Achieving and Maintaining High Reliability through Human Performance and Risk Reduction Leadership Practices

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Biography

Darlene G. Murdoch

- **Director of the SRS, Analytical Laboratories & F-Area Operations**
- **Chairman of the SRS, HPI Working Group**
- **Line Management Responsibilities for Nuclear Operations, for 20 years at SRS**
- **Worked at SRS for 27 years, and 3 years at Argonne National Labs. A total of 30 years in Nuclear Operations**
- **Co-authored five publications, Reactor Safety System Improvements**
- **Attended the INPO Senior Nuclear Plant Management 5-week course**
- **B.S. Degree in Chemical Engineering, from the Illinois Institute of Technology**

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Risk

How to manage it

"Risk is inherent in any nuclear, chemical, and/or industrial operation. Risk is governed by the plant, the programs and the people. Engineering controls and plant design, administrative controls, programs, and training mitigate risk.

"Human Performance is another factor that enters into every aspect, can reduce risk and achieve high performance."

-- Darlene Murdoch
August 2009

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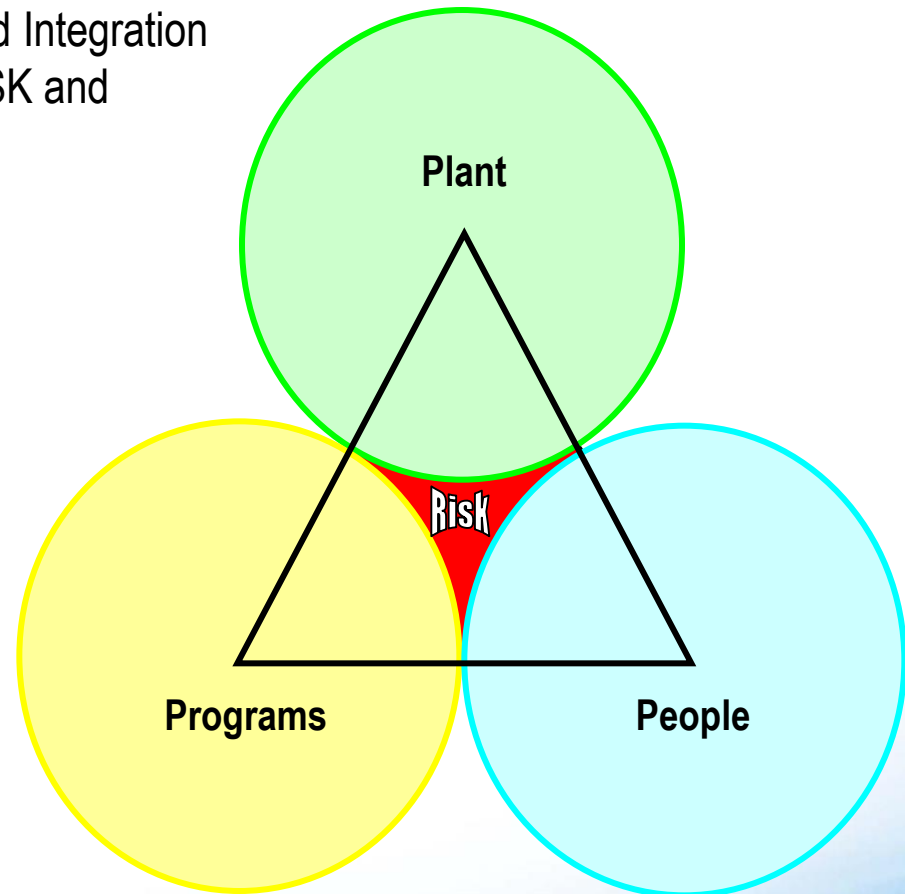# There Must be BALANCE – Risk vs. Plant - Programs - People

Overlaying Human Performance Concepts and Integration into existing processes effectively reduces RISK and achieves High Performance

And this is HOW………………

Reducing errors (Re) and Managing defenses (Md) leads to Zero Significant injuries & events (Oe).

Re + Md ⇨ Oe

Plant

Risk

Programs

People

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Effective Plant Leadership Must Consider:

Plant

- Plant Design
- Ergonomics
- Programs and Procedures
- Maintaining the Plant
- Human Interaction

Programs

- Human Performance Elements & Reminders (ISMS)
- Training & Procedures
- Self-Assessments
- Corrective Action Program (MRT & CARBS)
- Trending programs
- Fact Finding
- Lessons Learned

Leaders take it seriously!

People

- Last Line of Defense
- Must be Trained
- Need Positive Reinforcement
- Need Tools
- Need Reminders
- Need to be Aware
- Need a Just Culture
- Must have Personal Accountability
- Must get Feedback

Leaders must take action!

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The Leader (subset)

- People achieve high levels of performance based largely on the encouragement and reinforcement received from leaders, peers, and subordinates

- Leaders influence the Plant, the Programs, and the People

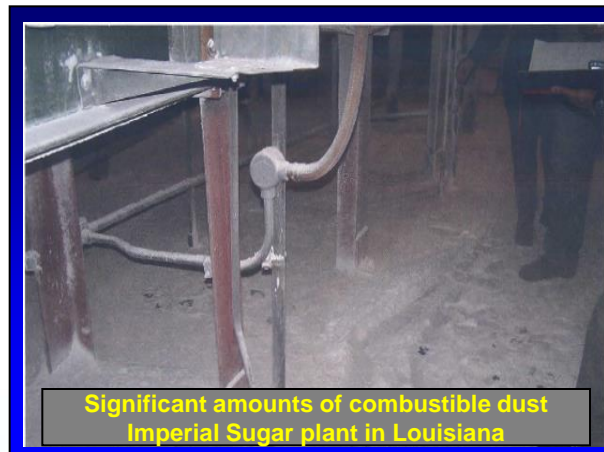- Leaders influence the Culture

- How leaders IMAGINE work is being done
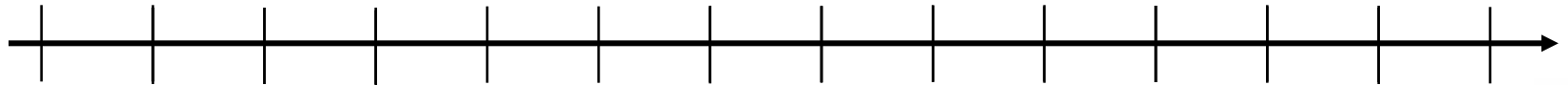
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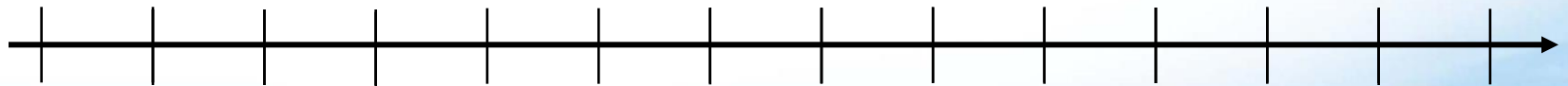
How work IS being done

How Work IS Being Done

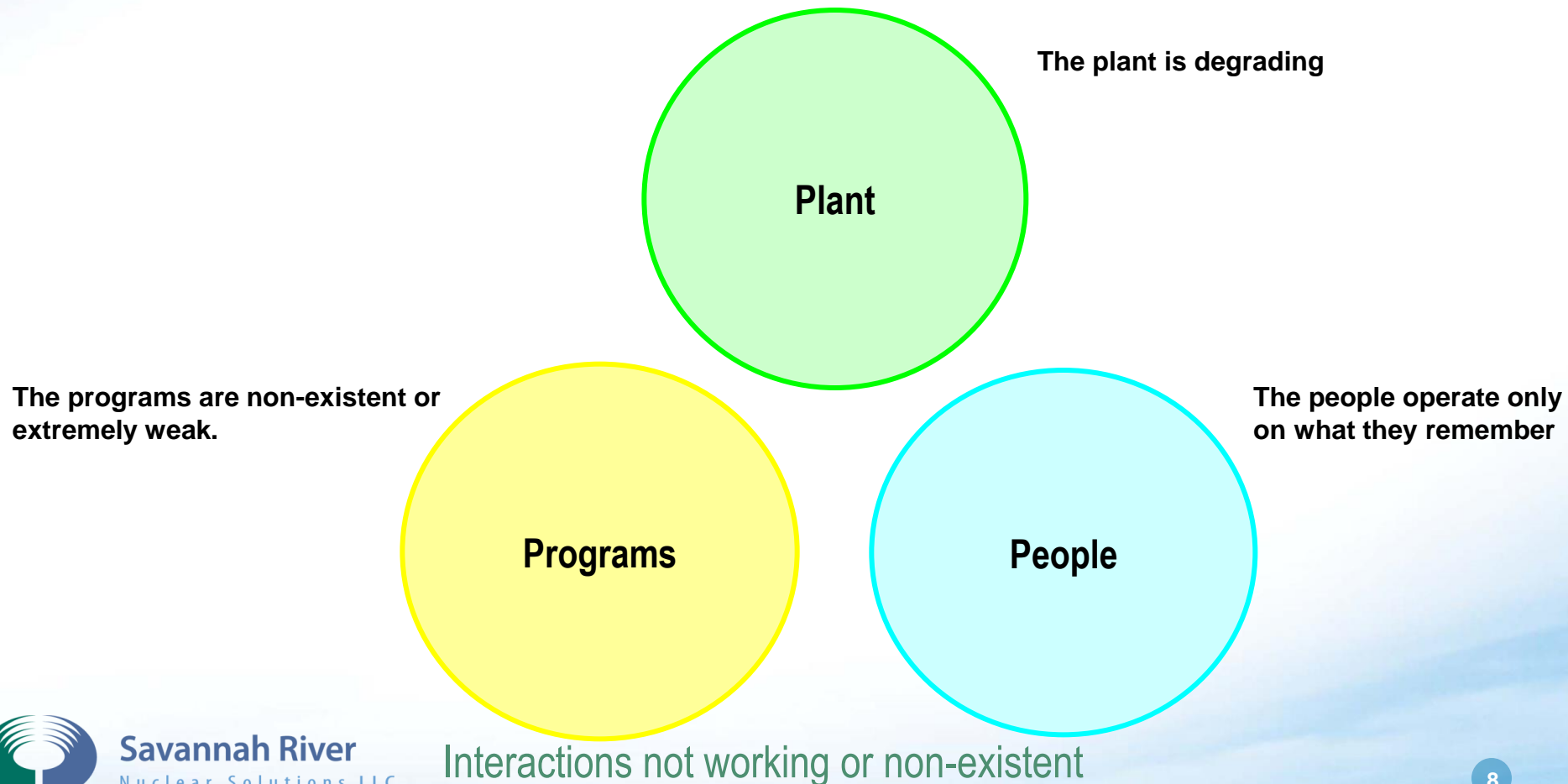Significant amounts of combustible dust
Imperial Sugar plant in Louisiana

When disaster occurs….

- Leaders are not paying attention, ignoring indicators, and/or negligent
- No one is checking
- A number of insignificant errors can lead to a disaster

The plant is degrading

Plant

The people operate only on what they remember

The programs are non-existent or extremely weak.

Programs

People

Interactions not working or non-existent

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Disasters- Case Studies

- Crash of Eastern flight 401,

  December 1972

- Bhopal, December 1984

- Exxon–Valdez ran aground,

  March 1989

- Chernobyl, April 1986

- Challenger, January 28 1986

The crew of the *Challenger*'s final flight.

Trying to Achieve High Performance

- **Determine what's needed and what are the issues**
  - Assessments (training, ConOps, chemical management, technical capabilities, etc.)
- **Can the organization determine what's needed and handle the issues?**
- **Balance between staff members and expertise**
  - Does it exist?
  - Can it be created?
  - Is change necessary?

Assess, Assess, Assess ➡ **Evaluate** ➡ **Prioritize** ➡ **Execute**

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People

A culture must be in place for people to feel free to report errors and conditions. Errors are trended and conditions are corrected.
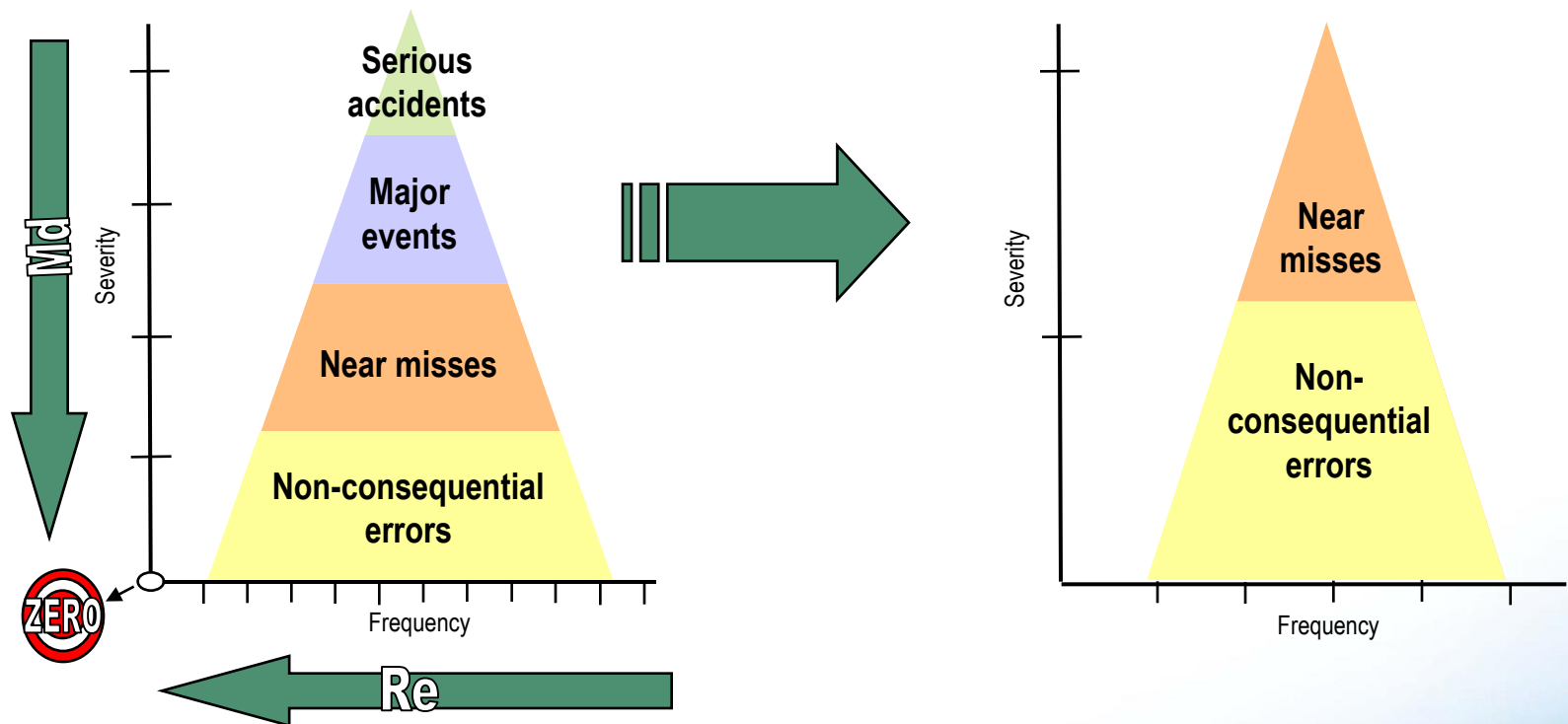
Just Culture & Reporting

Learning is key

- **Encourage reporting**
  - Value errors as leading safety data and indicators.

- **Create and sustain a "just" work environment**
  - Don't punish errors
  - Hold individuals accountable

- **Learning organization**
  - Create opportunities for observation, reflection, and feedback

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Why Implement Human Performance Tools?

A healthier workplace

- **Cost-effective results**

- **People are more confident**
  - Plant
  - Programs
  - Leadership

- **People are happier**
  - Better work environment

- **Reduces risk and achieves High Performance**

And it's nothing new !

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Implementing HPI

A way of doing business

- **HPI is not just training**
- **HPI is not a program**
- **It is a way of doing business that includes:**
  - Behavioral observation and walk-around
  - Conduct of Operations
  - Work Management
  - Systems and program development with integration of HPI Tools
  - Simulations and training (drills)
  - Leadership
  - Error Reporting
  - Corrective Action Program
  - Event investigation and lessons learned
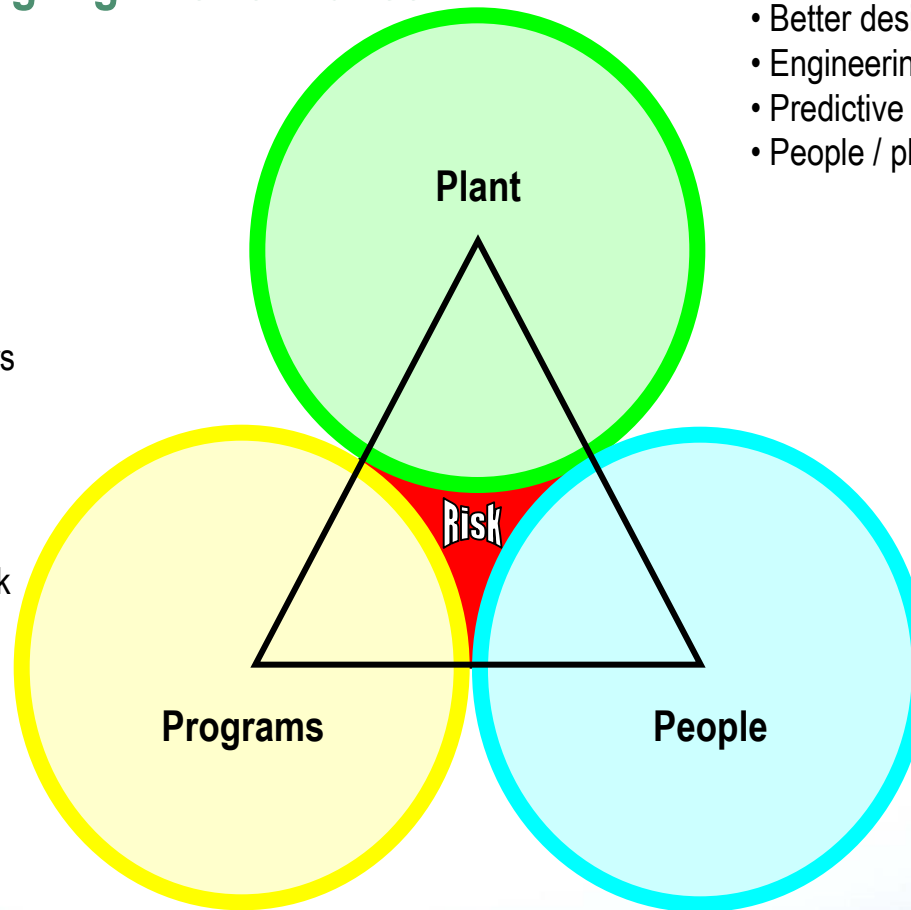 - Feedback

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Reducing Risk by Seamless Integration

Better all around
Start Achieving High Performance

Plant
- Better designed plants
- Engineering controls
- Predictive maintenance
- People / plant interface

Programs
- Corrective Maintenance
- Preventive Maintenance
- Better documents for workers
- Error reporting
- Observations
- Corrective Action Program
- Event investigations
- Lessons Learned & feedback
- BBS / HPI
- Metrics

People
- Training
- Just Culture
- Self-Assessments
- Work gets done safely
- Personal satisfaction
- More confident
- Learning organization

Plant

Risk

Programs

People

What gets measured, gets done!
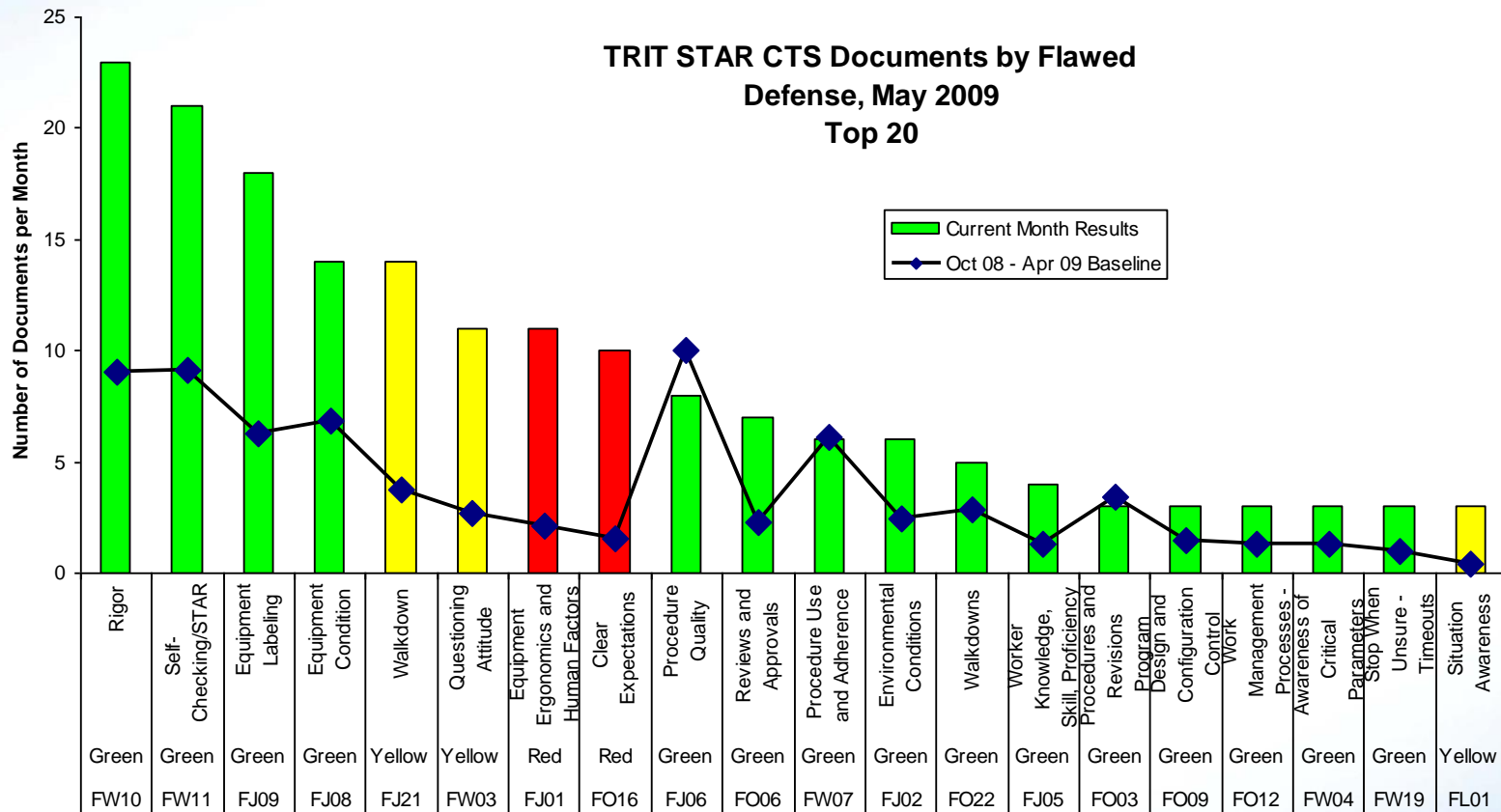
SRS HPI Implementation

Completed:

- ✓ Training of all Site employees
- ✓ 9/9 Error Reduction Tools
- ✓ 18 Days of Excellence
- ✓ Matrix
- ✓ Safety Conference
- ✓ Gap Analysis
- ✓ HPI Steering Team Charter
- ✓ HPI Oversight Structure
- ✓ Site HPI Procedure

- ✓ HPI Training Material
- ✓ Site HPI Communication Posters
- ✓ HPI Web Page
- ✓ Disciplinary Process
- ✓ Fact Finding/Post Job Review
- ✓ Corrective Action Process & Error Coding
- ✓ Pre-job Briefs Checklist
- ✓ Work Control Guide
- ✓ HPI Booklet
- ✓ BBS / HPI Integration

Working:

- ➢ Error Reporting & Trending
- ➢ HPI Metrics
- ➢ Self-Assessments (MFO, SSW, etc.)

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Trending from Error Reporting

TRIT STAR CTS Documents by Flawed Defense, May 2009 Top 20

Remember the Past

Excel in the Present

Anticipate the Future

Continuous Improvement…