How Continuous Improvement Can Drive Safety

CBIA S&H Conference - May 2016

Pete Susca
Principal / Owner

OpX **SAFETY**
OPERATIONAL EXCELLENCE LLC

Todays Topics

- Discuss your Continuous Improvement (CI) situation and safety integration challenges
- Review CI methods and tools and safety integration opportunities
- Define "waste" in terms of safety
- Provide company-wide integration examples
- Discuss typical integration challenges and recommendations
- Respond to your questions

What's Your Situation?

- CI group?
- CI process?
- CI value/priority?
- Management's safety expectation?
- Safety well integrated into CI?
- Challenges?

Key Principles

- Process improvement and employee involvement are common denominators
- Everyone needs to understand all of the impacts of waste (not just the traditional ones)
- If CI is a "fast moving train" in your organization - get on it and help steer
- Make holistic process improvement – not discrete fixes
- Make the business case – CI without safety isn't really continual business improvement

Why Does This Process Need Improvement?

- Is safety fully integrated into the business decision-making process?
  - Process, equipment, product design
  - Acquisitions, purchases, etc.
  - Changed process, product, etc.
  - New equipment, materials, substances, etc.
  - Contractor selection
  - Supplier selection

- Does a safety professional need to be present for this to work?

What is Continuous Improvement?

Continuous improvement is a methodology for identifying opportunities for streamlining work and reducing waste. Process improvement through stakeholder involvement.

- PDCA / DMAIC

- Six Sigma

- Kaizen

- 5S

- Process / Value Stream Mapping

- Standard Work

- Visual Workplace

- Mistake-proofing

- Causal Analysis

- Etc…

What is a Process?

The interaction between people, environment, equipment, tools, etc., necessary to create an intended outcome.

- Many processes are not really thought about – they are **just the way you go about doing something**
- Why do you do it – or do it that way?
    - to achieve a desired outcome, that's the way you've always done it, etc.
- Your concern about the outcome drives the amount of effort that you put into the process

Process "health" measures are the best predictive metrics
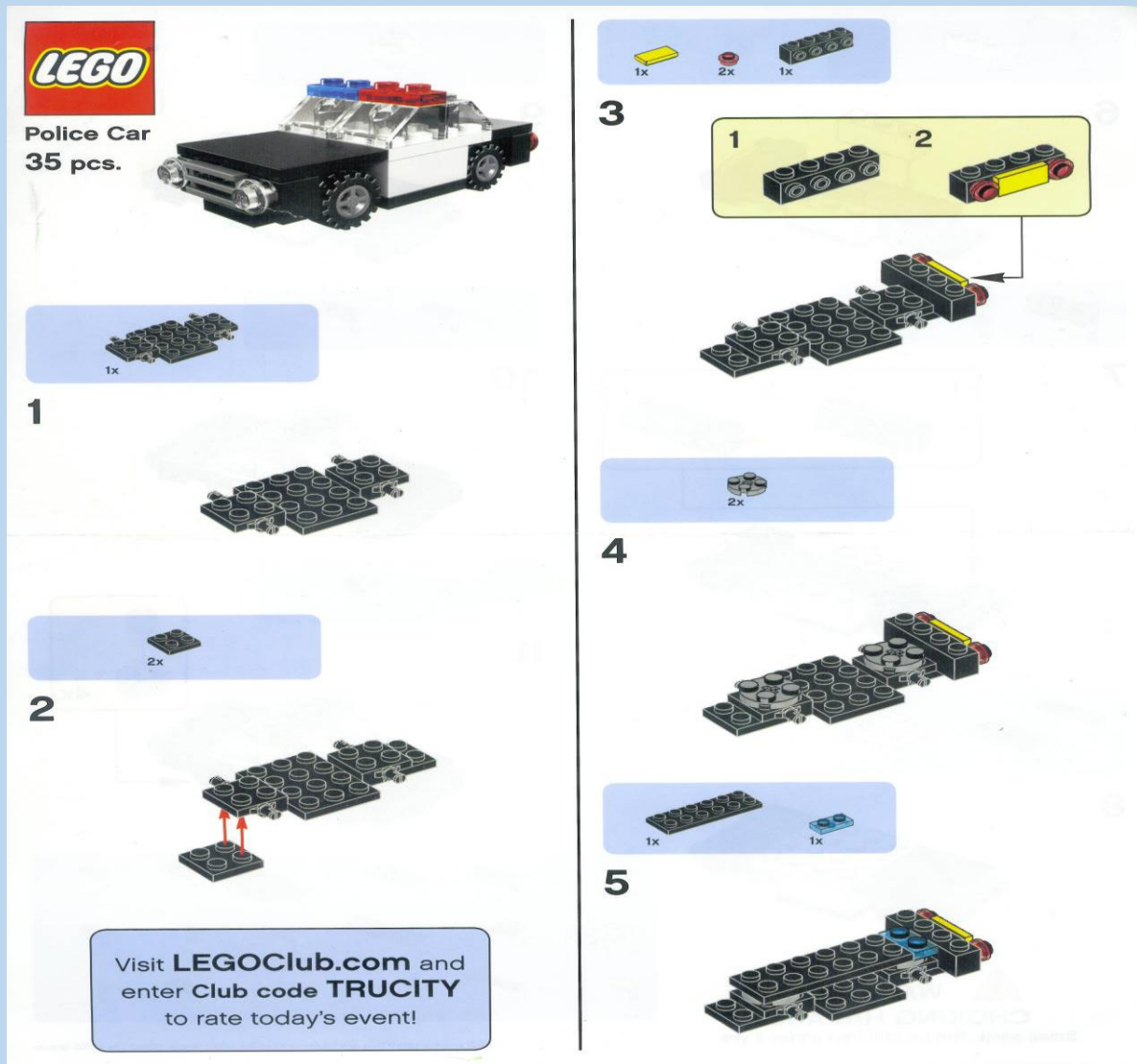
SAFETY
OPERATIONAL EXCELLENCE LLC

Attributes of Robust Processes

- Clear expectation
- Clear ownership and "customer"
- Approach fits the expectation
- Buy-in to the approach
- Good fit in the culture
- Repeatable
- Measureable
- Reliable - High percentage of outcomes within the standard
- Durable - withstands change well
- Auditable – along the way
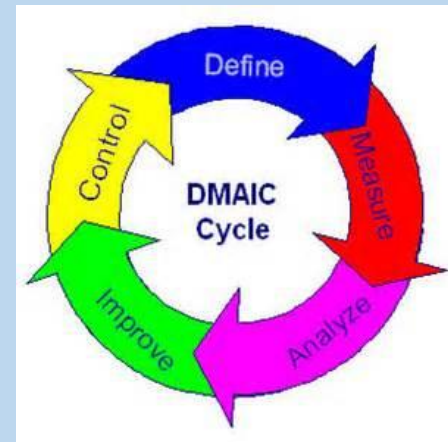
These are the attributes that you will use to judge every process

Lego "Standard Work" Example

- ❑ Clear expectation
- ❑ Clear ownership and "customer"
- ❑ Approach fits the expectation
- ❑ Buy-in to the approach
- ❑ Good fit in the culture
- ❑ Repeatable
- ❑ Measureable
- ❑ Reliable - High percentage of outcomes within the standard
- ❑ Durable - withstands change well
- ❑ Auditable – along the way

Process / Value Stream Mapping (VSM)

- You must map the *actual* steps taken to accomplish the work.

- This will visibly display the hidden waste.

- Safety "waste"?
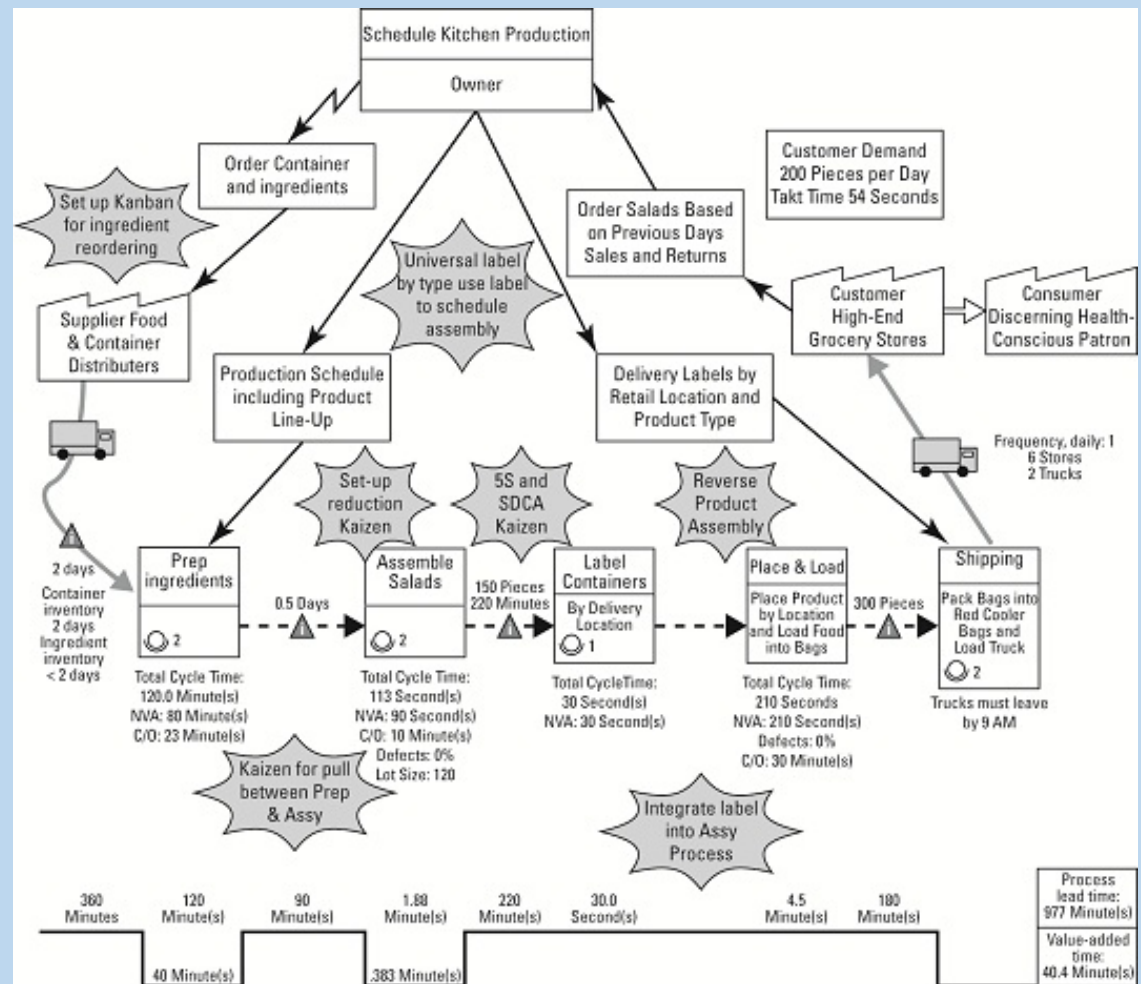
What is the CI Principle Here?
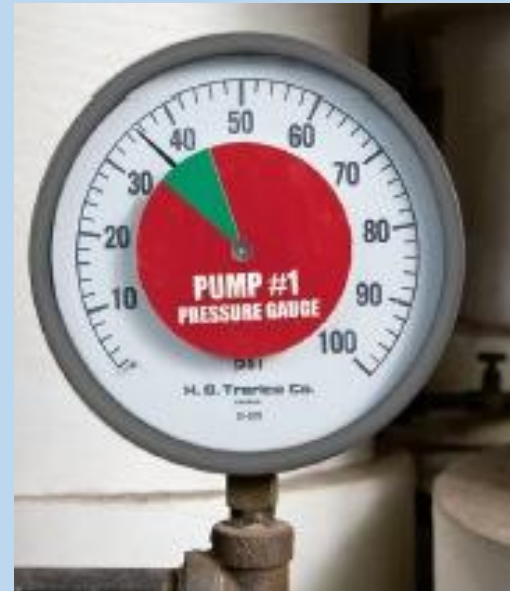
How Does This Apply to Safety?

SAFETY
OPERATIONAL EXCELLENCE LLC

Recommendation #1

- Learn and embrace the core the CI principles

- Work with the other Functional Groups to build robust processes that meet all of your organization's values/expectations
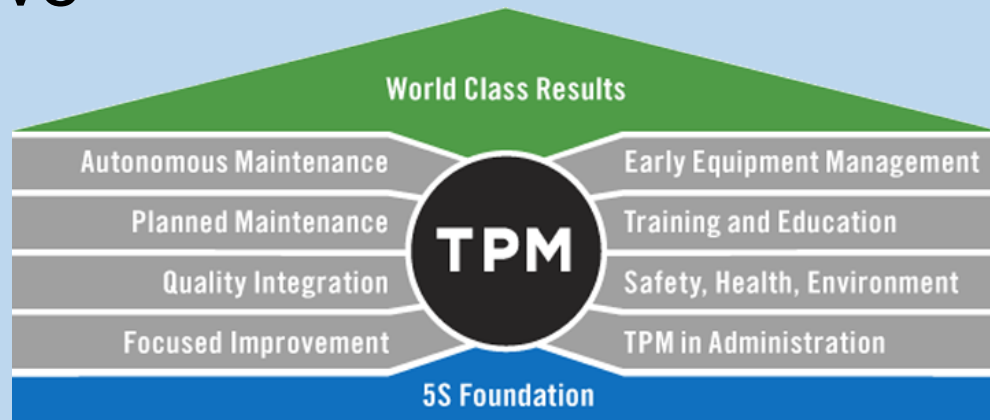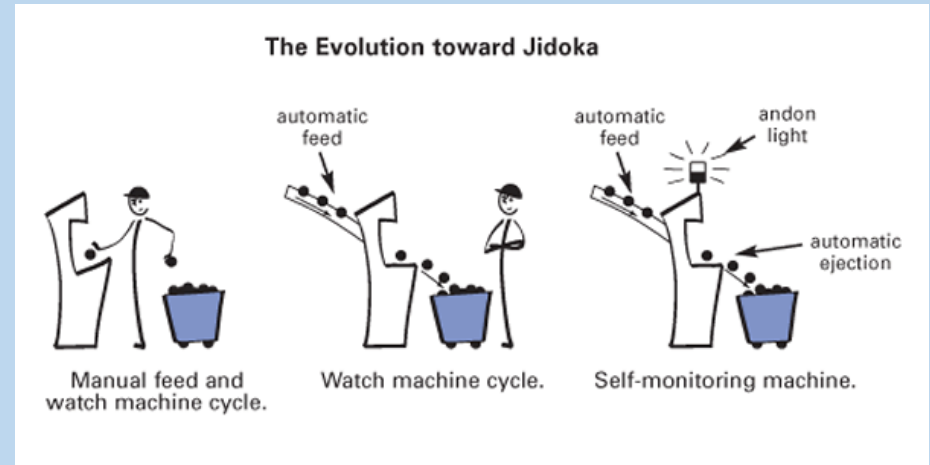
Lean Manufacturing

- "Lean" (aka, World Class Manufacturing (WCM), Continuous Flow Manufacturing, etc.) is a practice that focuses on the elimination of wasteful elements in all processes to increase the value to the customer.

- With Lean, the goal is to eliminate anything <u>not essential</u> to the process.

  1. Define Value as Perceived by the Customer
  2. Identify the Value Stream
  3. Make the Value Stream Flow
  4. Flow at the Pull of the Customer
  5. Strive for Perfection

- When "Lean" becomes solely based on cost reduction, imbalances can occur

ANSI B11.TR7-2007 Designing for Safety and Lean Manufacturing

SAFETY

OPERATIONAL EXCELLENCE LLC

Lean Tools

- 5S
- Jidoka
- Kaizen
- Process Mapping
- Just In Time (JIT)
- Total Productive Maintenance (TPM)

The Evolution toward Jidoka

Manual feed and watch machine cycle. — Watch machine cycle. — Self-monitoring machine.

World Class Results

Autonomous Maintenance	Early Equipment Management
Planned Maintenance	Training and Education
Quality Integration	Safety, Health, Environment
Focused Improvement	TPM in Administration

5S Foundation

5 S

1. **Sort** – remove unneeded materials from the workplace, eliminate distractions and confusion;

2. **Set-in-order (straighten)** - make it easy to visually find things that are needed including parts, tools, information, etc.;

3. **Shine** – introduce a regular system for cleaning the work area, also focusing on inspecting the workplace for equipment needing preventive maintenance;

4. **Standardize** – establish methods to maintain cleanliness; and

5. **Sustain (self-discipline)** – implement methods to sustain the process, including continuous improvements.


OPERATIONAL EXCELLENCE LLC

15

"Waste" Understanding

Waste = Excessive Risk = Unwanted Outcomes

Educate yourself on the business
- What are the main drivers of "success"?
  - Where do we make the most profit, why?
  - Material vs. labor cost?
  - What "steals" from profit?
  - Making a business case for safety improvement

- How good are your safety staff at spotting "waste"?
  - Materials, time, non-value-added work (exposures), poor work flow, short-cutting, free-lancing, etc.
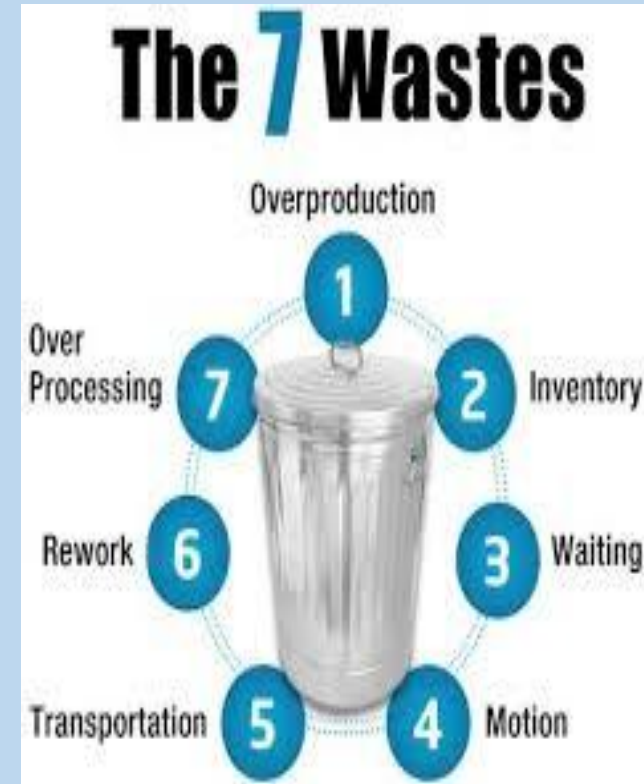
Unnecessary Hazards, Ineffective Controls & Disengaged Employees

Heightening Your Waste Senses

- Actions of people and operational conditions

- Condition and accessibility of tools and equipment

- Loud noises, odors, etc.

- Planned vs. reactive work/actions

- Material flow & excess materials

- Short-cutting – housekeeping, order of process steps, over exposure, etc.

- Watch people at work

- Ask, "Why do you do it that way?"
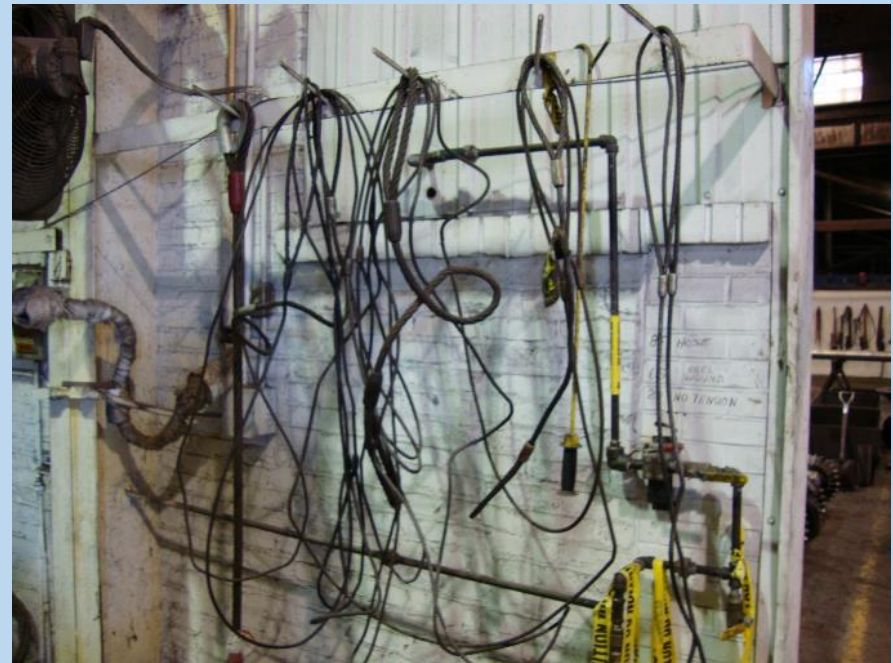
Removing Slag From A Skimmer
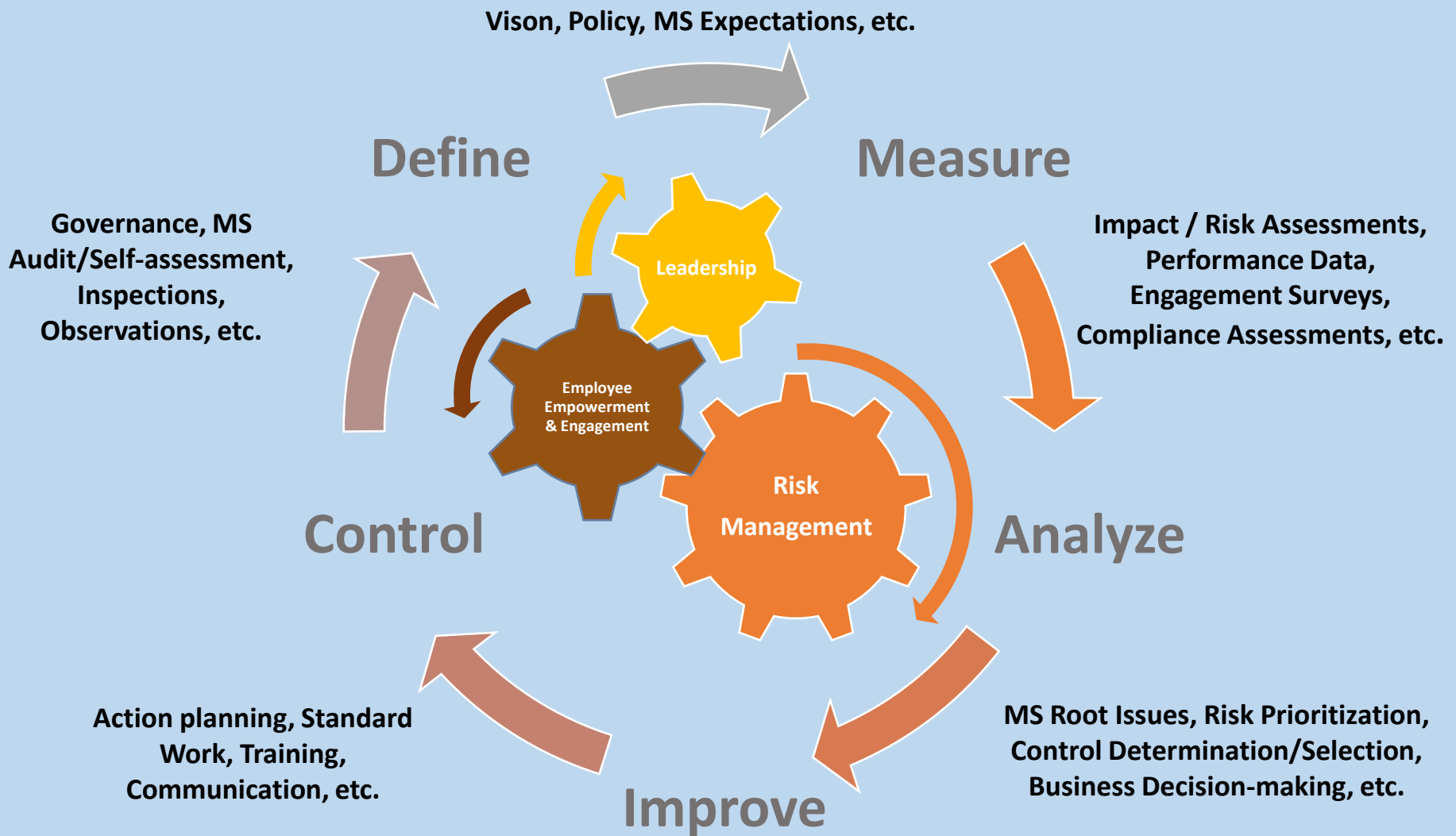
01/15/2013

01/17/2013

SAFETY

OpX

OPERATIONAL EXCELLENCE LLC

Recommendation #2

- Develop a common waste and waste impact understanding throughout your organization

- Safety-related waste must be included in the CI expectations, processes, training, checks, measures and accountability.

The SMS "Continuous Improvement Engine"

Vison, Policy, MS Expectations, etc.

Define

Measure

Governance, MS Audit/Self-assessment, Inspections, Observations, etc.

Impact / Risk Assessments, Performance Data, Engagement Surveys, Compliance Assessments, etc.

Leadership

Employee Empowerment & Engagement

Risk Management

Control

Analyze

Action planning, Standard Work, Training, Communication, etc.

MS Root Issues, Risk Prioritization, Control Determination/Selection, Business Decision-making, etc.

Improve

OpX SAFETY
OPERATIONAL EXCELLENCE LLC

Safety and CI Integration Success Story: UTC

United Technologies Corporation – $56B Revenue

Pratt & Whitney, UTC Climate Controls & Security, Otis & UTAS

- CI initiatives started at Business Units in the 1980's
  - Many where counter productive to EH&S
- Developed an EH&S Management System in 1989
- P&W formed the initial Achieving Completive Excellence (ACE) process in 1996 and became a UTC-wide process soon after
- ACE Achievement Levels: Qualifying, Bronze, Silver & Gold
- UTC Corporate EH&S inserted criteria into each qualification level
- ACE was a "Fast moving train"!
- ACE drove EH&S improvement much faster that the EH&S alone

EH&S "Baked into" ACE

Process Management

- Simple web enabled EHS processes
- Measurable and trackable metrics and data for departments available on-line.

Standard Work

- Standard EHS checklist for all levels of laboratory and test stand self audits
- Standard EHS guidelines for various tasks and programs.
- Web enabled, easy accessible information which is smartly cataloged.
- Identify 10 Waste Elimination Opportunities for Departments (not currently done)

Market Feedback Analysis

- *Identify Customers and Process for Capturing Problems (Escapes, etc.)*

Passport System

- EH&S review is fully integrated into the Facility work request process.
- Capital appropriations must identify EHS impact
- EHS is a component of all PICP reviews.
- EHS review of all contractors performing work on site.

General

- ACE Overview Training
- EH&S Overview Training
- ACE Pilots in Place
- General Quality System in Place

New 5S

- Awareness Training - web enabled EHS training courses.
- Owners for Shared Areas/equipment Identified - EHS lab sign program and database.
- Info on EH&S Hazards and Prevention and Control Methods Displayed on lab signs.
- EHS laboratory Checklists Developed and Used.
- EHS records retention policy, annual implementation for internal EHS records and line self inspections.

Total Productive Maint.

- Equipment Assessment
- Standard EHS checklist for all levels of laboratory and test stand self audits identify poor equipment condition.
- A lack of TPM can lead to EHS turnbacks (spills, releases, violations, etc.)
- Save energy and water - tool to achieve 10X goals
- Reduces wastes associated with poorly maintained equipment plus indirect costs (fluids, manpower, drums, etc.)

Quality Clinic Process Charts

- Processes Identified & Prioritized
- QCPC Data Collection Process plan for top project
- Performance metrics compiles and reported quarterly to senior management and UTC.

Root Cause Analysis

- Awareness Training
- Basic Root Cause Analysis Training for 25% of Workforce
- Incident Investigation process , web enabled preliminary investigation form.
- EHS involvement in RRCA for all EHS turnbacks

Mistake Proofing

- Implement mistake proofing devices for laboratories.
- Develop procedures and standards that set baseline requirements for mistake proofing devices.

Quality Clinic Activity

- EHS provides in-house Capabilities to Identify Root Cause
- Incorporation of Lessons Learned into incident investigation process. Investigations are communicated electronically and posted on the web for reference.
- Top Management Involvement in Program Reviews - Quarterly Oversight meeting which review metrics, lessons learned and root cause of incidents.

UTC ACE Qualifying Level EH&S Criteria

- EH&S and ACE Overview Training
- 5S – Hazards and risks displayed in the work cell
  - Qualitative IH exposure assessment complete
  - UTC SP008 – Machine risk assessment complete
  - Regulatory compliance assessments complete
  - Aspects, Impacts and Risk Assessments complete
- TPM
  - LOTO energy sources identified
  - Machine maintenance manuals include LTO procedures
  - UTC SP 008 hazard-based training for high hazard machines
  - LOTO training and equipment in place
  - Set-up Reduction – standard work and training on EH&S risks and controls

Recommendation #3

- Integrate safety assessments and controls into the master elements of the CI process

- Make the majority easy for a non-safety pro to implement – visual indicators, right/wrong, etc.
  - Make it black & white – no grey
  - Clearly define the expectation
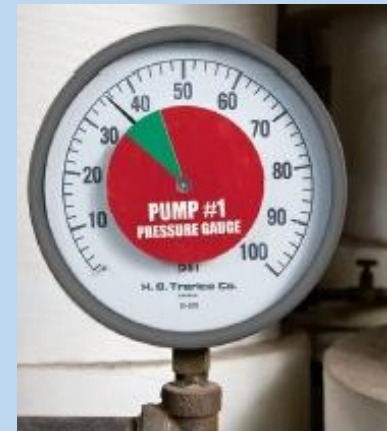
Typical CI/Safety Integration Challenges and Recommendations

- Getting on the train – influence, respect, business & CI knowledge
  - Practitioner integration
- Silo protection and threats
- Safety slows the process – only if done wrong
- Make it simple – 80/20 Rule: basic guidance that doesn't require an safety pro
- Cost reduction focus
- Union and employee buy-in
- Make a business case
  - Why process improvement should include safety

SAFETY

OPERATIONAL EXCELLENCE LLC

In Summary

- Enhance your business and CI knowledge

- Become "waste" experts

- Use benchmark data (other company success) and local data to make a business case for safety integration

- If you can't get traction – find an ally

- Use the CI techniques to improve your safety processes

SAFETY

OPERATIONAL EXCELLENCE LLC

Additional Questions?

Thank you!

Peter T. Susca, Principal
Operational Excellence LLC (OpX Safety)
Email: opxsafety@cox.net
Phone: 860-713-8050
Website: Opxsafety.com

Find Us On: