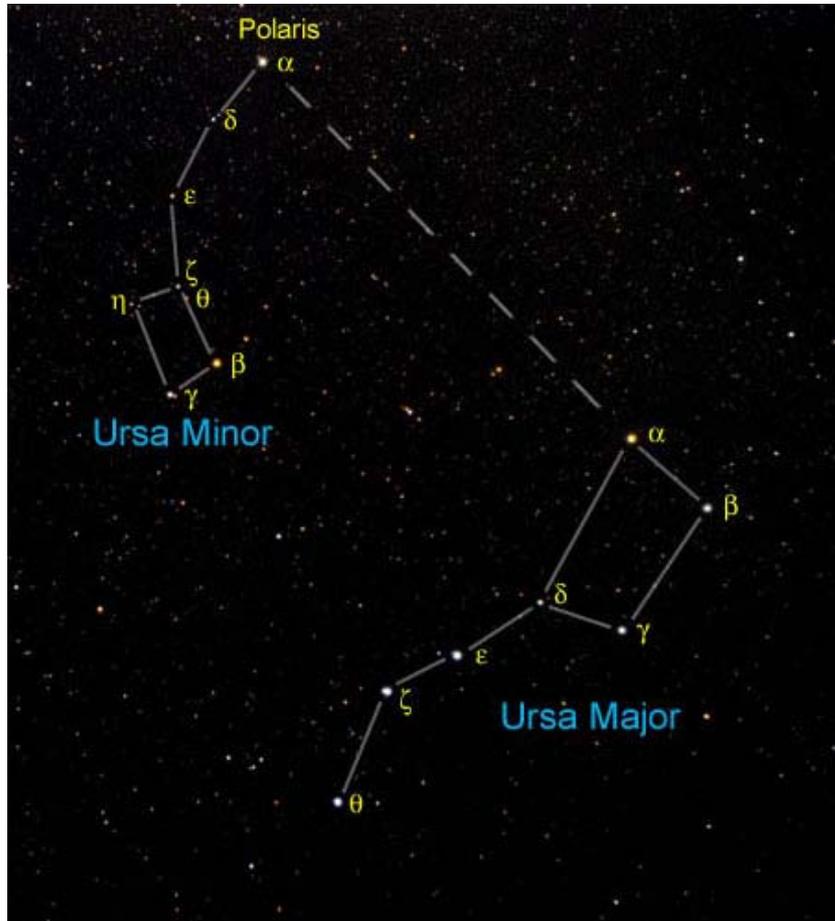


# Pop Quiz: How did they do this?

---



# Answer

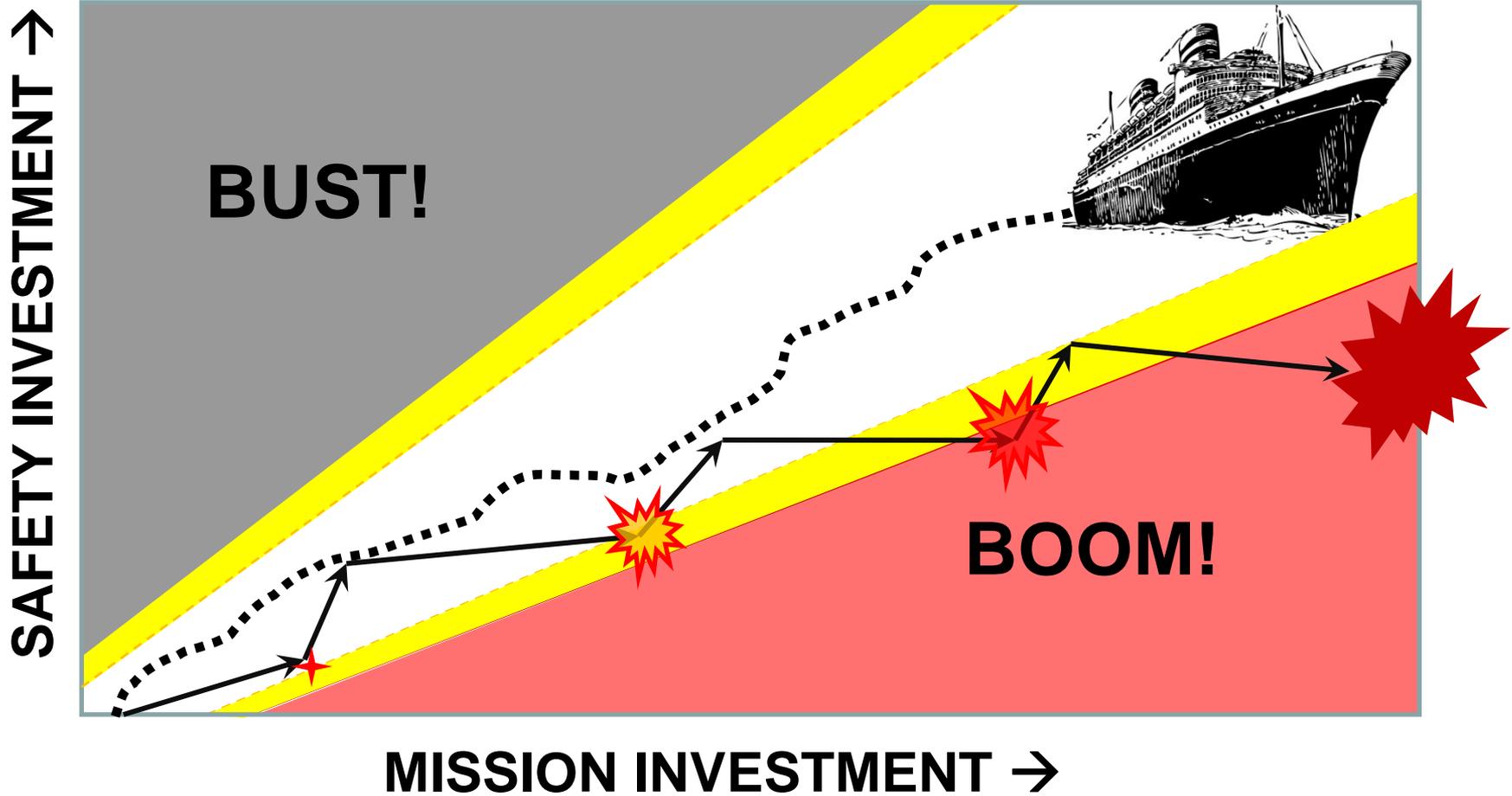


# Remember!



There is no GPS that will lead you safely into the unknown future. You must decide your own destination and use navigational aids for ensuring the safety of each step along the way.

# Maintain a Balanced Course



A modified "Reason Model" -- from Reason, 1997 and Starbuck, 1988.

# Navigational Aids



- **Integrated Safety Management**
- Leadership and Culture
- Metrics and Leading Indicators
- Awareness, Assurance, Oversight
- Regulatory Enforcement
- Safety in Design
- Nuclear Safety R&D
- Directives and Standards



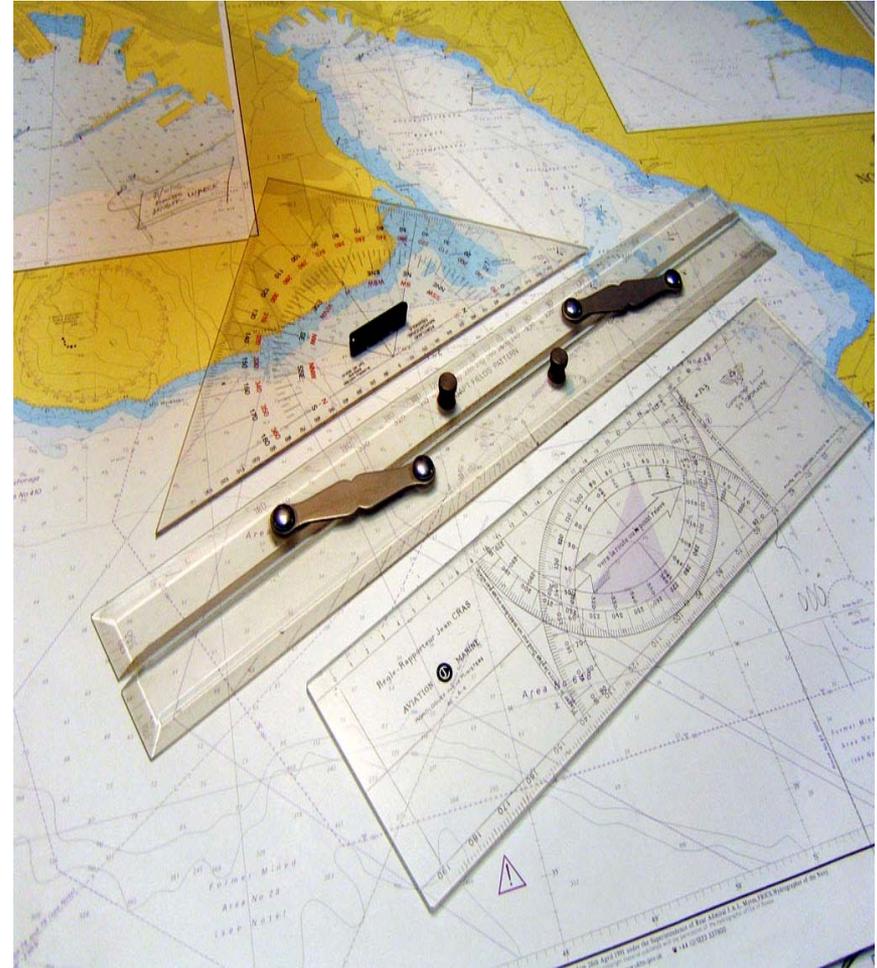
# Integrated Safety Management



Once you have a new mission, ISM helps by

- Evaluating potential hazards of each step to be taken
- Identifying controls to reduce or eliminate those hazards
- Helping you learn from the last step before taking the next step

**Charting a safe course  
is not enough –  
You must follow it!**



# Leadership and Culture



- Safety is a team effort
- Building a great team takes a great leader

**Are we building the leaders of tomorrow? Do we know how?**



# Leadership and Culture

---

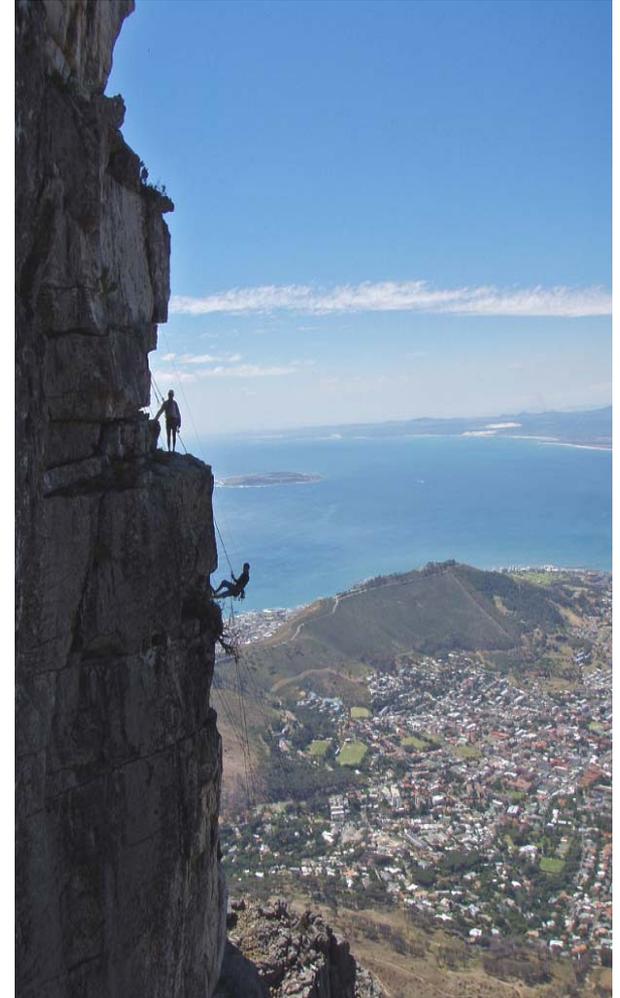


## **Leadership is not a “crash course”**

- Leadership development programs
- Hiring & promoting practices based on safety ethics as well as work ethics
- Succession planning
- Properly aligned rewards programs

## **Culture needs active management**

- Managers need to lead by example
- Employees need to be actively engaged
- *Organizational changes need evaluation for cultural and safety implications*
- Technical competence must persist
- To manage culture, we need metrics



# Metrics and Leading Indicators



- Metrics are a vital part of managing any effort
- For safety, managing by lagging metrics alone is risky and ineffective
- Leading indicators are metrics that tell us what may come to pass
- But there is no ideal leading indicator, so do not wait for one before starting
- Leading indicators only mature with use

**The value of any metric, leading or lagging, is determined by the quality of the decisions it facilitates**

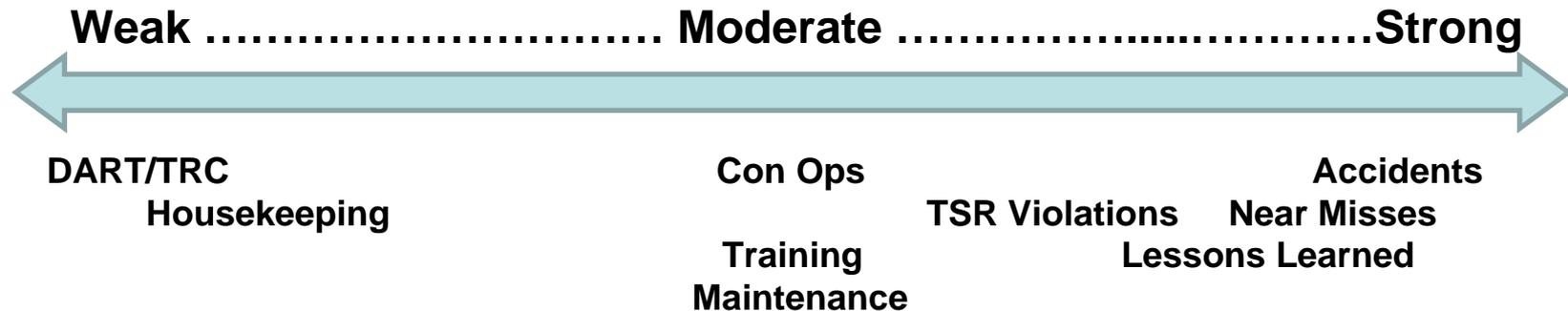


# Leading Indicators

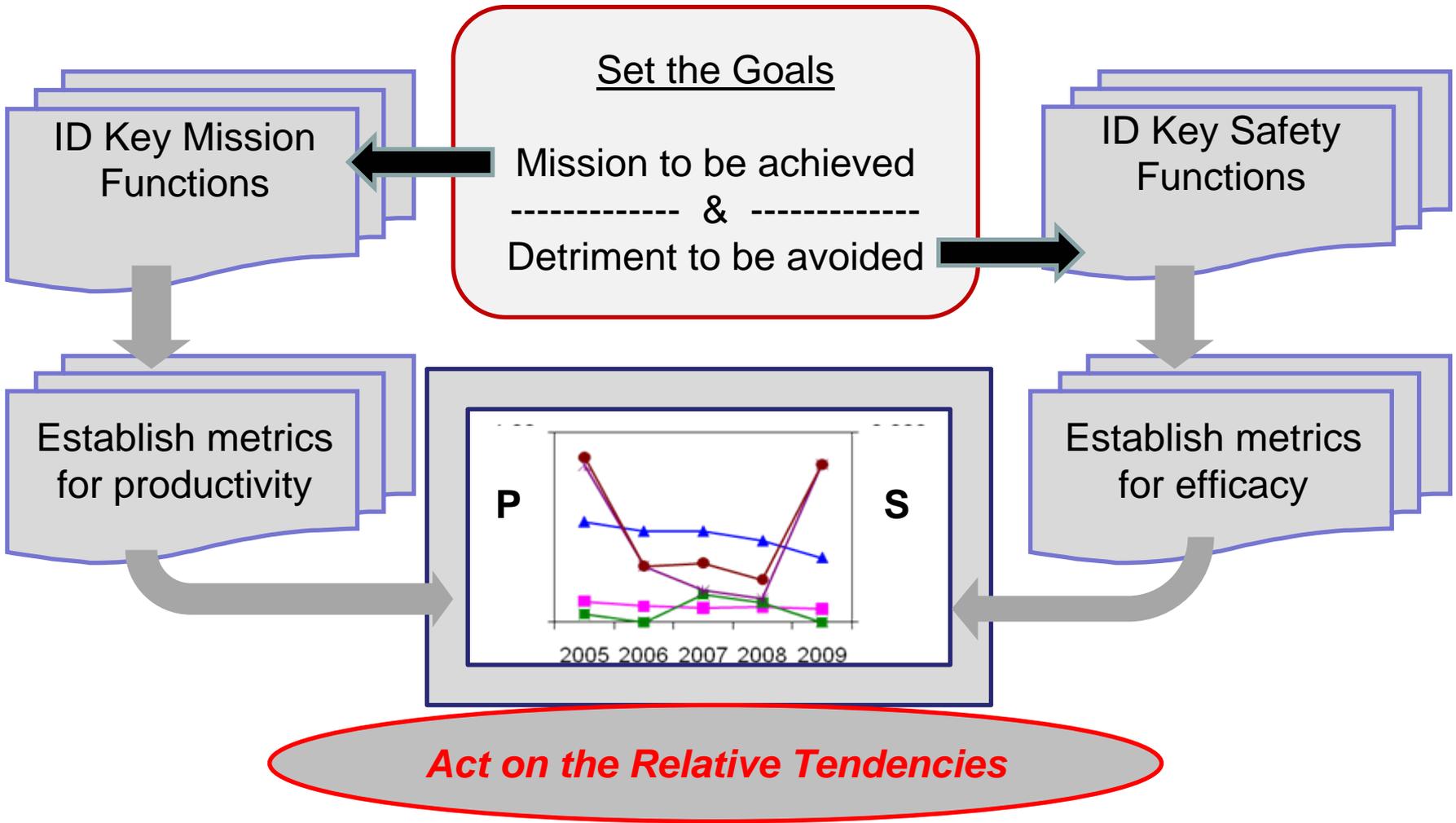


The Board encourages the use of leading indicators that

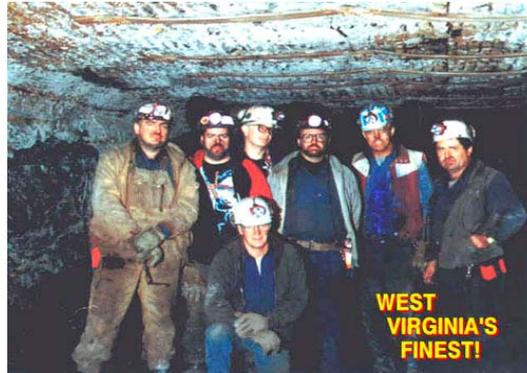
- Consider relative trends between safety and production
- Receive full senior management attention and support
- **Lead to “actionable” conclusions**
- **The value of a leading indicator is based on the strength of its association with the detriment to be avoided**



# Leading Indicators



# Awareness, Assurance, Oversight



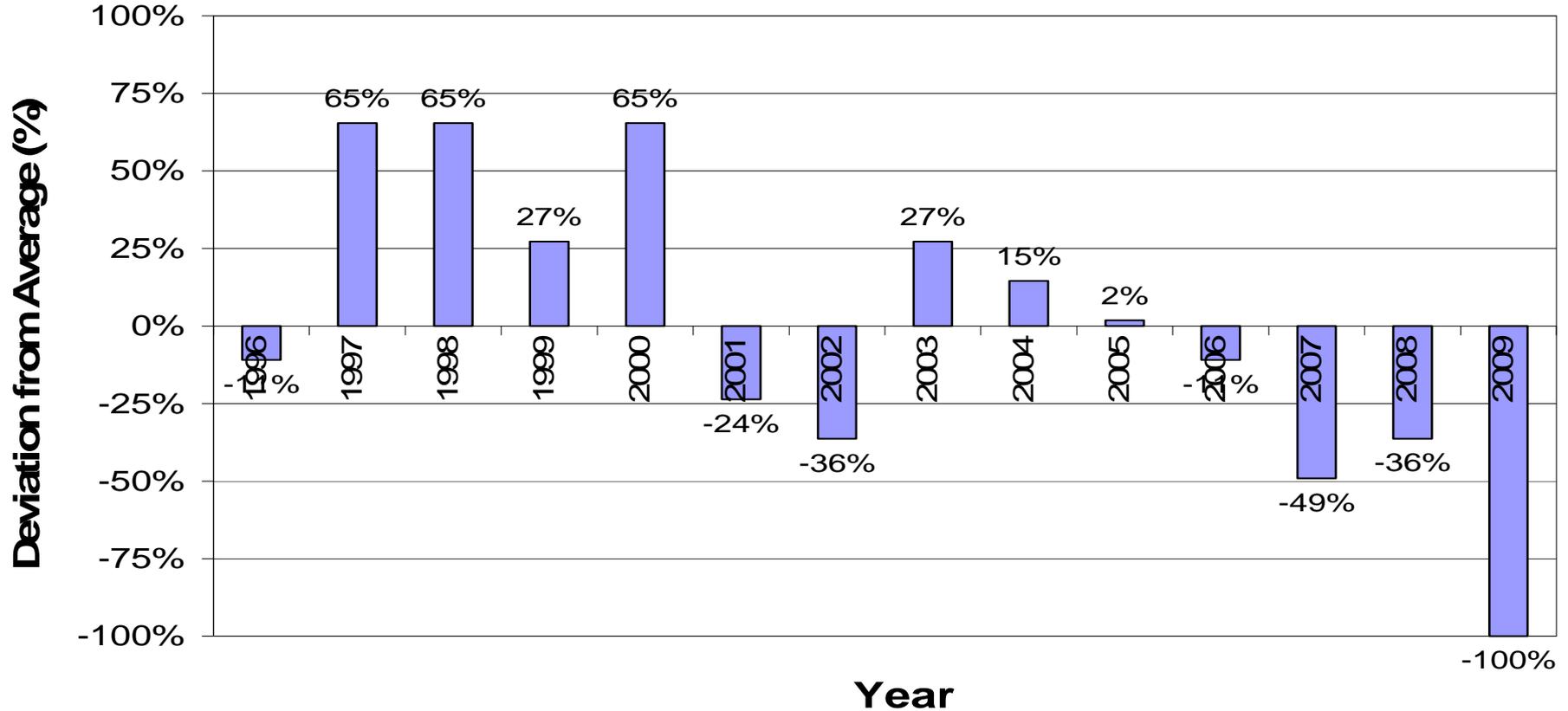
- Recent major accidents have implicated inadequate oversight
- Awareness, assurance, and oversight are vital management tools

**We must not relax awareness, assurance, and oversight to improve efficiency and productivity**

# Regulatory Enforcement



## DOE PAAA Nuclear Safety Notices of Violation



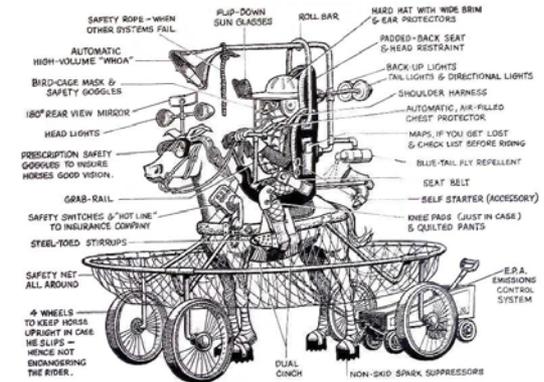
- There has been a big drop in PAAA enforcement actions since 2006
- The Board is evaluating this change in enforcement patterns

# Safety in Design

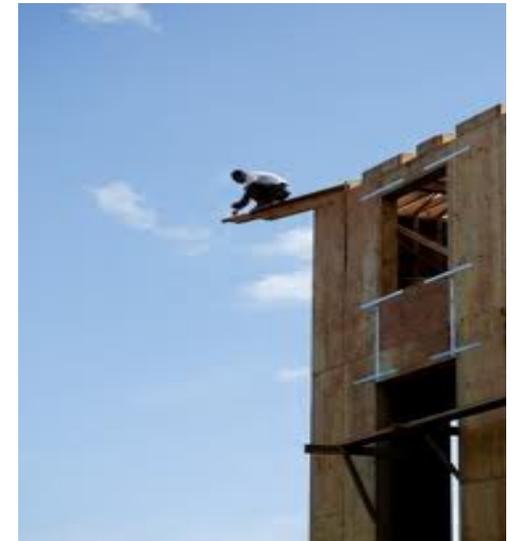


- The Board is encouraged by DOE's efforts to consider safety early in the design process
- As new missions arise, consider applying this concept more broadly in project planning
- The resulting continuity of analysis between design and operation of nuclear facilities has proven valuable
- Facility safety and worker safety are both important but must be managed separately

**Adding safety as an afterthought is inefficient and ineffective**



Cowboy after O.S.H.A. Inspection



# Nuclear Safety R&D



## The Board is concerned about DOE's lack of commitment to resolving cross-cutting nuclear facility safety concerns

- Many safety controls are conservative due to uncertainties that could benefit from further study
- Reducing uncertainties and improving understandings would improve efficiency while enhancing safety
- New missions and technologies will also introduce new hazards that will need to be studied



# Directives and Standards



## Oversight & Governance Changes

- 1991** SEN-35-91 issued, initiating modern nuclear safety within DOE
- 1994** 1<sup>st</sup> DOE Nuclear Safety Rule issued
- 1995, 2009** DOE studies external regulation
- 1995, 2002, 2005, 2010** DOE pilots new governance models
- 2000** NNSA formed
- 2005, 2010** EH/HSS new oversight models

## Major Directives Reforms

- 1991** SEN-35-91 issued, initiating modern nuclear safety within DOE
- 1994** 1<sup>st</sup> DOE Nuclear Safety Rule issued
- 1995** DOE considers shift of orders to rules
- 1995** Directives shift: 4-digit to 3-digit
- 2001, 2002, 2007, 2009** Major HQ-led streamlining reviews
- 2010** **DOE Safety & Security Reform**  
NNSA Governance/Contract Reform

## Selected DNFSB Recommendations

- 90-2, *Codes & Standards*
- 91-1, *Safety Standards Program*
- 92-2, *Facility Representatives*
- 94-5, *Integration of Rules, Orders, etc*
- 95-2, *Safety Management*
- 98-2, *Safety Management at the Pantex Plant*
- 04-1, *Oversight of Complex, High-Hazard Nuclear Operations*

**Creating a good set of standards and directives is not easy, but frequent changes cause turmoil.**

# Conclusion

---



- The pathways to new missions have not been charted; navigational aids are needed
- Many of those navigational aids exist within your ISM toolbox and DOE's framework
- Some tools, such as leading indicators and metrics need to be aggressively deployed
- Leadership and culture are the foundations of safety and mission accomplishment; we must learn to manage them
- Directives and governance reform may be necessary, but they should only be done with great caution
- Nuclear safety research and regulatory enforcement are important functions that need renewed attention

