

22ND ANNUAL

THE ABC'S OF LEAN: TRANSFORMATION THROUGH
ACTIONS, BEST PRACTICES AND COACHING



22ND LCI CONGRESS
OCTOBER 19-23

Improve Safety through Lean

OCTOBER 19, 2020



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Lean Construction Institute



Provider Number H561

Improve Safety Through Lean
LCIV.STL

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Monday, October 19, 2020



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Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.

Course Description

The Safety and Lean course includes the following elements:

- Behavior-based safety culture
- Lean principles & tools for improving safety
- Making things visible
- Getting everyone involved
- Getting to root causes of problems in safety
- Using metrics to build a safety culture
- The role of standardized work
- Learning through actual scenarios.

Learning Objectives



01.

Participants will recognize and understand Lean tools and techniques that promote safety, including 5S and Root Cause Problem Solving.



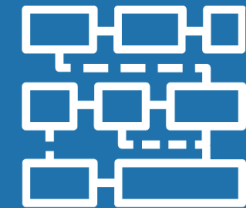
02.

Participants will recognize and be able to analyze the role of standardized work.



03.

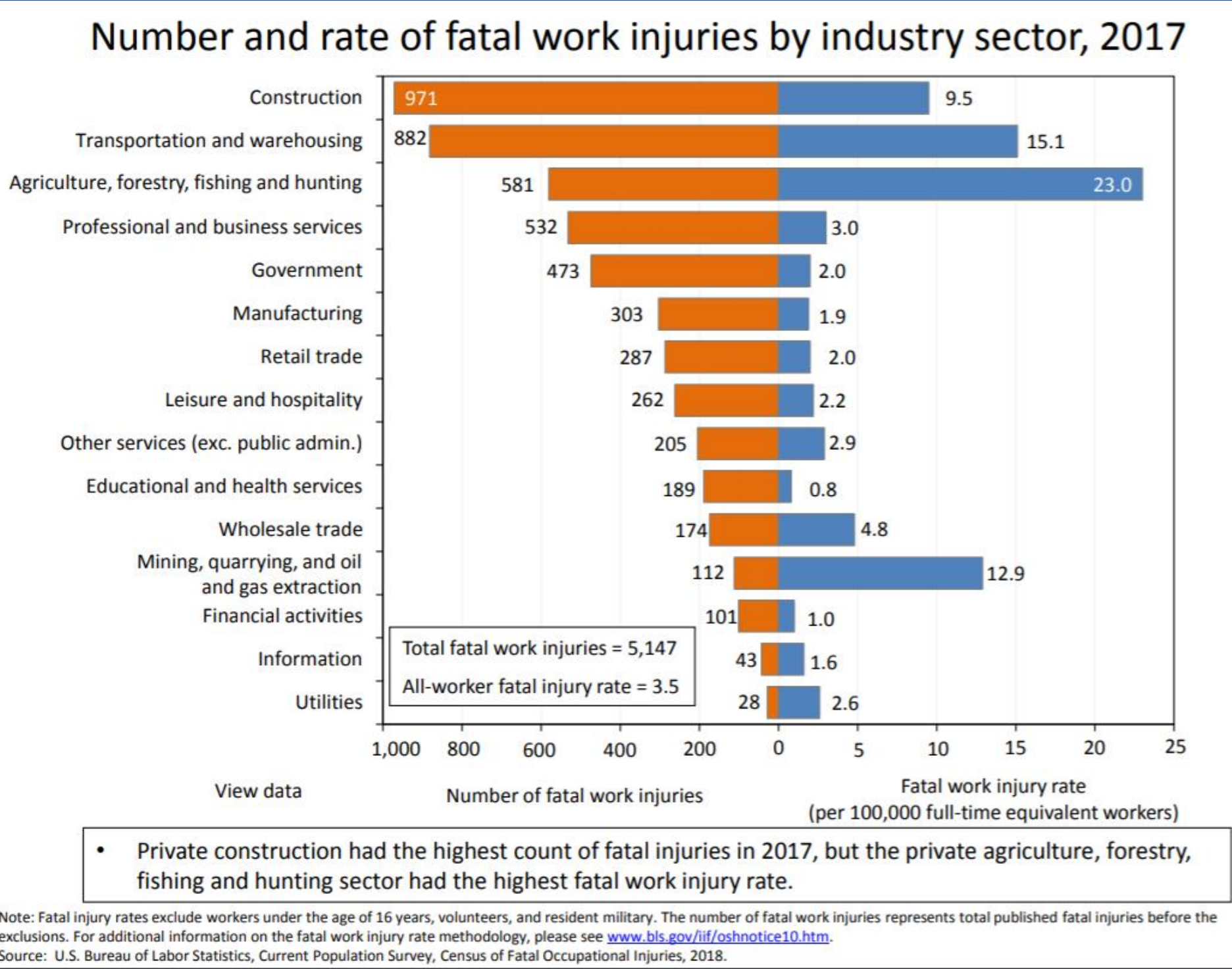
Participants will discuss using metrics to build a safety culture within a project team and larger organizations.



04.

Participants will discuss real-life Lean safety scenarios for the purpose of demonstrating an understanding and ability to analyze Safety through Lean practices.

Why talk about safety?

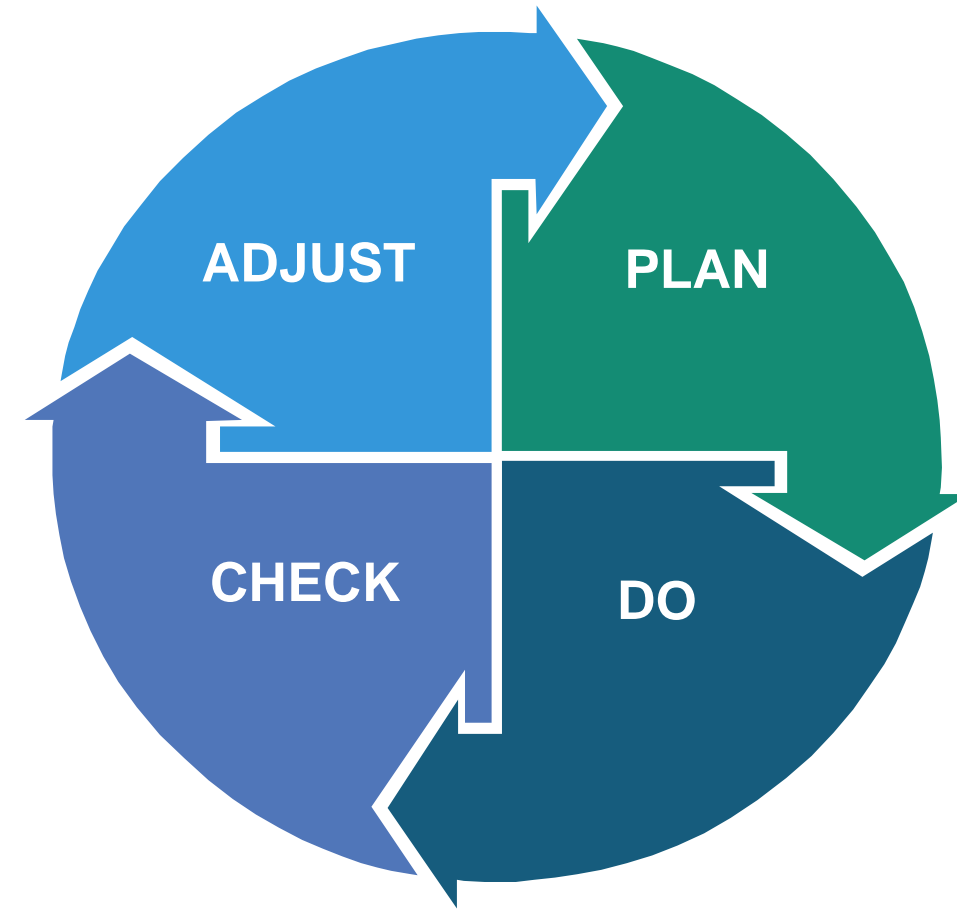


Lean is a proven approach to:

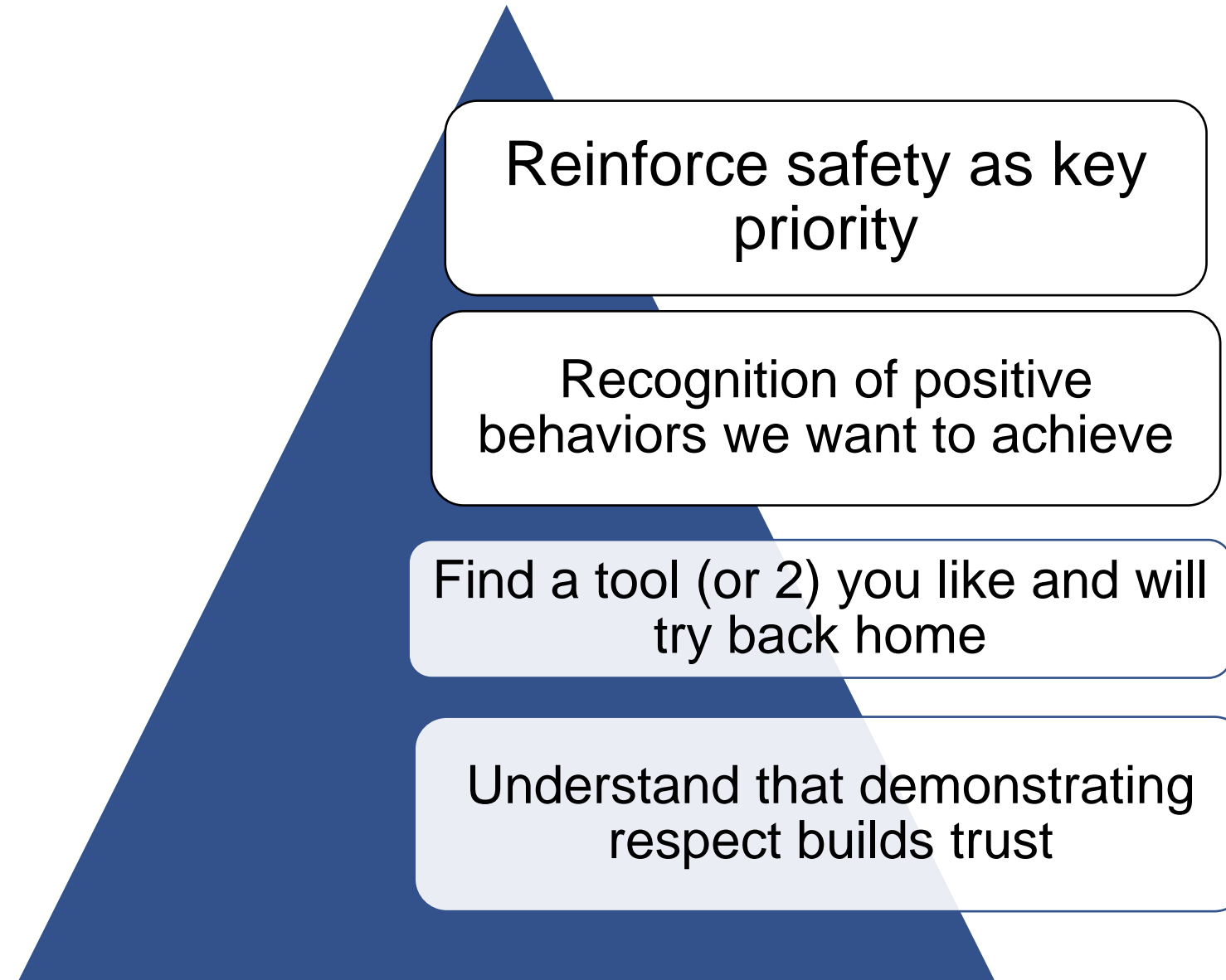
Increase **Value**

Reduce **Waste**

Respect **People**



Desired Outcomes for Today



Break-out (10 mins)

“What does an organization that values safety look like?”



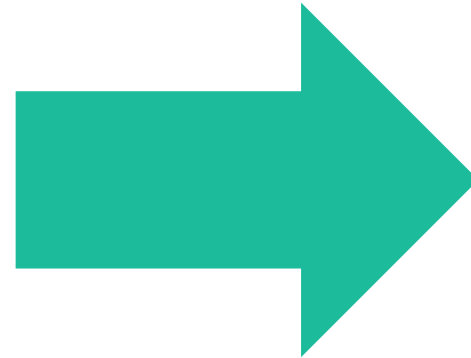
Lean Management

Hard on process...easy on people

So what should be different?

From:

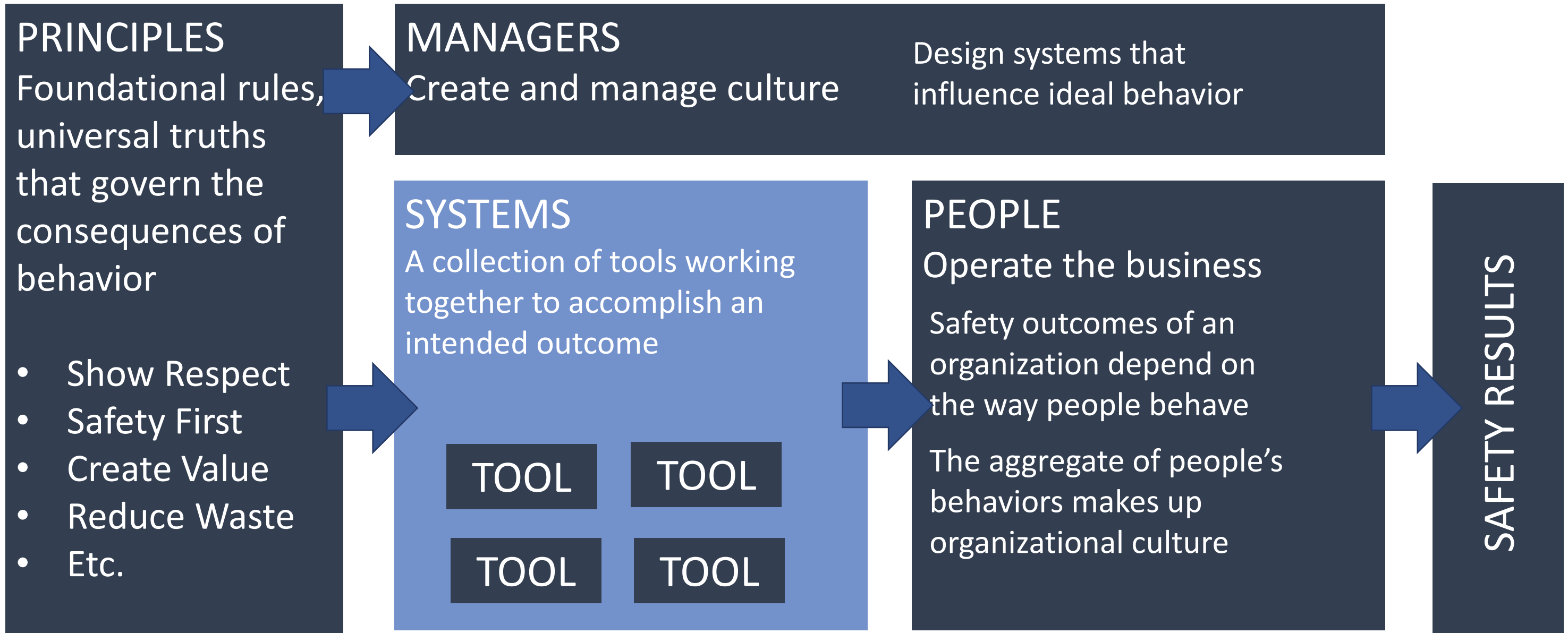
- Compliance-based
- Do after an accident or a near-miss
- Push from above
- Leader responsibility



To:

- Behavior-based
- Part of every-day work
- Pull on safety
- Everyone responsible

Safety through lean: Results, Behavior and Guiding Principles



Why Safety when discussing Lean?



85% of Lean Journeys Fail



Opportunity

Safety is a great place to start change, or anchor your Lean Transformation

Force Field Exercise

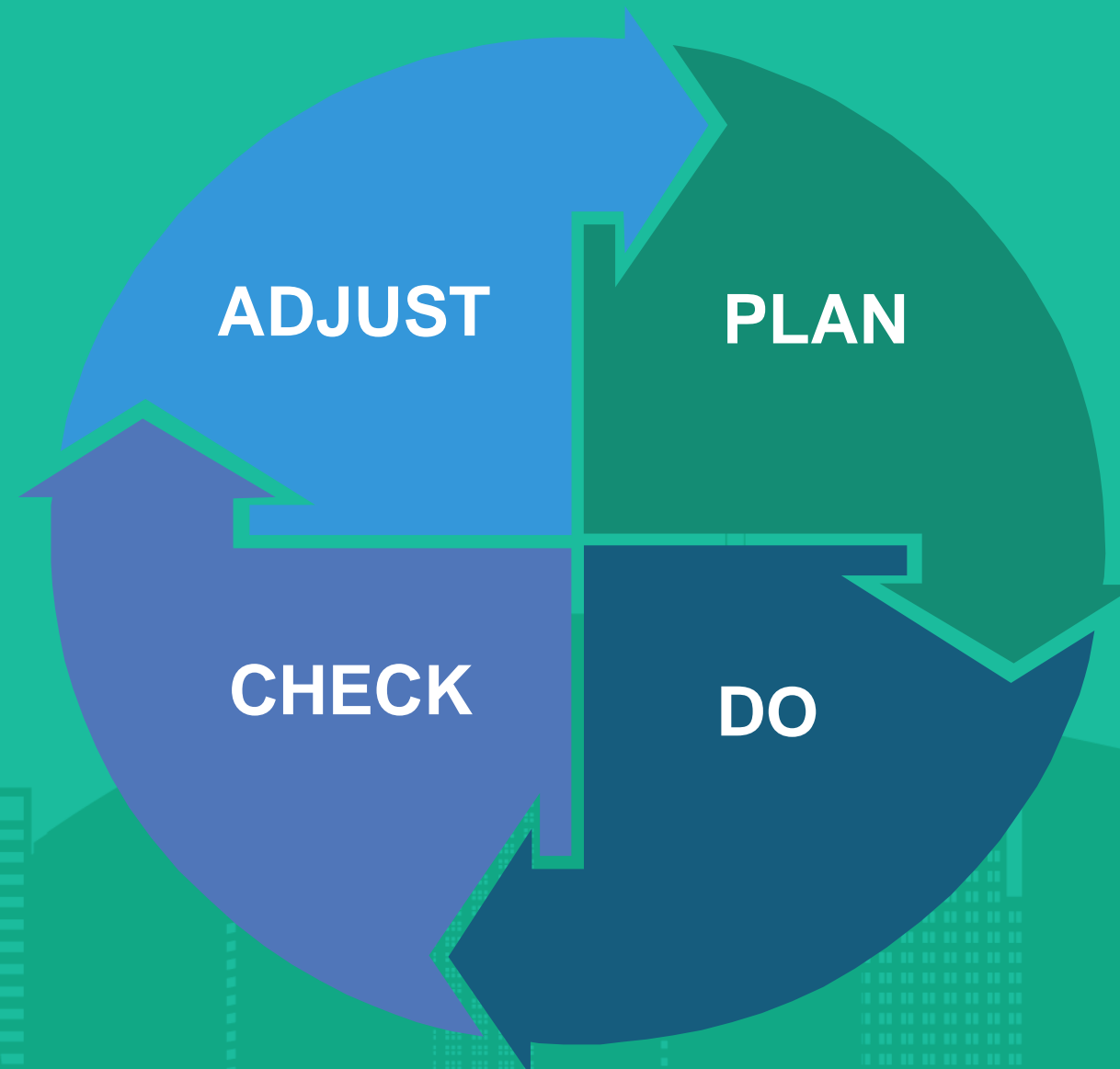
(10 mins)



Some concepts and tools we are going to be looking at today

- A3 thinking
- Metrics
- Going to Gemba
- 5S
- Visual Management
- FMEA
- Root Cause Problem Solving

A3 Thinking



Title THE DEFINING STANDARD FOR ADVANCED MANUFACTURING

Background This approximately 26,000 square foot expansion will allow AccuRounds to pursue additional revenue opportunities. The plant facility is at capacity and, as Mike Tamasi says "...has weaknesses in flow and image". Other reasons (1) low interest financing (2) persistent, attractive market for construction pricing (3) close working relationship at state & local level.

Conditions of Satisfaction/Programming



Utility Easement
2nd EXISTING PANEL



Extended curb cut at risk during site plan approval



How will new docks tie-in with existing. Plant layout out of sequence

Yet to Resolve:

- How to handle possible tenant
- On-site renewables
- Utility bills. Life cycle cost analysis
- Plant equipment
 - catalog cuts
 - new equipment has heavier stock (75 lb.)
 - material handling vs. plant flexibility (rolling gantries?)
- Amenities
- Local and State incentives

Boston Centerless Visit, 11/28

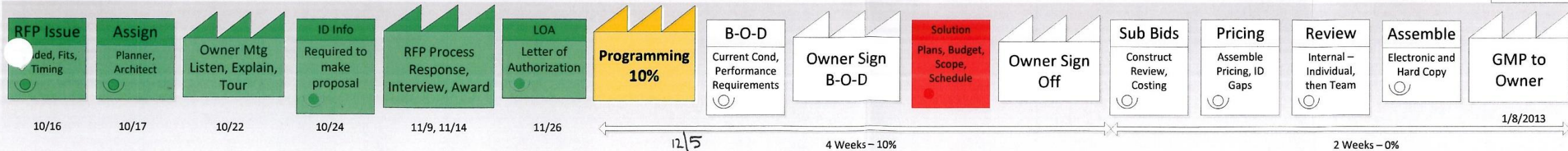
- Create a statement at reception
- Reception area has showroom element
- Consider cube standard of 6'x7'
- 50'x50' column layout helps flexibility, was a good investment
- No need for +20' ceiling height, not worth mezzanine



Budget Control

Target GMP = \$2.0M - \$2.5M vs. Current Budget Range = ??? - ???

	Risk to Budget	\$ Swing Potential	Factors	Ability to Influence
Site	High	Sal TBD, Due 12/5	Drainage, Parking, Approvals	Med
Shell	High	Sal TBD, Due 12/5	Hi-Lo, Code, Aesthetics	High
Fit-Up	Med	Sal TBD, Due 12/5	Some Office not in Control Budget	High
MEP	Low	Sal TBD, Due 12/5	New Electrical Feed, Mods to Existing	Low
Exist Condition	Low	Sal TBD, Due 12/5	Code Interpretation	Med

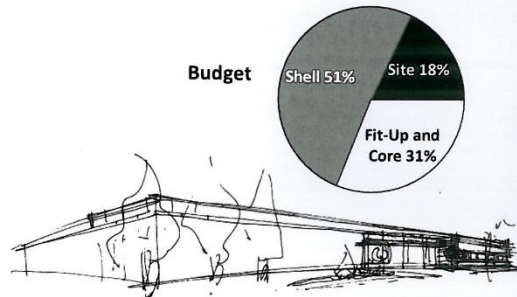


DACON design . architecture . construction

AccuRounds Accuracy on the cutting edge.

NM MT SB MB DM MT MT MT BF MT Version Date: 12/04/2012

Design Solution



Design Decisions/Paths In Place

- Addition Height – Match approx. 18' of existing Avon warehouse
- Mike's office – large enough to accommodate 4-top roundtable
- Use lean charette (3P Planning) for office layout. Engage GBMP for 3P
- IT consultant will directly contract with AccuRounds – Dec/Jan study
- Mike to work with GBMP for new plant layout. Jan 2013.

Activities and Assignments

	Primary	Supporting	Start	Finish
Engage Civil Engineer	Sal	Dennis & Bob	11/30	12/14
Head Count	Mike	AccuRounds Staff	11/30	12/4
Lean Office Layout, 3P Plan	Mike & Nick	AccuRounds Staff & GBMP	11/30 12/14	12/4
Equipment Matrix	Mike	Patrick	12/30 11/30	12/21 12/7
Exist Code Compliance	Dennis	Bob	12/6	12/13
Meet with PV Supplier	Mike	Sal	12/6	12/13

ELECTRICAL SERVICES.

Legend

Assure Quality at the Source

- Condition Satisfied
- Unclear or Problem
- Stop and Fix

Dacon's Value Stream

- Do Not Pass Defects
- Stop and Fix Problems
- Respect the Individual

A3

A3 for Safety

1. What is the problem we are trying to solve? Why is this important?
2. Current Condition – How do things work today? What is our strategy for safety? What strengths do we have? What will inhibit achieving our goals?
<div><div>Fill in things that support achieving goals</div><div>Fill in things that inhibit achieving goals</div></div>
3. Target Condition – What kind of environment or outcomes do I want to see regarding safety? Or what is the target I want to set for myself?

Create Your Plan

Last Updated:

4. Road Map – How will I get from here to there?		How will I know we are on track (Measure of Success)		
Date	Description	Measure of Success		
5. Implement the Plan (What actions will I take to reach our next milestones? How am I doing?)				
Theme	Activities/Steps	Accountable/ Responsible	Metric/Status	Other possible columns: Start, Finish, Status, Comments
A.				
B.				
C.				
6. Continuously Improve: What is working in this plan? What do I need to change, improve?				

Metrics



Types of Metrics

Leading Indicators

- **Predictive** of future results
- **Influenceable**: You can make a difference... it's within your power

Lagging Indicators

- **Reliable**: Tells you if you have achieved a tangible objective
- **In the past**: Result that you measure ***after*** it has happened
- You can't impact the results!

Metrics Examples – Breakout (5 mins + 5 mins)

Leading Indicators

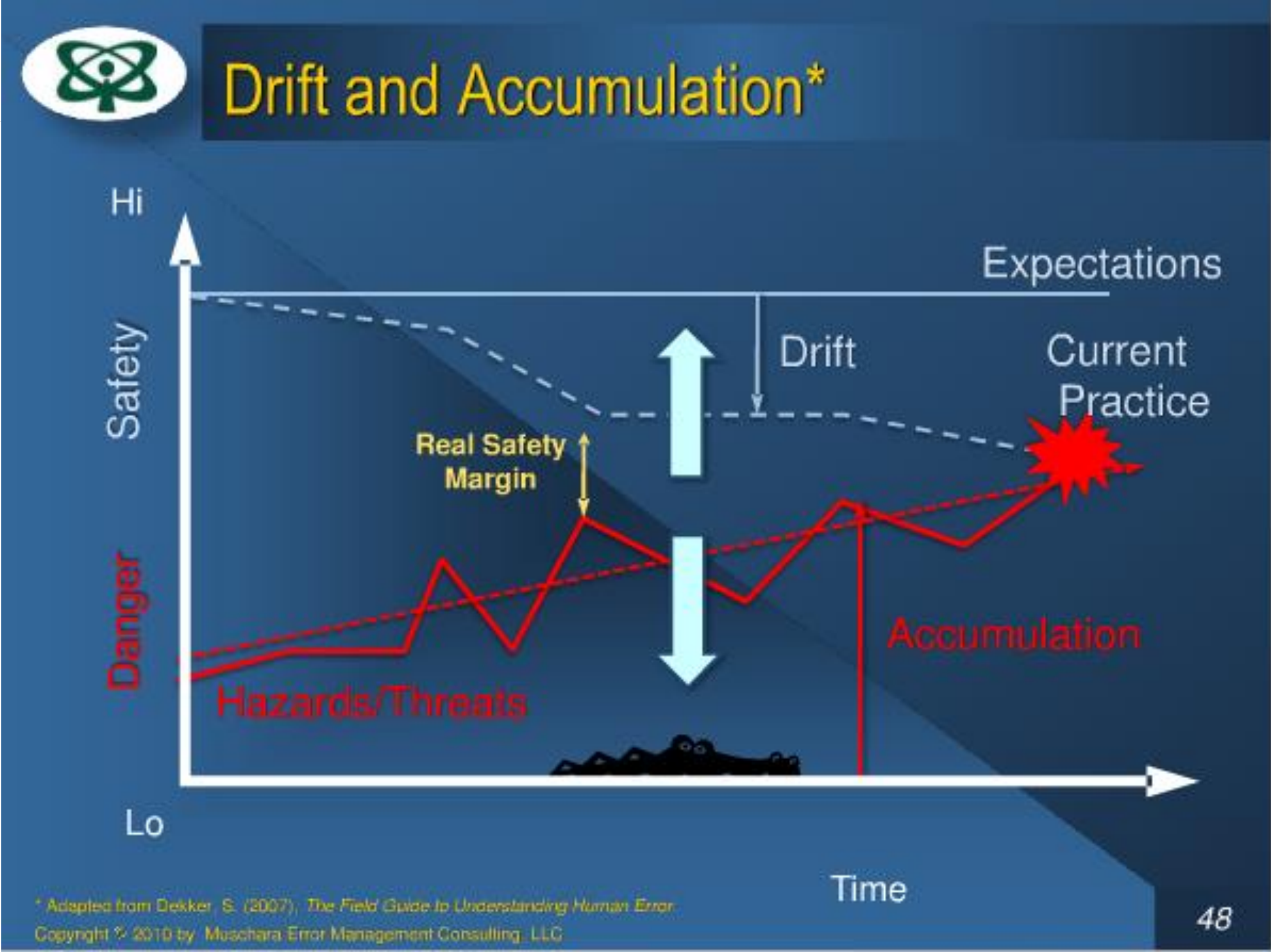
- A

Lagging Indicators

- A

Recognizing Drift, a common safety waste, and its dangers





Value of Gemba in Safety



What is the Gemba? Gemba vs. Genchi Genbutsu

Gemba, the place where work is done



Genchi genbutsu is “going to the source to check facts for yourself so you can be sure you have the right information you need to make a good decision.” One is a place, the other is an act.



As Lean Practitioners we insist on Direct Observation

Think about these statements related to the Gemba

Taiichi Ohno (architect of TPS)

- Called for a *revolution of awareness*

Albert Einstein

- “Problems cannot be solved at the same level of awareness that created them.”

Shingo (applied TPS):

- “The greatest waste is the waste we do not see.”

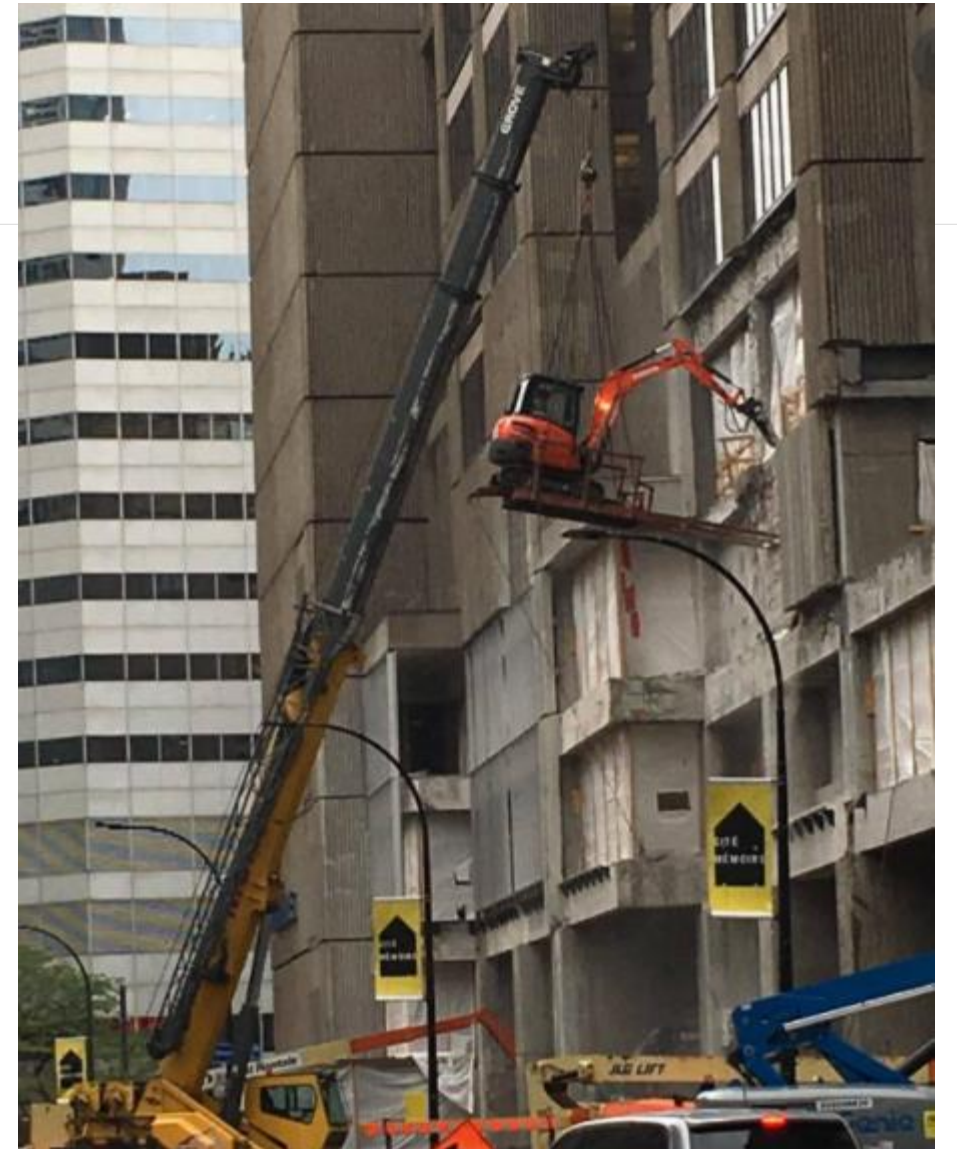
Fujio Cho (former Toyota Chairman)

- “Go see, ask why, show respect”

Sidney Dekker (Safety Expert)

- “Don’t ask questions about safety, ask questions about their work. Teach me how this is done. What concerns you about this?”

What's wrong here



How do you go to Gemba as a leader

Prepare

Identify a theme or purpose

- ☐ Strengths
- ☐ Safety opportunities
- ☐ Concern areas
- ☐ Follow up - key initiatives
- ☐ Follow up – Action Items

Identify where/when to go see

- ☐ Who do you talk to?
- ☐ Where do you go?

Communicate and observe

Before or upon arrival to the Gemba Walk

- ☐ Recap on context and prepare
- ☐ Advise those present of the purpose and intent of your walk

During the Gemba Walk

- ☐ Seek to improve & recognize, not chastise
- ☐ Observe & ask open-ended questions to identify & understand:
 - ☐ Progress on plans
 - ☐ Causes of team success/opportunity
 - ☐ Current demand & capacity
 - ☐ Good behaviors & best practices
 - ☐ Problems
 - ☐ Engagement levels with the work & with one another

Upon completion of the Gemba Walk

- ☐ Celebrate wins & positive behaviors

Reflect and learn

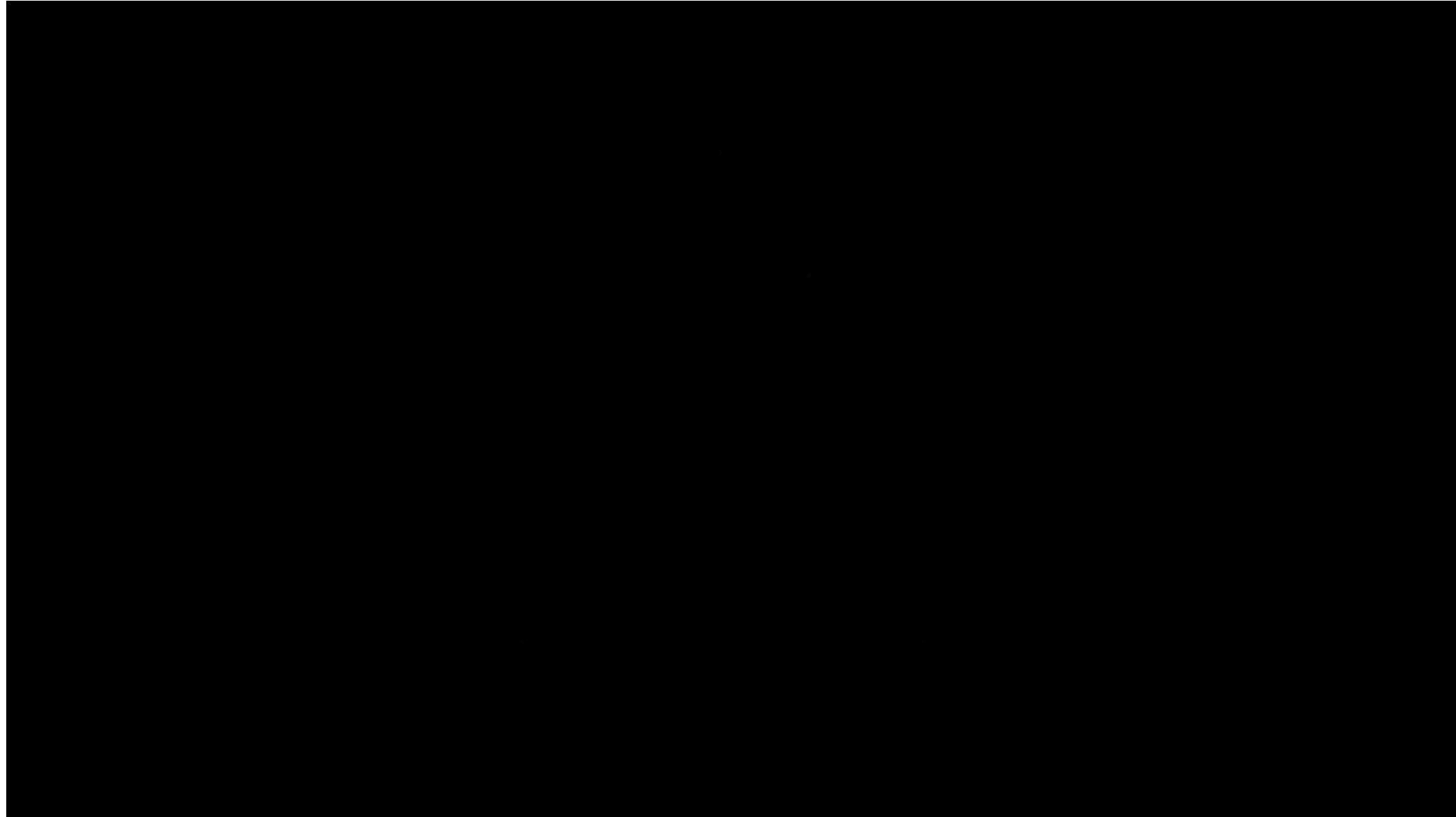
Ask yourself questions to improve

- ☐ How did I, as a leader, follow Gemba Walk Standard Work?
- ☐ How will I use the info to drive value for the team?
- ☐ What can I do better on my next floor walk?
- ☐ What commits did I make?

Take Action

- ☐ Adjust plans and actions based on learning
- ☐ Deliver coaching or feedback as necessary
- ☐ Move identified problems to Huddles or Problem Solving Sessions
- ☐ Change policies, processes, priorities, etc. as needed

Power of positive deviants



5S: Junction of Standard Work and Visual Controls



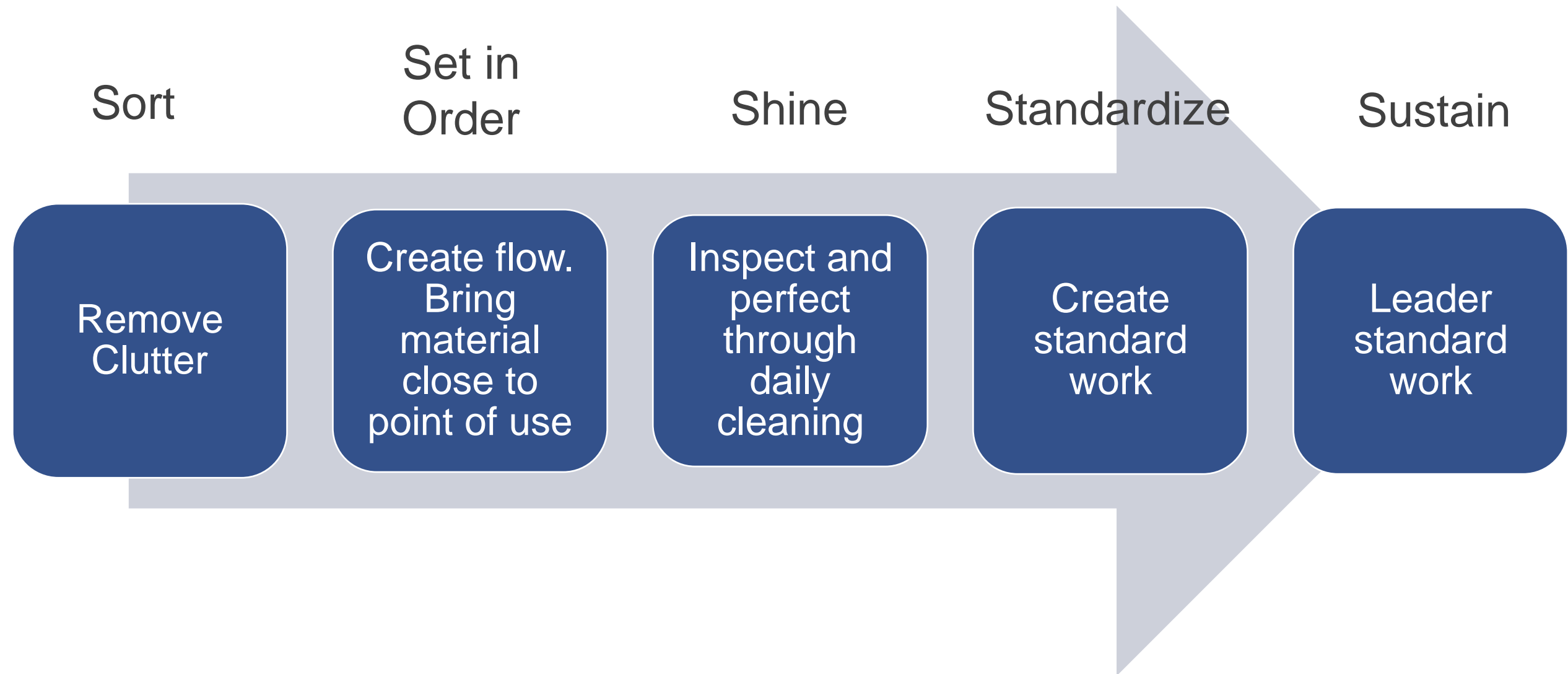
5S: What is it?

Relentless workplace organization that rewards the user with Safety, Inventory Control, and radically improved Workflow

- | | |
|-------------|---------------------|
| 1. Seiri | Sort |
| 2. Seiton | Set in Order |
| 3. Seiso | Shine |
| 4. Seiketsu | Standardize |
| 5. Shitsuke | Sustain |



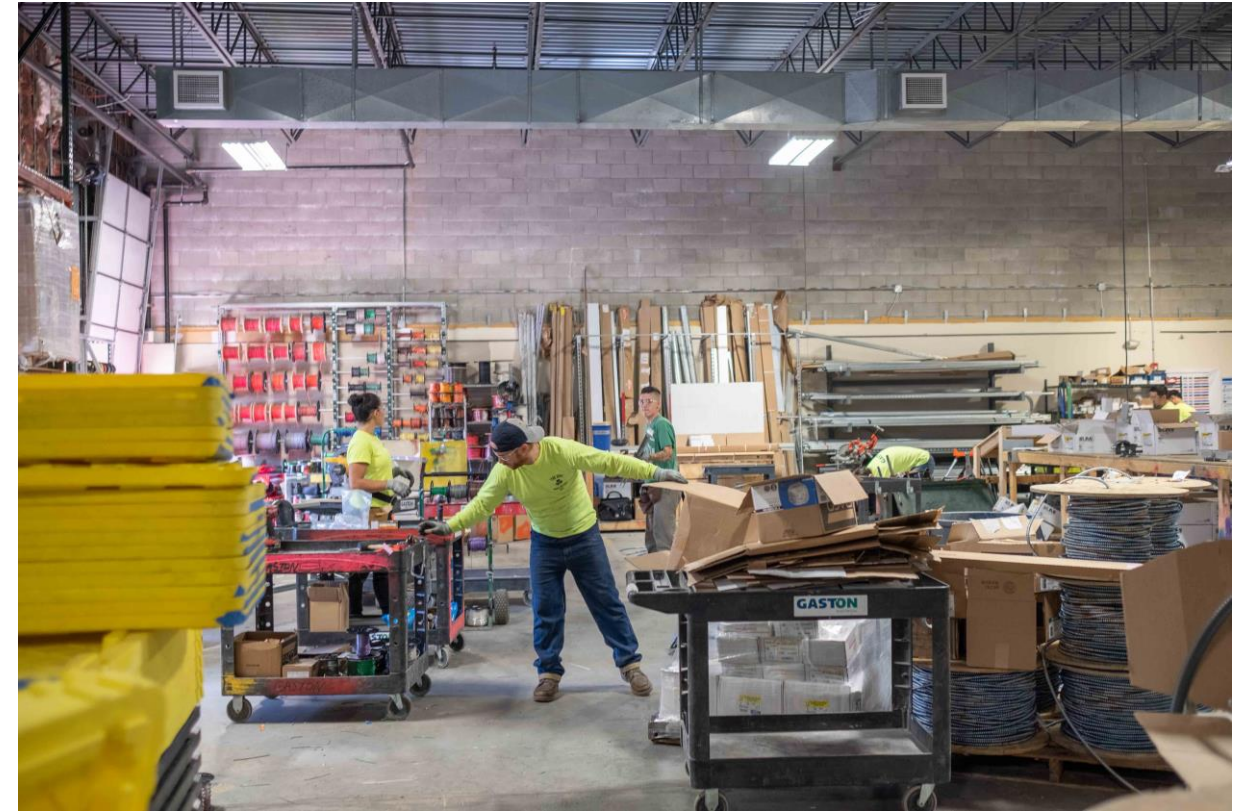
5S: What is it?



Setting in order and sustaining 5S: Shadow Boards



Safety in fab shop



Visual Management

Part of 5S and a Lean Cornerstone



Lean Management

Does the space visualize
what must be controlled?

Visual Management



- ✓ Easy to understand
- ✓ See at a glance

- ✓ Planning
- ✓ Check & control
- ✓ Adjustment

The individual comprehends and change behaviors

Types of Visual Systems



Visual Indicator



Visual Signal



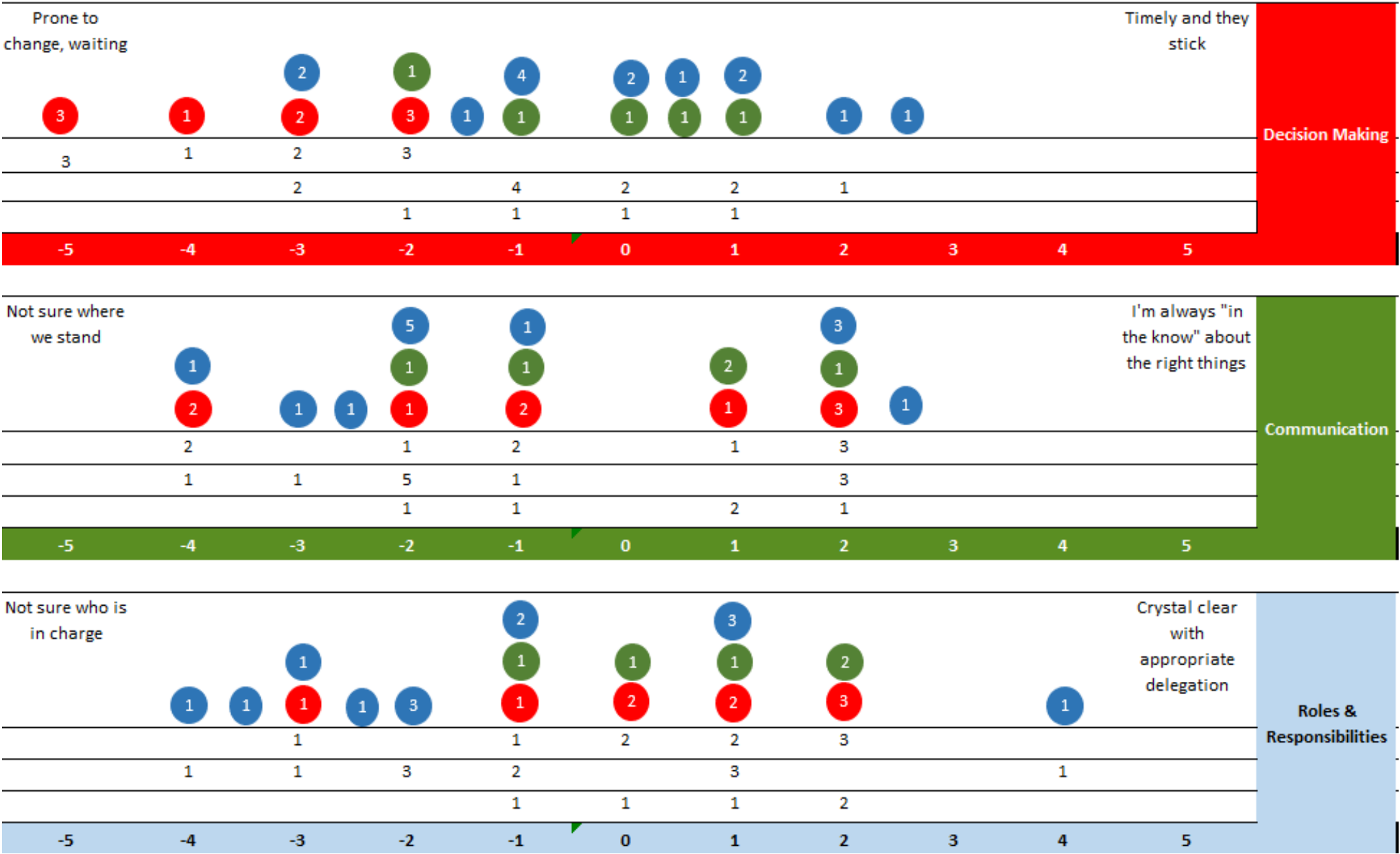
Visual Control



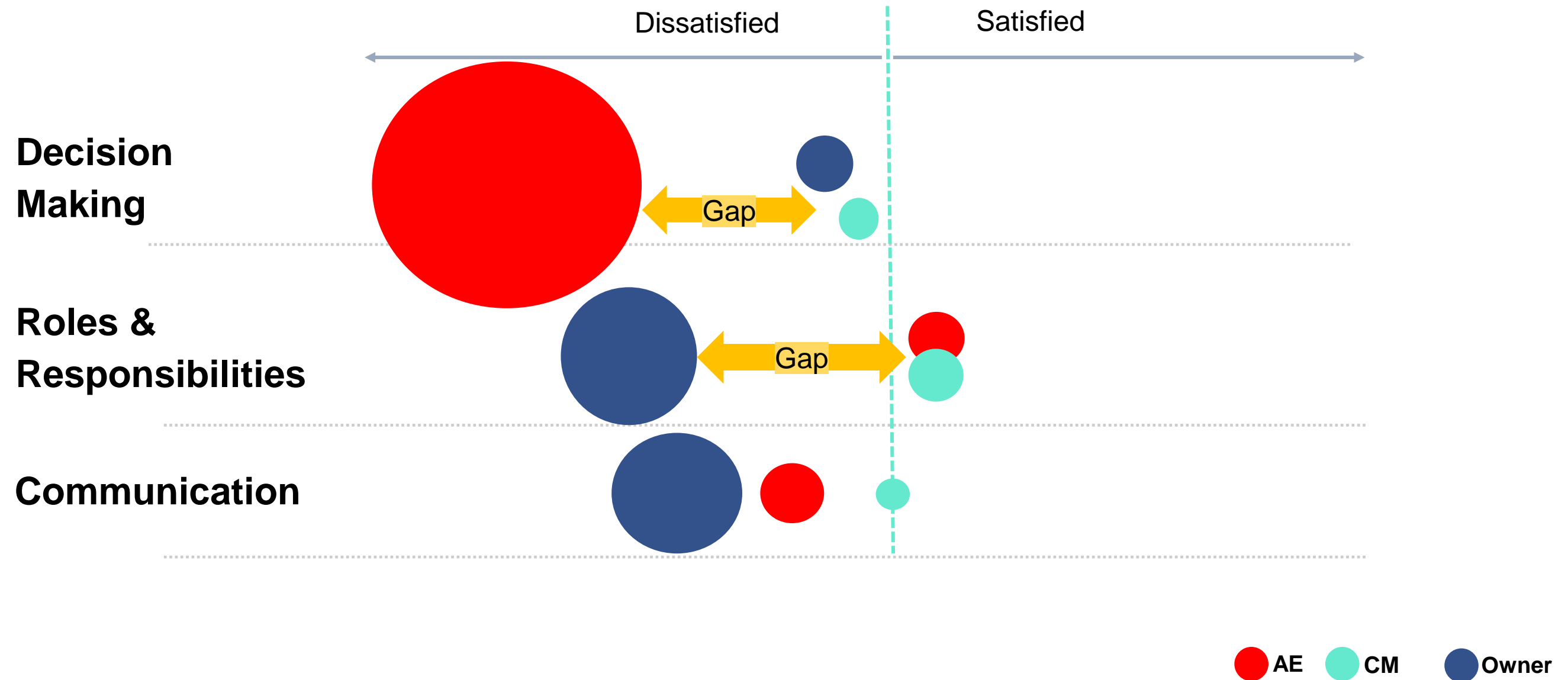
Visual Guarantee



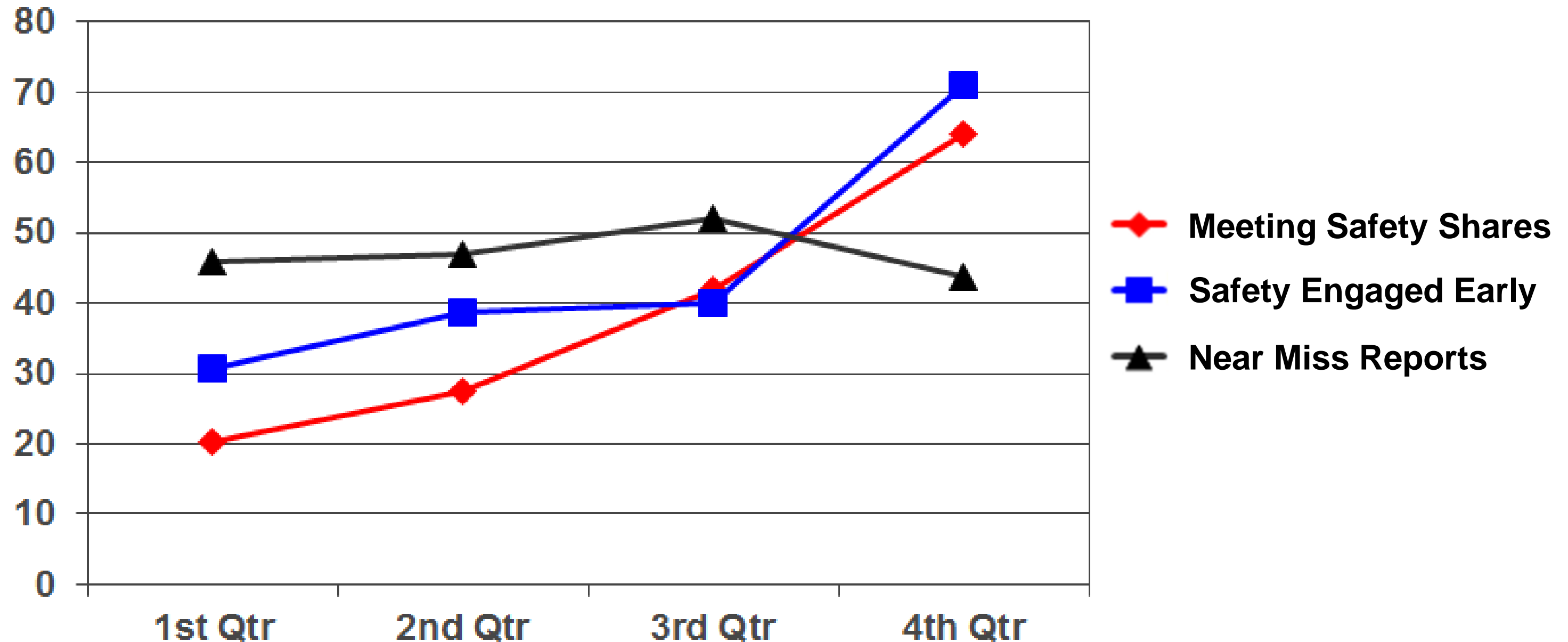
Team Scan: Where are we as a team relative to ideal performance?



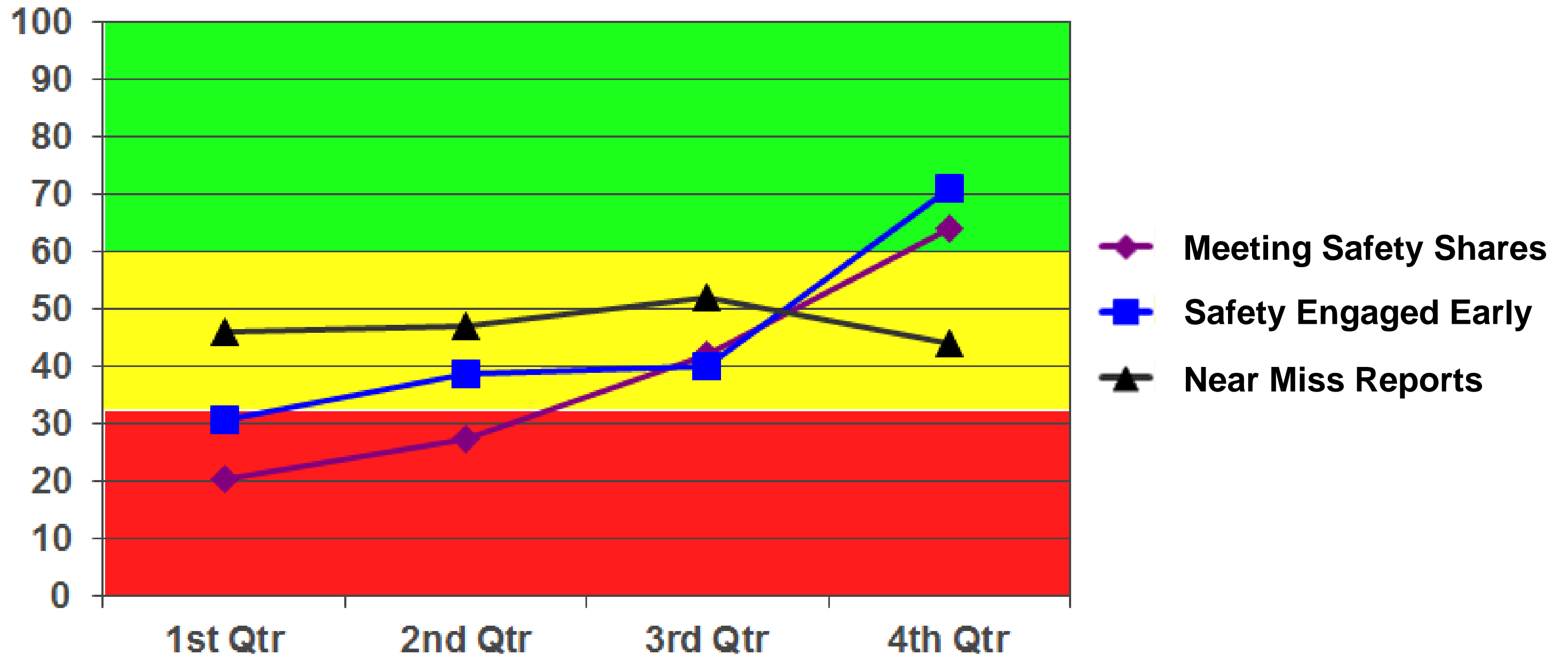
Team Scan: Where are we as a team relative to ideal performance?



Example: How are we doing? Can you tell?



Example: Now how are we doing?



Failure-Mode-Effects-Analysis

Pre-Mortem vs. Post-Mortem



FMEA in the News

- SpaceX has faced scrutiny for decisions like planning for the crew to be onboard while the rocket is fueled. In the past, NASA has considered that too risky.
- The space agency has tentatively approved SpaceX's approach, known as "load and go." "We came to the conclusion that this was an acceptable risk that we were willing to take."



See Risk and Ability to Prioritize

A campus team had a bias to manage to SEVERITY. This led them to activate a \$\$\$\$\$ mitigation strategy, that was not necessary.

TIP:

Be sure to have a diverse group of stakeholders and expertise on hand

FMEA: Failure Mode Effects Analysis									
Identify ways failure can occur, estimate risk of failure, prioritize actions to offset/reduce risks									
Current Condition									
Process Steps	Failure Mode	Failure Effects	Severity	Causes	Likely	Controls or Detection	Difficulty Detecting	Risk Priority Number (RPN)	Actions
What is being done?	How can this go wrong?	How can this go wrong?	1 – 5 (minimal – catastrophic)	What causes the failure?	1 – 5 (not likely – certain)	How do we detect or prevent?	1 – 5 (clear signal – blind)	Severity x Likely x Detection 1-25 26-50 51-125	How could we counter?
DRIVING PILES FOUNDATION	DRINKING WATER NO LONGER POTABLE	CEMENT pH↑ LEACHES INTO AQUIFER	5	ENOUGH HIGH PH MATERIAL INTERACT FOR LONG ENOUGH TIME	1	CONTINUOUS MONITORING • FAST, EFFECTIVE RESPONSE • TOWN WATER PLAN 'B'	1	5	

This tool, and the associated thinking, helped them see the path to managing risk.

Premortem: What and Why



Premortem: a managerial strategy in which a project team imagines that a project or organization has failed, and then works backward to determine what potentially could lead to the failure of the project or organization. [Wikipedia](https://en.wikipedia.org/wiki/Premortem)

- Risks of NOT doing a premortem:
 - Impacts to safety, quality, cost, and timeliness
 - Dissatisfied client
 - Unhappy staff; untapped potential; leave the company

Why teams don't do premortems



- We tend to be **overconfident**
- **Don't have the time** (think we don't)
- We fear we'll **disrupt the harmony** among team members
- Giving and receiving **feedback** is hard (lack trust, being vulnerable is hard)
- We don't have a **beginner's mind**

FMEA vs JHA

		JOB HAZARD ANALYSIS	
		Job/Operation Title:	JHA No.: Date:
Project:	Location(s):	Job Start Date:	Analysis Developed By:
Person(s) Performing This Job:	SSO:	Duration:	Analysis Reviewed By:
Task/Step	Potential Hazards	Consequence	Recommended Safe Job Procedures
			-

Root cause problem solving



A few (Lean) tools for analyzing root causes

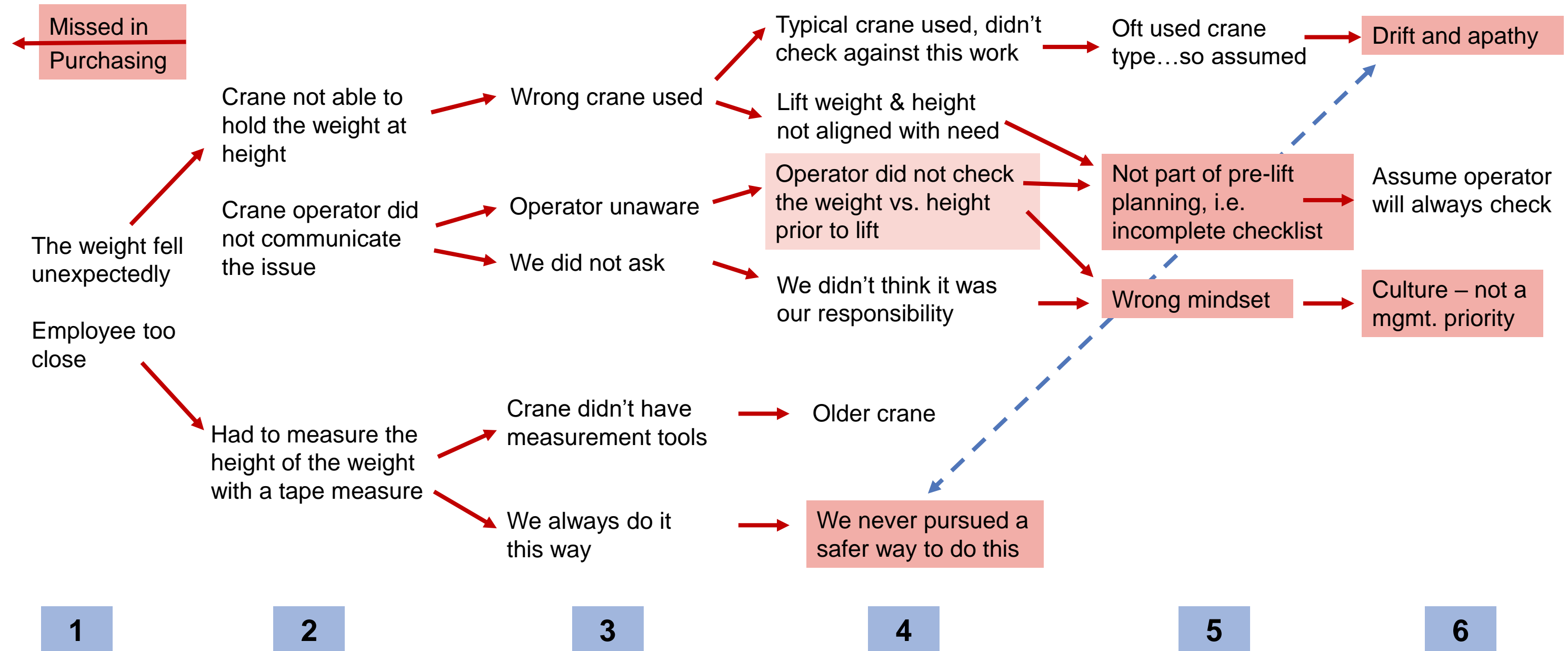
- **5 Why's**: method of inquiry that deepens understanding
- Fishbone (Ishikawa): helps a team identify and **explore groups of causes in increasing detail**
- **Value Stream Mapping**: makes visible the relationship of a set of processes, people, outcomes and problems

Dynamic Compaction in Action



*Photograph used by permission of courtesy of
Hayward Baker, Inc., from
<https://www.haywardbaker.com/solutions/techniques/dynamic-compaction>*

5-Why's: "Why did H&A employee almost get hit by the weight?"



One more idea to share...



Question

- **Who had the most influence on determining how quickly the Titanic could turn away from the Iceberg?**



Personal Reflection and Commitment (5 mins)



**Even if you're on the right track,
you'll still get run over if you just
sit there.**

- Will Rogers



Improvements will be achieved by all of us

Breakout and share (5 mins)



Plus/Delta



Thank You!



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This concludes The American Institute of Architects Continuing Education Systems Course

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