

ASQ New Orleans Section Meeting 1518
Tuesday, April 12, 2005



An Evolving Safety Management System

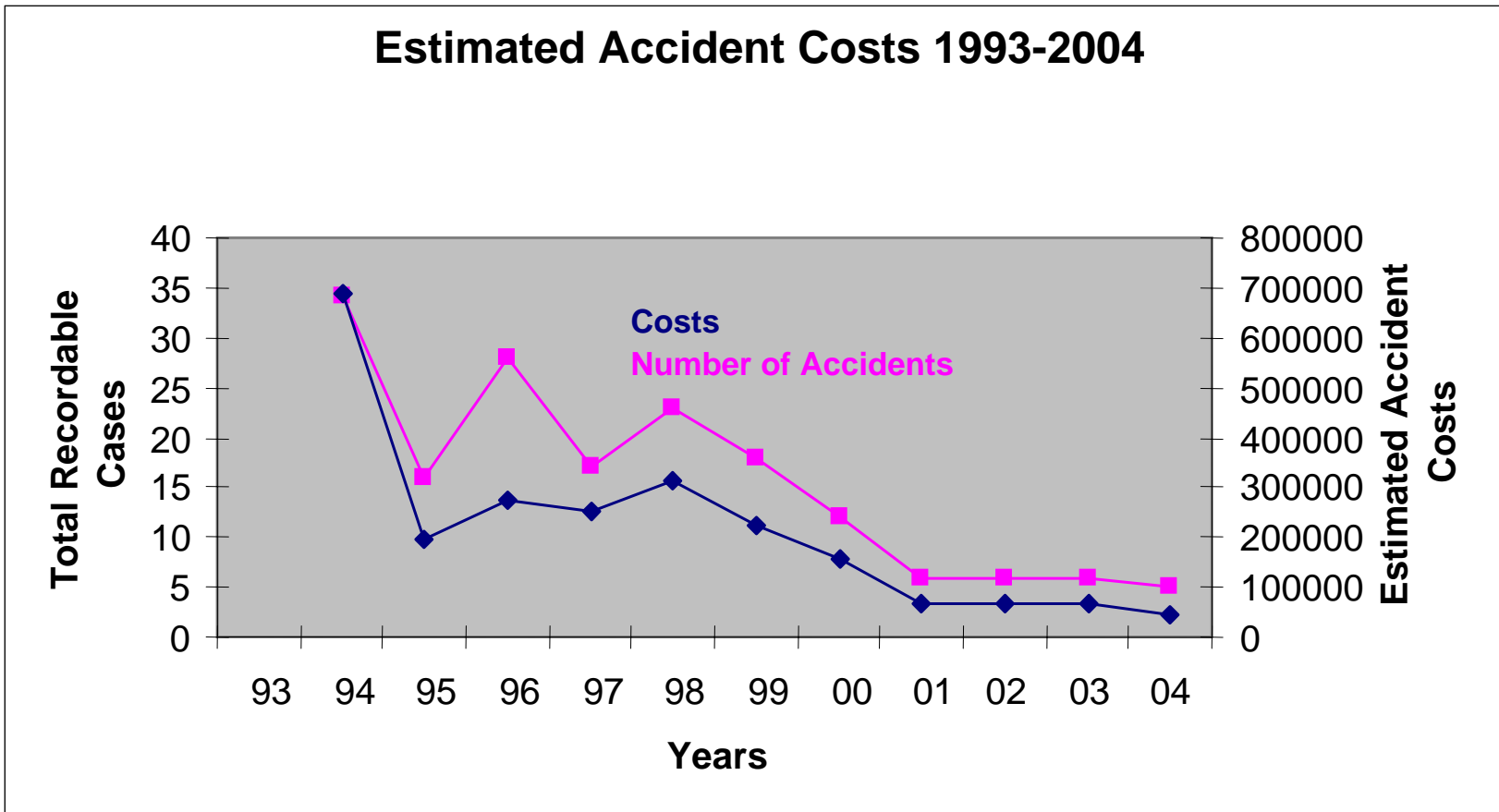
Suzanne Broussard
Safety and Health Manager
DynMcDermott Petroleum Co.



Integrated Safety Management Systems

- **DOE mandate**
- **DM preference – just good business**
- **Total integration with business systems**
- **Management by data**
- **Verification by benchmarking and self-assessment**
- **Validation by recognized external experts**
- **Highly effective**

Reduced accidents contribute to the bottom line...

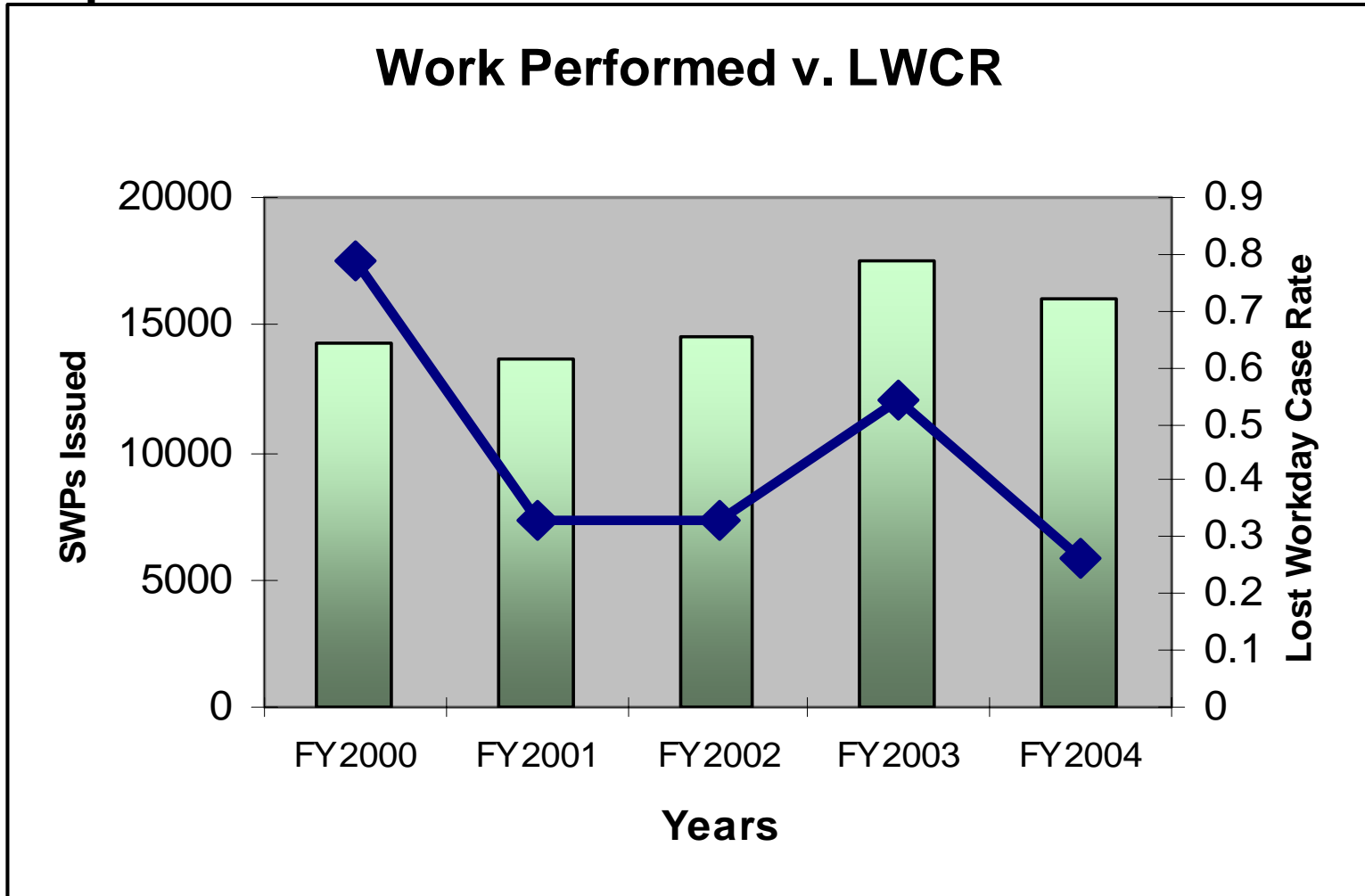


Integration with what business systems?

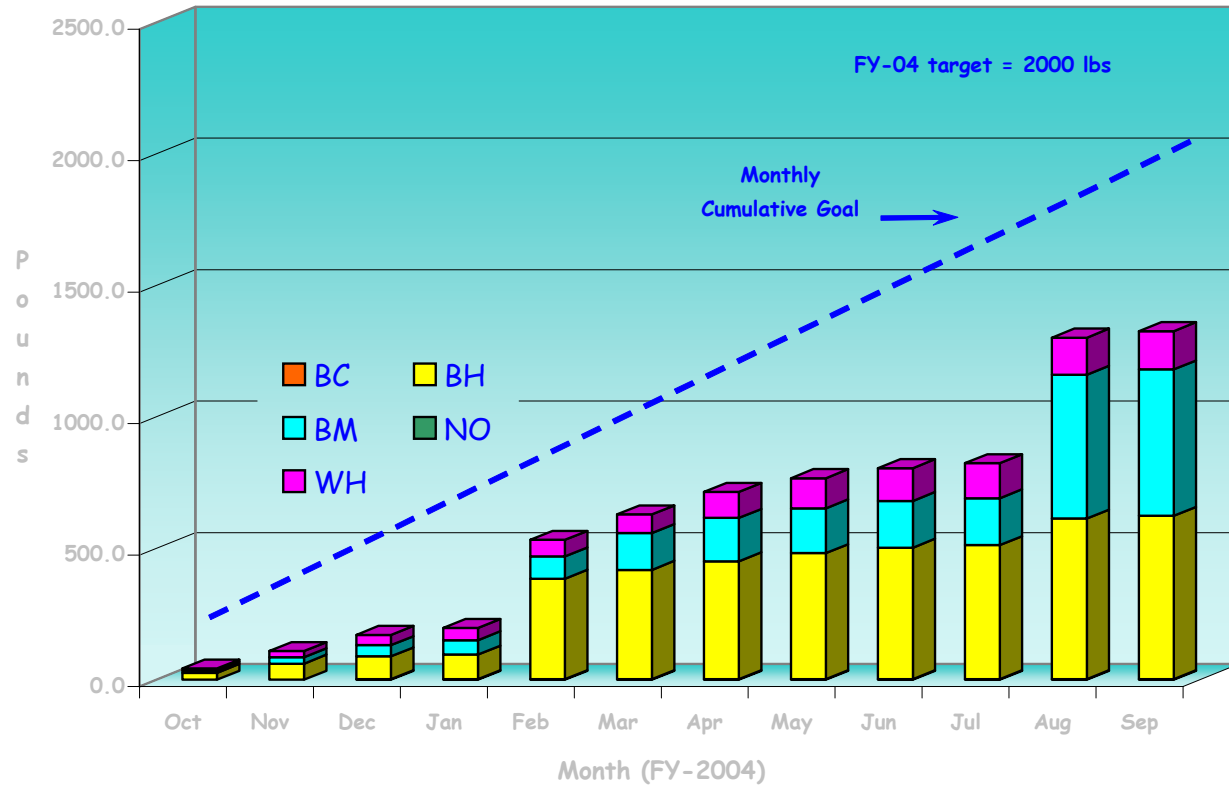
- Strategic Goals and Planning
- Finance
- Resource Prioritization – risk management
- Work scheduling and conduct
- Human Resources
- Workers Compensation
- Change control
- Knowledge control
- Performance assessment...



Quantitative data used to analyze and verify ISM compliance



Included Environmental performance...

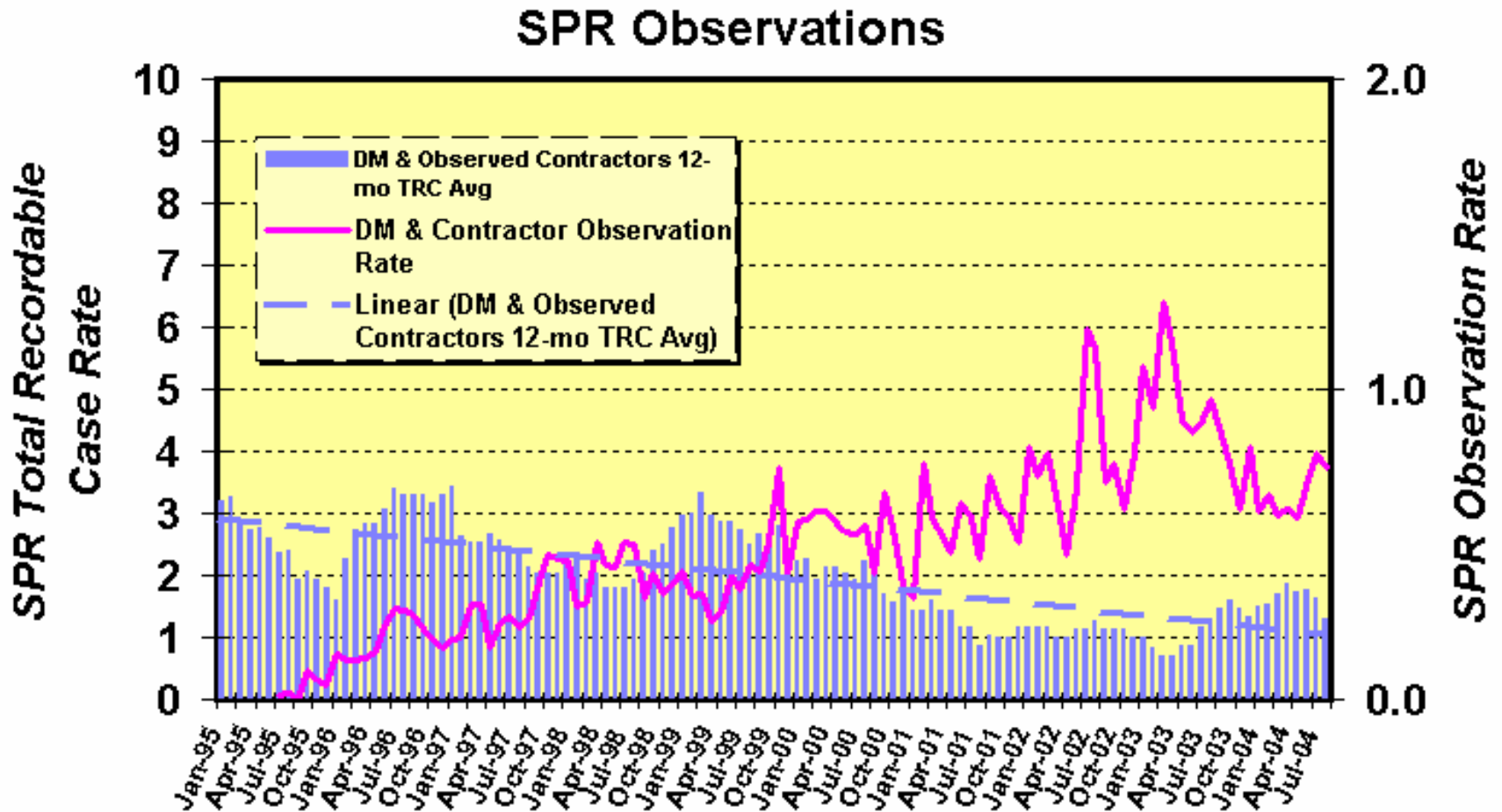




Behavioral Safety....

- First attempt to change the safety paradigm
 - Data specific to people affected
 - Peer-to-peer observations and interaction
 - Proactive data
 - Immediate results
 - Clearly demonstrated relationship – observations to accident rates
- Shifted responsibility to the employees
- Resulted in a culture shift

Proactive data...

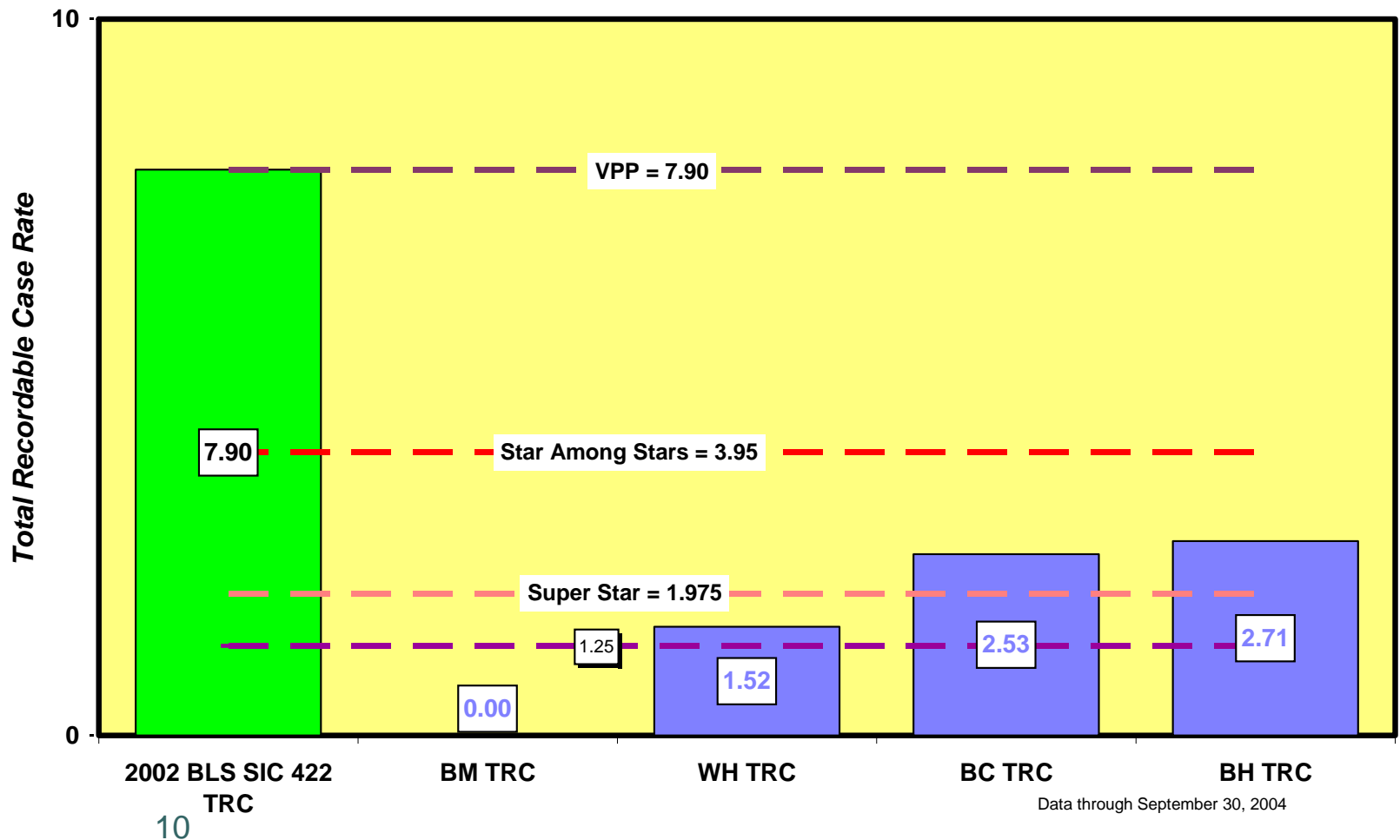


Voluntary Protection Program (VPP)

- Benchmarking against the best of the best
- Both OSHA and DOE
- Even more employee empowerment
- Demonstrated management support
- External validation
- Second culture shift
- Second significant drop in accidents



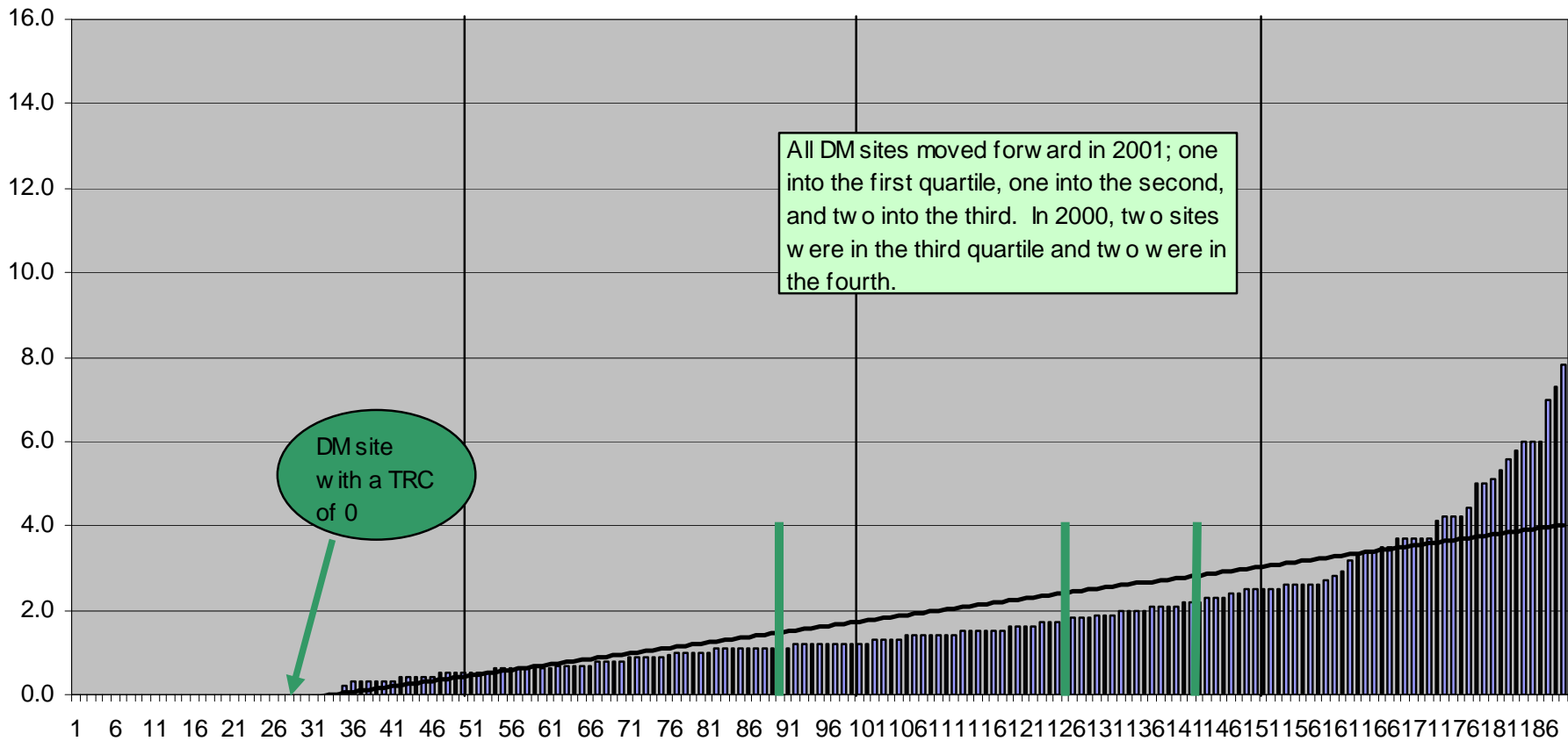
Data... Total Recordable Case Rate



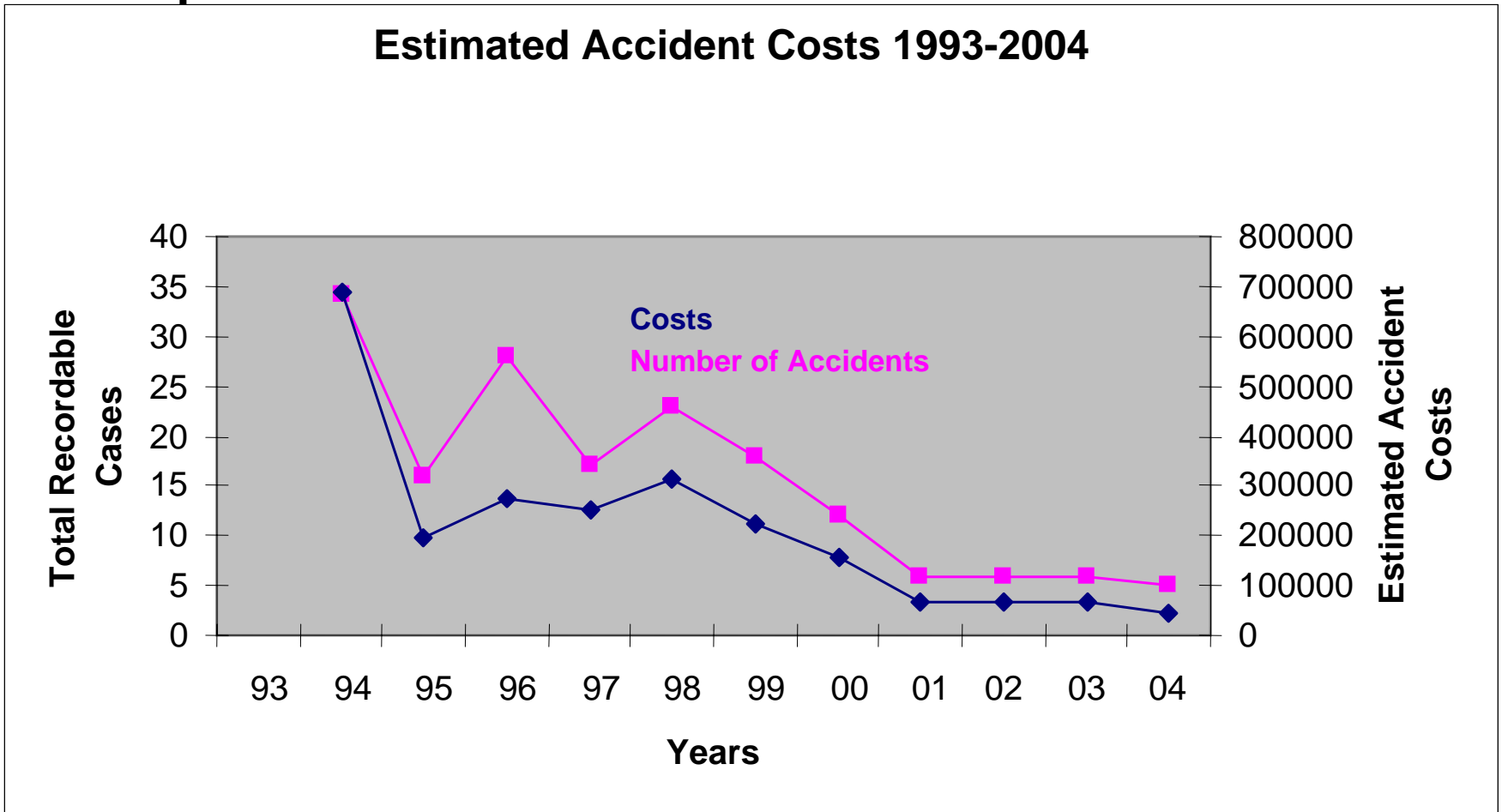
Comparison against other VPP facilities...

DM Data
Quartiles

2001 TCIR for VPP Sites in Region VI



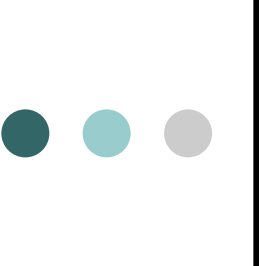
Another plateau...





The third plateau

- ISM aligned our business systems with our safety management system – accident drop
- Behavioral safety – first major decrease
- VPP – an additional decrease
- Plateau-ed again
- Getting to zero: How to cause another shift



And now...Human Performance Improvement

- Purpose – to proactively prevent events triggered by human error
- Is 99% good enough?
- Assume that mistakes will happen and have in-place barriers that will catch and correct them



Who wants to be a minimal error?

- “human fallibility is like gravity, weather, and terrain, just another foreseeable hazard. Error is pervasive...What is not pervasive are well-developed skills to detect and contain these errors at their early stages.”

Weick and Sutcliffe

Managing the Unexpected



Common traps of human nature...

- Stress
- Mental strain avoidance
- Inaccurate mental models
- Limited working memory
- Limited attention resources
- Mind-set
- Difficulty seeing one's own error
- Limited perspective
- Susceptibility to emotional/social errors
- Motivated toward goal accomplishment
- Fatigue



Patterns

Humans are notorious pattern matchers.

*Dr. James Reason
Human Error*

- According to research at an English university, it doesn't matter in what order the letters in a word are, the only important thing is that the first and last letter is at the right place. The rest can be a total mess and you can still read it without problem. This is because we do not read every letter by itself but the word as a whole.



Principles

- People are fallible and even the best make mistakes
- Error-likely situations are predictable, manageable, and preventable
- Individual behavior is influenced by organizational processes and values
- People achieve high levels of performance based largely on the encouragement and reinforcement received from leaders, peers, and subordinates.
- Events can be avoided (proactively) by understanding the reasons mistakes occur and applying the lessons learned from past events



Error or violation?

Errors are – for the most part – unintentional. It is very hard for management to control what people did not intend to do in the first place.

Dr. James Reason
Human Error

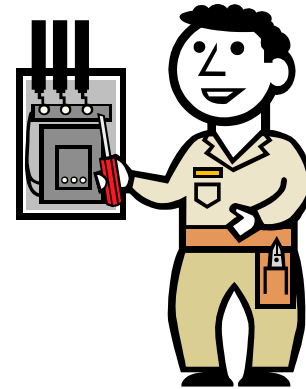
Two kinds of errors...

- **Active errors**

- Workers
- Equipment
- Immediate
- Visible

- **Latent errors**

- Managers, Engineers, Workers
- Paper, values, beliefs
- Later or delayed
- Not visible



Unsafe attitudes

- Risk perception
- Pride
- Heroic
- Fatalistic
- Summit fever
- Invulnerability
- Pollyanna
- Bald Tire



Team errors – “social loafing”

- Halo Effect
- Pilot/Co-pilot
- Free Riding
- Groupthink
- Risky Shift





Strategic Approach



- Anticipate and prevent active error at the job site
- Identify and eliminate latent organizational weaknesses

Erroneous Belief

People are always able to distinguish right from wrong and that people lack proper motivation when they act carelessly or without clear judgment.





Identify error precursors

Work Environment

- Time pressure
- High workload
- Simultaneous, multi-tasking
- Repetitive actions
- Irrecoverable acts
- Interpretation requirements
- Unclear goals, roles, & responsibilities
- Lack of or unclear standards
- Distractions/interruptions
- Changes/Departure from routine
- Confusing display/controls
- Work-arounds; Out of service
- Hidden system response
- Unexpected equipment condition
- Lack of alternative indication
- Personality conflict



Error precursors...

Individual Capabilities

- Unfamiliarity with the task (first time)
- Lack of knowledge (mental model)
- New technique (not used before)
- Imprecise communication habits
- Lack of proficiency (inexperience)
- Indistinct problem-solving skills
- “Unsafe” attitude for critical tasks
- Illness/fatigue
- Perception of threat



Error precursors...

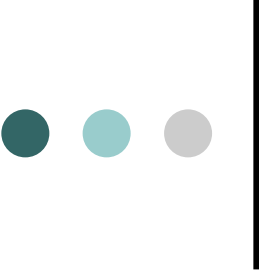
Human Nature

- Stress
- Habit patterns
- Assumptions
- Complacency/Over-confidence
- Mind-set
- Inaccurate risk perception
- Mental shortcuts
- Limited short-term memory



Desired outcomes – Highly reliable organizations

- Uneasiness and intolerance
- Error-prevention tools
- Communication
- Structured mental framework
- Defense in depth



With every problem, someone somewhere sees it coming. But those people tend to be low rank, invisible, unauthorized, reluctant to speak up, and may not even know they know something that is consequential.

***- Weick and Sutcliffe
Managing the Unexpected***