LISTEN. THINK. SOLVE.®

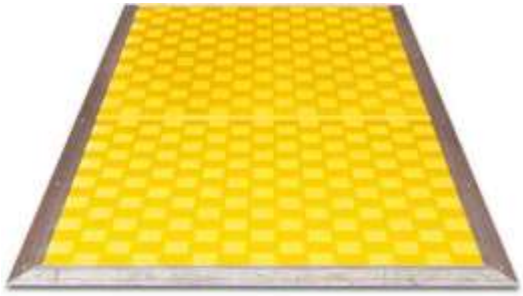
Engaging Employees

Lessons from Machine Safety

PUBLIC INFORMATION

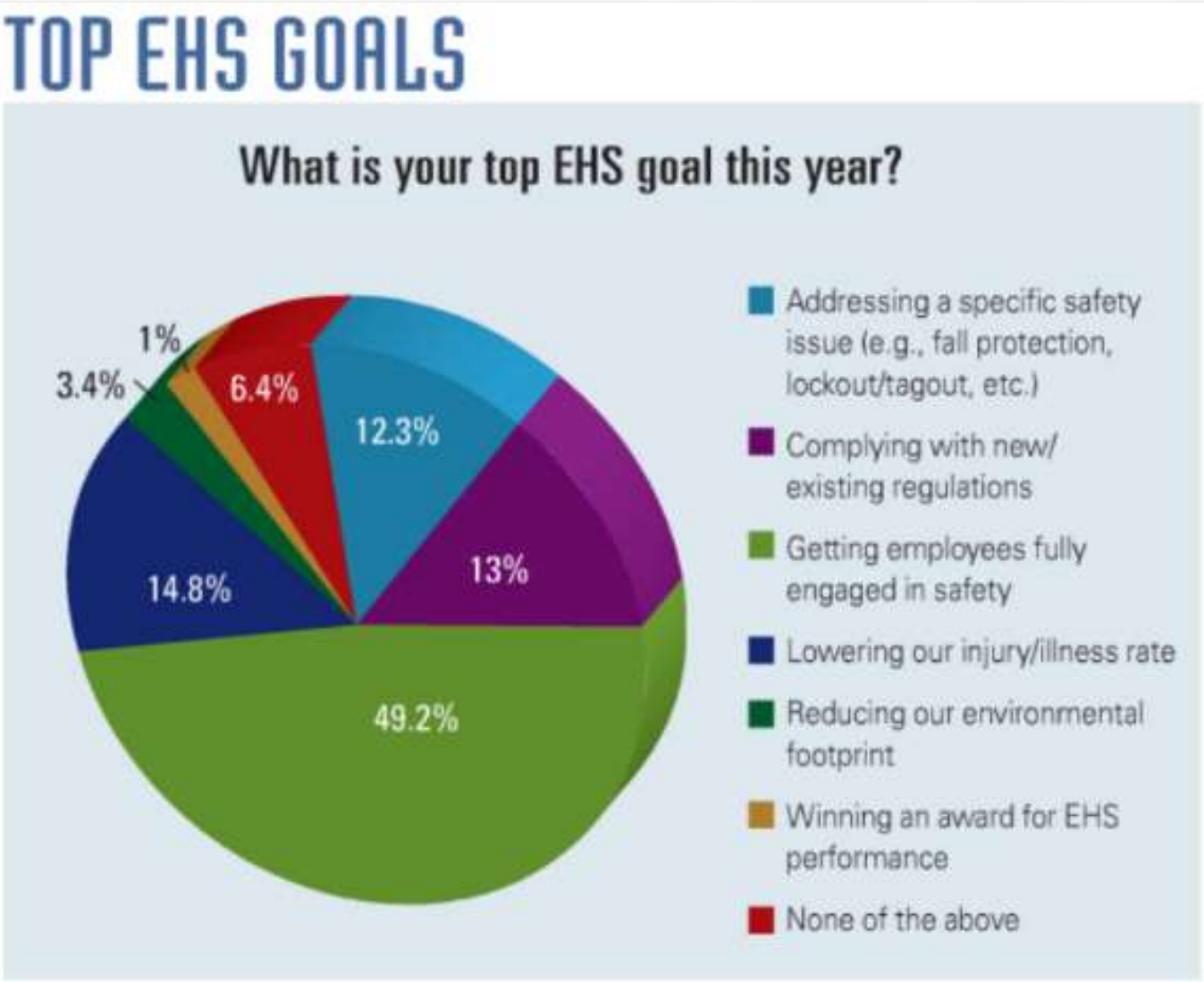
Allen-Bradley • Rockwell Software

Rockwell Automation



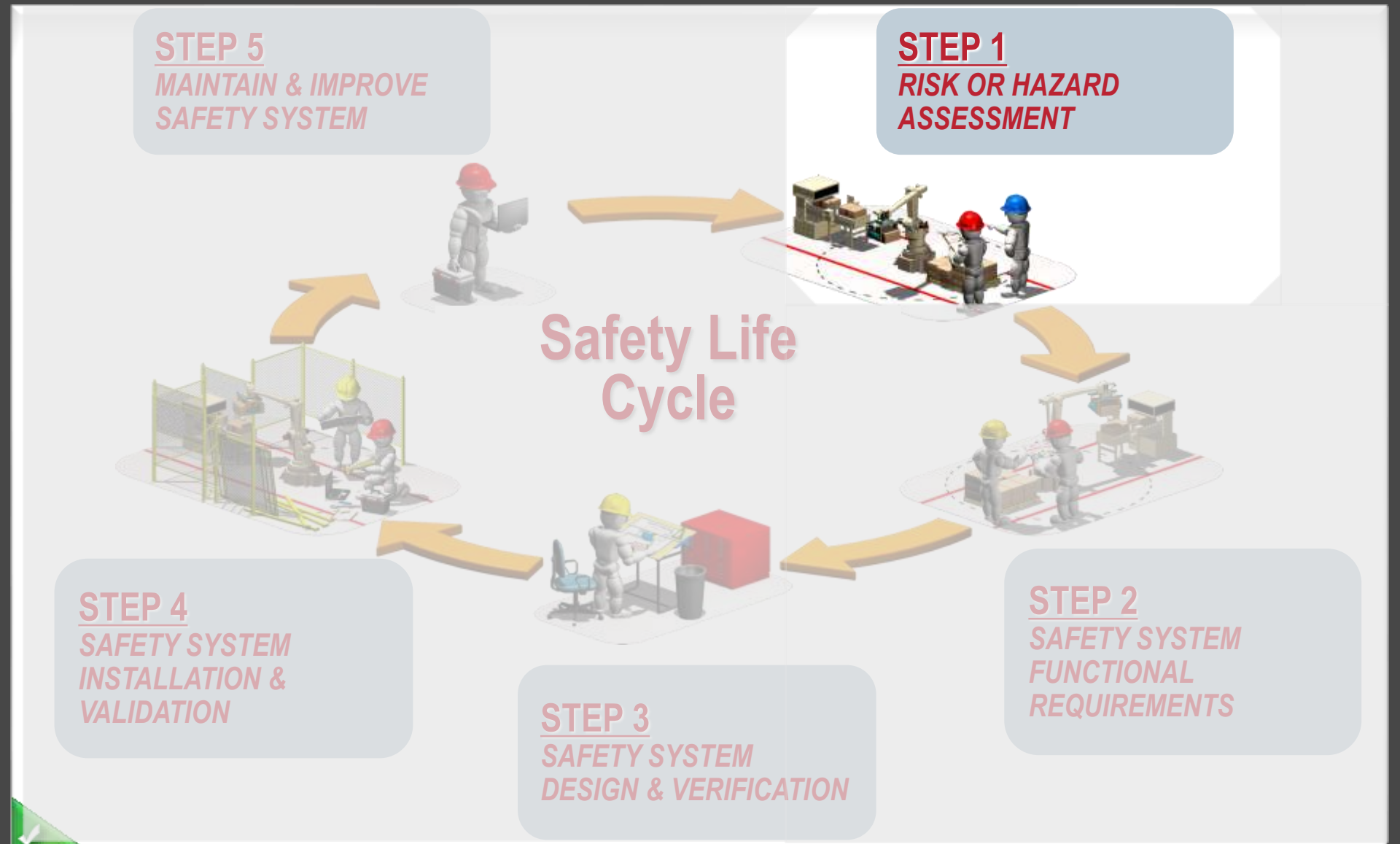
When you hear “machine safety”…

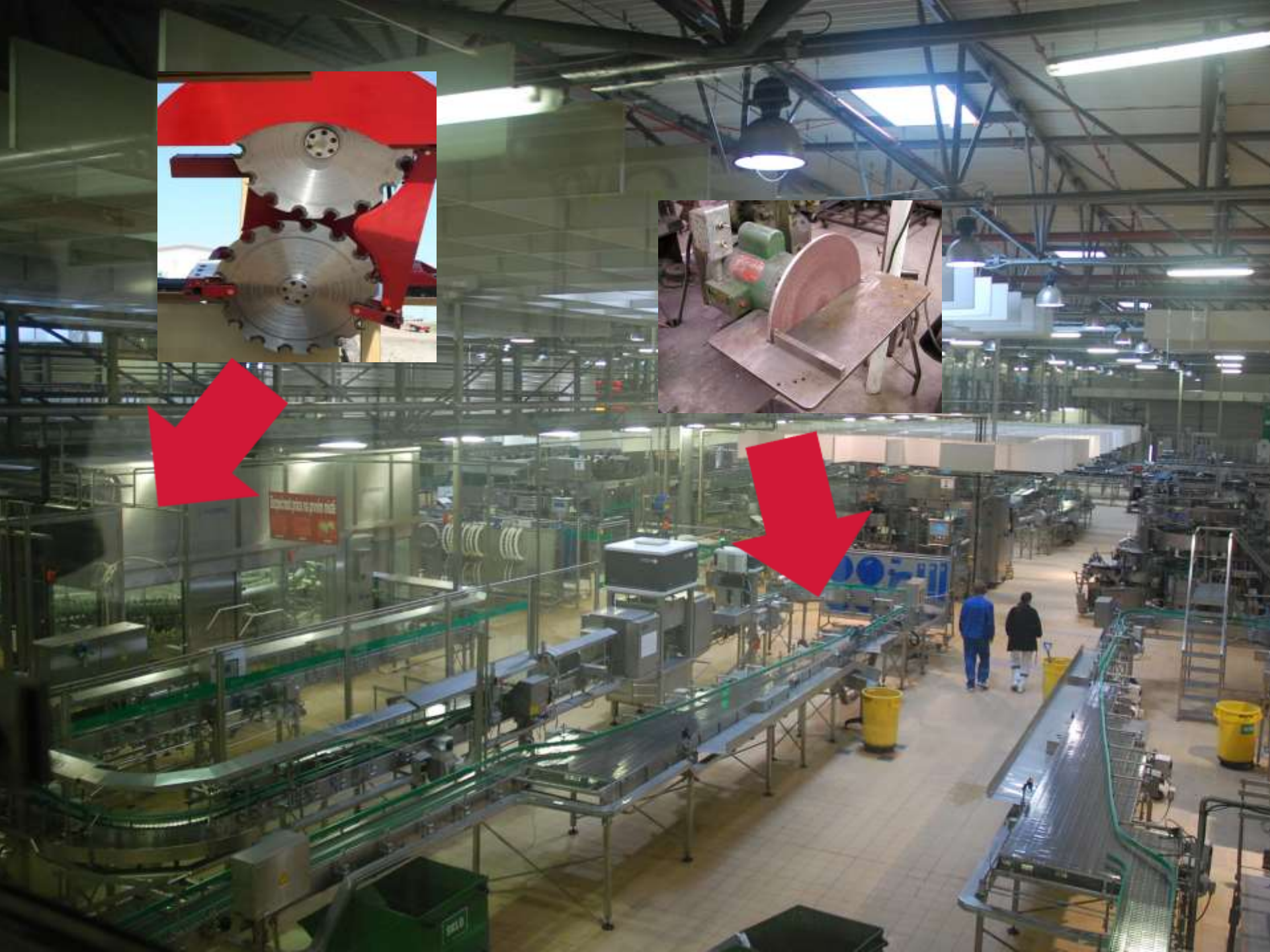
Machine Safety – Why Focus on Engagement?



National Safety Survey
- EHS Today

Machine Safety – Why Focus on Engagement?





Machine Safety – Why Focus on Engagement?

Hierarchy of Protective Measures

Inherently safe design and construction	Design it out	
Protective Systems and Measures	Fixed enclosing guard	
	Monitoring Access / Interlocked Gates	
Administrative Controls and PPE	Awareness Means, Training and Procedures (Administrative)	
	Personal protective equipment	

Most Preferred

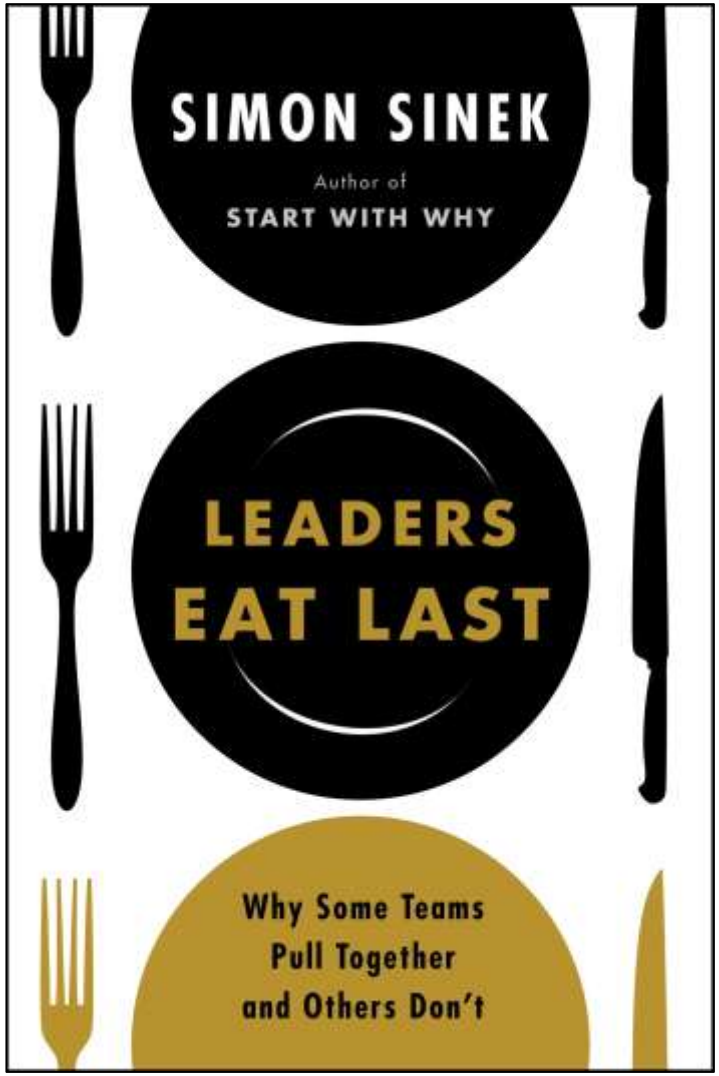
Least Preferred

Machine Safety – Why Focus on Engagement?

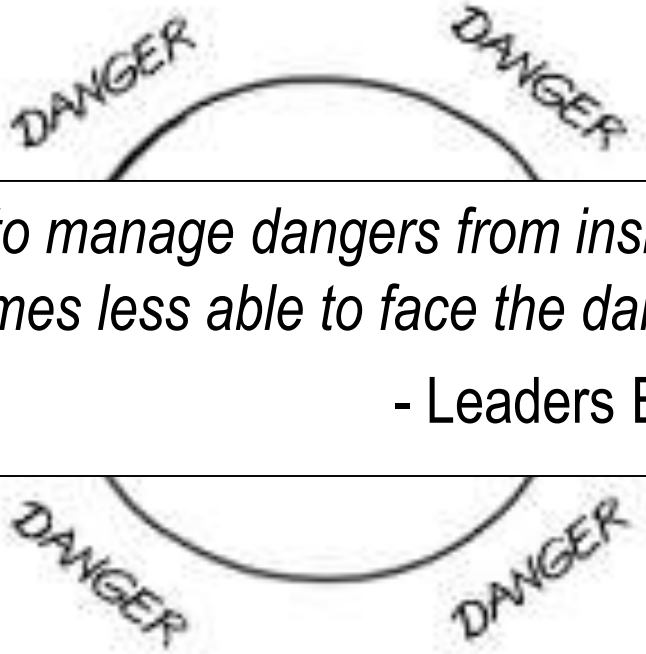
Machine Safety – Why Focus on Engagement?

Preparing to Engage

Are *YOU* ready to engage?



Are *YOU* ready to engage?



When the people have to manage dangers from inside the organization, the organization itself becomes less able to face the dangers from outside

- Leaders Eat Last by Simon Sinek

Are *YOU* ready to engage?

Is your *ORGANIZATION* ready to engage?

Is safety on par with

EHS

print | close

The National Safety Survey: The War Between Safety and Production Continues

EHS Today

Sandy Smith

Thu, 2013-08-08 09:05

Nearly 1,000 EHS professionals responded to the 2013 National Safety Survey. Most said that safety has improved at their organization in the past year, but many admitted the safety versus production argument is ongoing and some shared truly horrifying stories of workplace violence and bullying.

National Safety Survey

- EHS Today

Is your *ORGANIZATION* ready to engage?

Turn to Aberdeen for Research with Results™

Aberdeen Group
A Harte-Hanks Company

Defining Best-In-Class Performance

Definition of Maturity Class	Mean Class Performance
Best-in-Class: **Top 20%** of aggregate performance scorers	• 90% OEE • 0.2% Repeat Accident Rate • 0.05 Injury Frequency Rate • 2% Unscheduled Asset Downtime
Industry Average: **Middle 50%** of aggregate performance scorers	• 85% OEE • 2.4% Repeat Accident Rate • 0.9 Injury Frequency Rate • 6% Unscheduled Asset Downtime
Laggard: **Bottom 30%** of aggregate performance scorers	• 76% OEE • 10% Repeat Accident Rate • 3.0 Injury Frequency Rate • 14% Unscheduled Asset Downtime

Source: Aberdeen Group, September 2010

- 5%-7% Higher OEE
- 2%-4% Less Downtime
- <50% injury rate

“The 3C’s”

Safety Maturity Index™
for Machinery

Rockwell Automation

Allen-Bradley · Rockwell Software

LEVEL	FOCUS	CULTURE BEHAVIORAL	COMPLIANCE PROCEDURAL	CAPITAL TECHNICAL
SMI 4	Operational Excellence	Safety is a **value** – essential to the health of the business.	Standard processes established to design **safety and productivity** into machinery **throughout the supply chain.**	Use of **contemporary** safety technologies & techniques to optimize **safety and productivity.**
SMI 3	Cost Avoidance	Safety is a **priority** – important to the health of the business.	Standard processes established to design **safe machinery throughout the company.**	Use of safety technologies & techniques to **optimize safety.**
SMI 2	Attaining Compliance	Safety is a **necessity** – to meet compliance requirements.	Standard processes established to **meet minimum requirements.**	Use of **basic safety technologies & techniques.**
SMI 1	Minimizing Investment	Safety is **minimized** – it could interfere with other prerogatives.	Minimal processes established to avoid fines and complaints.	Incomplete or improper use of safety technologies.

How safety mature is manufacturing today?

- **SMI 4**: 15% of all respondents
  - Implemented 90% or above of all capabilities
- **SMI 3**: 23% of all respondents
  - Between 75% and 90% of all capabilities
- **SMI 2**: 37% of all respondents
  - Between 50% and 75% of all capabilities
- **SMI 1**: 25% of all respondents
  - Less than 50% of all capabilities

Source – Rockwell Automation, 2013 Manufacturing Safety Effectiveness Study by The Aberdeen Group

Safety Maturity Index™ for Machinery

Rockwell Automation

Allen-Bradley · Rockwell Software

LEVEL	FOCUS	CULTU… / BEHAVIO…	CAPITAL / TECHNICAL
SMI 4	Operational Excellence	Safety is a **value** – the health of the b…	…ntemporary safety …gies & techniques …ze **safety and** …vity.
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SMI 1	Minimizing Investment	Safety is minimize… interfere with othe…	…e or improper use …echnologies.

"Mr. Barnes is here again to speak about machine safety. Unfortunately, I missed his first speech."

Safety Maturity Index™
for Machinery

Rockwell Automation

Allen-Bradley · Rockwell Software

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OPTIMIZE

APPLY

EDUCATE

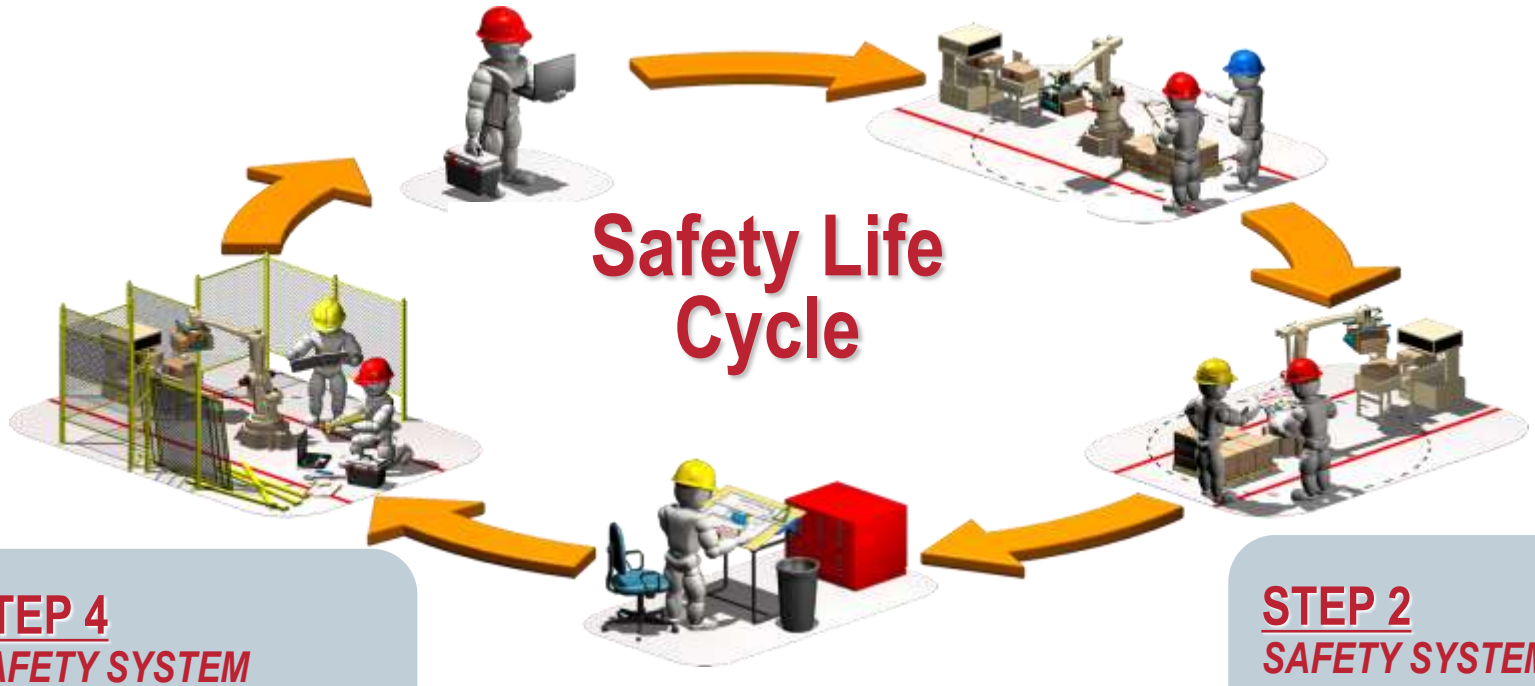
MONITOR

Engagement through the Safety Lifecycle

Machine Safety Lifecycle

STEP 5
MAINTAIN & IMPROVE SAFETY SYSTEM

STEP 1
RISK OR HAZARD ASSESSMENT

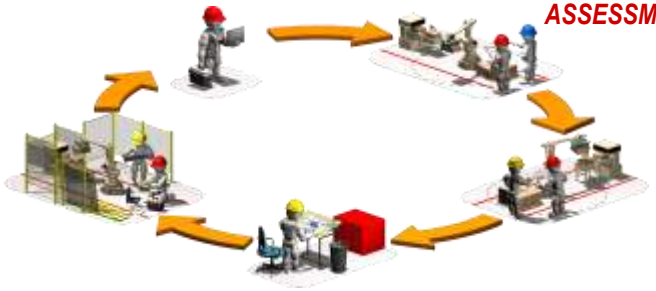


STEP 4
SAFETY SYSTEM INSTALLATION & VALIDATION

STEP 2
SAFETY SYSTEM FUNCTIONAL REQUIREMENTS

STEP 3
SAFETY SYSTEM DESIGN & VERIFICATION

Safety Professional's Role: *Risk Assessment*



- Facilitator and active participant
- Provides guidance regarding risk assessment models and standards
- Risk Assessment document owner
  - Records a comprehensive list of tasks identified by the team
  - Records hazards associated with tasks
- Champion for designing out hazards and identifying passive safeguards

A guarded answer = an unguarded machine

Scalable assessment tools… help prioritize safety system requirements

Conformity Audits	Hazard / Guarding Assessment	Safety Assessment / Audit	Team-Based Risk Assessment
Modular Assessments	**Identifies Primary Hazards**	**Assessment & Estimate**	**Detailed Risk Assessment**
Provides a scalable solution to help save $	*Identifies guarding/ hazards for immediate plant actions*	***Most common** – provides report & estimates to develop safety plans*	*In-depth analysis required for critical or special machines*
For Multiple machines • Provides customers with a method of categorizing & prioritizing machines • Conformity audits that analyse guarding, LOTO, e-stops and circuit analysis and provides a list of complying & non-complying machines to be assessed.	• One Page Report identifying hazards and "Risk-in" rating only • Does not include: ○ Risk Out rating ○ Cost estimation ○ Pictures	• Assessment led by RA Consultant, limited customer involvement • Report per standard ✓ Identification of primary hazards/tasks ✓ List non-compliance issues ✓ Risk In / Risk Out Rating ✓ Mitigation Guarding and Controls recommendations ✓ Prioritized recommendations for safety improvements ✓ Photograph of critical identified hazards (based on customer approval) ✓ Cost estimate per machine	• Team-based assessment led by RA Consultant for all machine life phases • Report per standards ✓ Identification of primary hazards/tasks ✓ List non-compliance issues ✓ Risk In / Risk Out Rating ✓ Mitigation Guarding and Controls recommendations ✓ Prioritized recommendations for safety improvements ✓ Photograph of critical identified hazards (based on customer approval) ✓ Cost estimate per machine • Mitigation Drawing • Includes ergonomics review (slip, trip, and fall hazards)

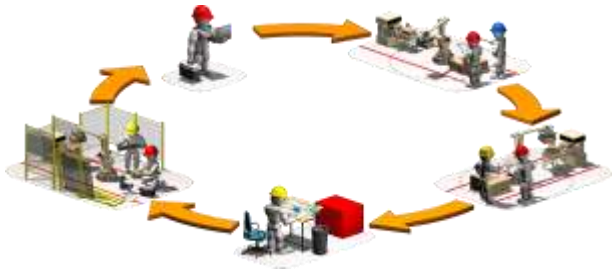
Safety Professional's Role: *Functional Specification*

STEP 2
SAFETY SYSTEM FUNCTIONAL REQUIREMENTS

- Maintains team's commitment
  - Keeps operators and maintenance involved
- Alignment of concept with assessment results
- Focuses effort on designing hazard out
- Is proposed solution *safe & productive*
- Challenges team to ensure that solution is really the best safeguard?

Will this team's solution satisfy concept?

Safety Professional's Role:
Design & Verification

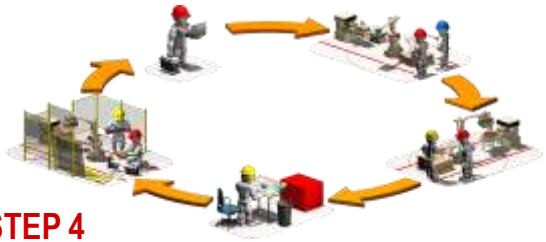


STEP 3
SAFETY SYSTEM DESIGN & VERIFICATION

- Provides oversight to ensure:
  - Design meets concept requirements
  - Verification performed by design engineers
  - Functional spec documentation
  - Compliance with relevant standards
- Have we actually made the problem go away?
  - For design fixes?
  - For guards, physical mock-ups?
  - For controls, mounting locations, actions required, operator panels
- Verification – will this actually work?

Sanity check…. If / then and can we try it?

Safety Professional's Role: *Validation*

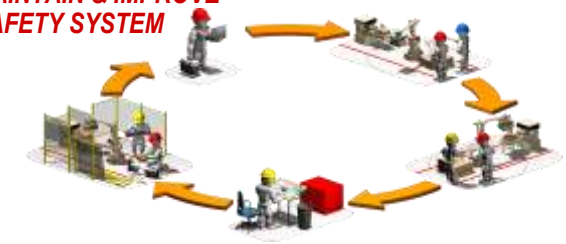


STEP 4
SAFETY SYSTEM INSTALLATION & VALIDATION

- Provides oversight
  - Validation plan complete, compliant and documented
  - Executes validation plan… safety functions tested to ensure performance
- Confirms effectiveness of solution
  - Listen for concerns about unnecessary tasks
  - Identify unforeseen conditions / consequences
- Check Point…Are all team priorities are satisfied?

Safety Professional's Role: *Maintenance*

STEP 5
MAINTAIN & IMPROVE SAFETY SYSTEM

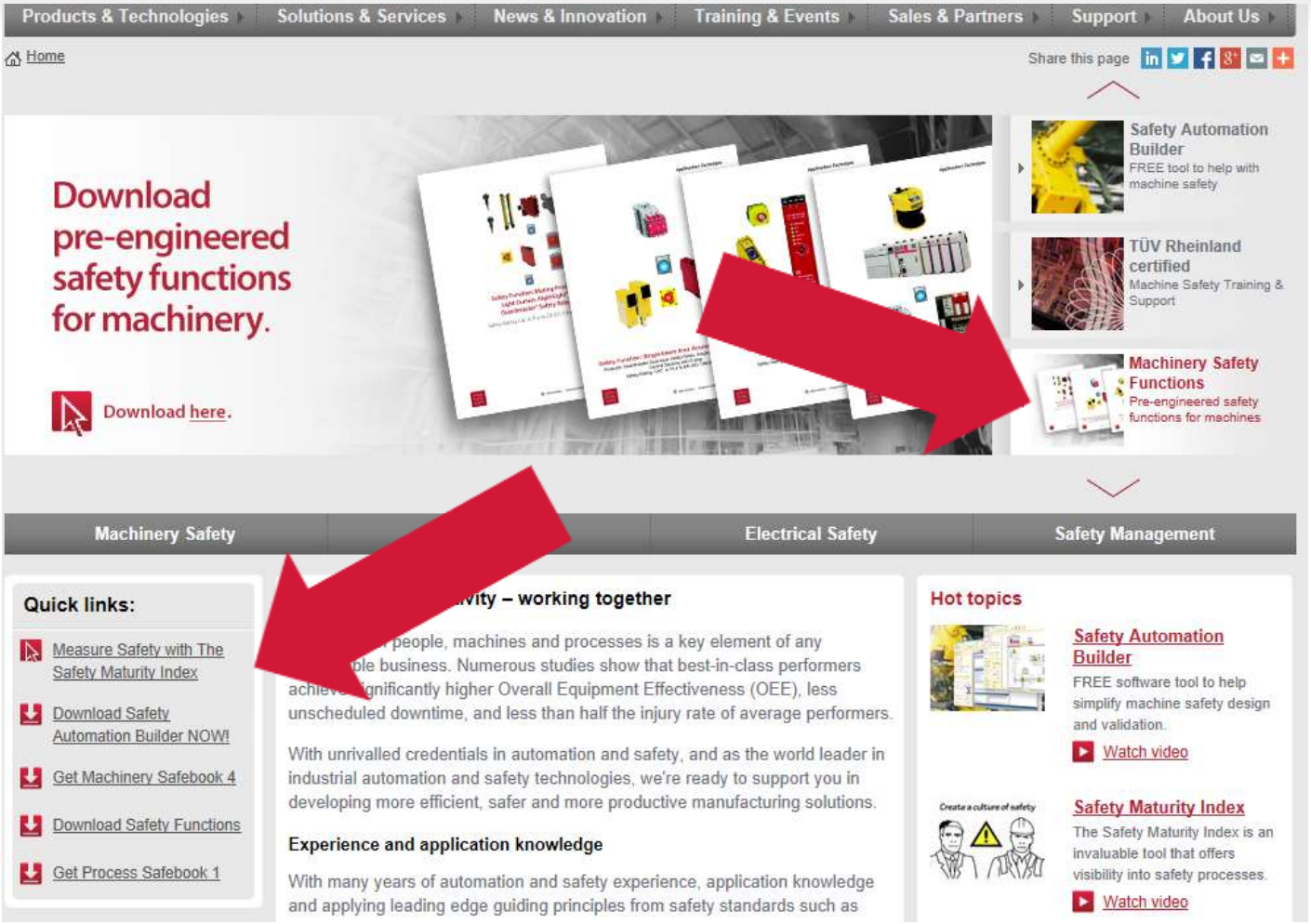


- Provides oversight for safety functions
  - Formalized plan for
    - Periodic maintenance
    - Scheduled replacement of critical components
    - Scheduled testing of critical components
  - Execution of maintenance plan
- Leads effort to re-evaluate safety function to coincide with system improvements
- Periodic review of safety functions to ensure long term compliance with evolving standards
- Periodic review of safety functions to leverage new technology

Things to Remember

- Getting employees engaged is worth it, and machine safety is a great place to do it!
  - We must understand human interaction to understand risk
  - There are only two possible outcomes if you choose the wrong safeguard
- This is not the Nike commercial, and you can't "Just Do It"!
  - Establish the "Circle of Safety"
  - Be prepared to hear the answers to the questions you ask!
  - Ensure your organization values the information
- Stay engaged through every step

For More Information:



http://machinesafetysolutions.com

LISTEN. THINK. SOLVE.®

Have a Safe and Productive Day!

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