DON'T LAG BEHIND...

DEVELOP A LEADING INDICATOR PROGRAM THAT WILL IMPROVE LAGGING METRICS

James A. Woodward Sr., MS

1

INTRODUCTION

- Father of 3
- Youth Baseball Coach
- Youth Basketball Coach
- Tournament Director
- Baseball Umpire
- ASSP Chesapeake Chapter President

2

INTRODUCTION

- University of Baltimore 2005- BA
- University of Baltimore 2007- MS
- Safety Director- McLean Contracting Company

3

TYPE OF WORK PERFORMED

McLean

HEAVY CIVIL & MARINE CONSTRUCTION

- Bridge Construction
- Demolition
- Substructure Repairs
- Piers & Bulkheads
- Marine Terminals
- Heavy Lifts
- Marine Salvage

4

KEY CROSSING RELIABILITY INITIATIVE

5

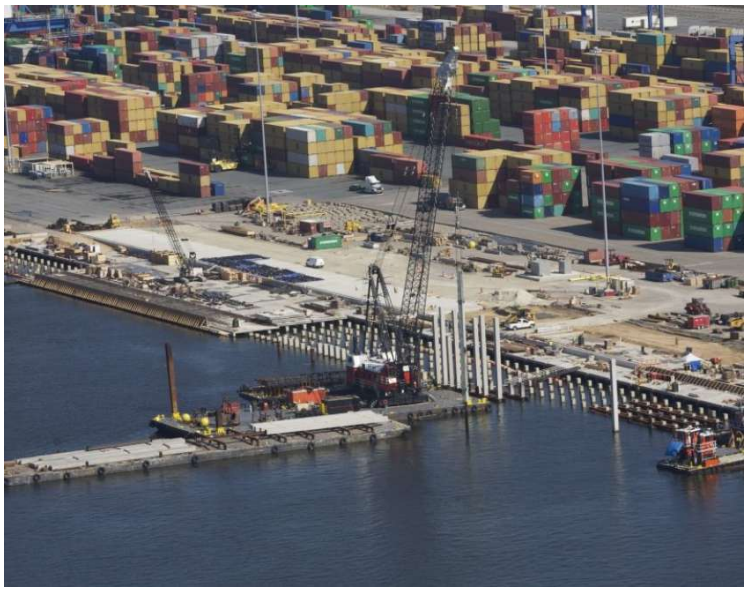
HARRY NICE BRIDGE (301- MD TO VA)

6

DOVER ROAD BRIDGE (EASTON, MD)

7

SEAGIRT MARINE TERMINAL (BALTIMORE, MD)



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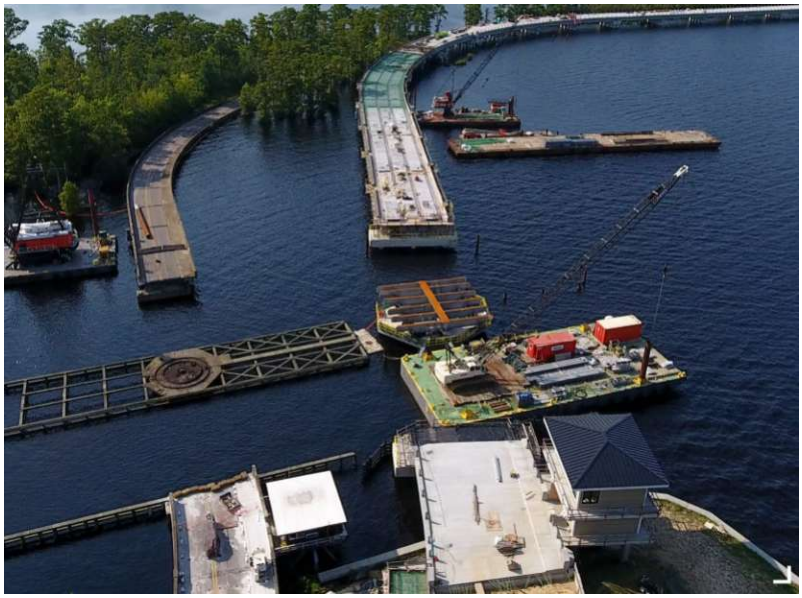
PERQUIMANS RIVER SWING SPAN BRIDGE (HERTFORD, NC)



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HUGH LEATHERMAN TERMINAL (CHARLESTON, SC)

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DIVISIONS

- Construction
- Diving
- Dredge
- Traffic Division- Lighting/Signage
- Shugart Barge Manufacturing
- Smith Brothers Rental

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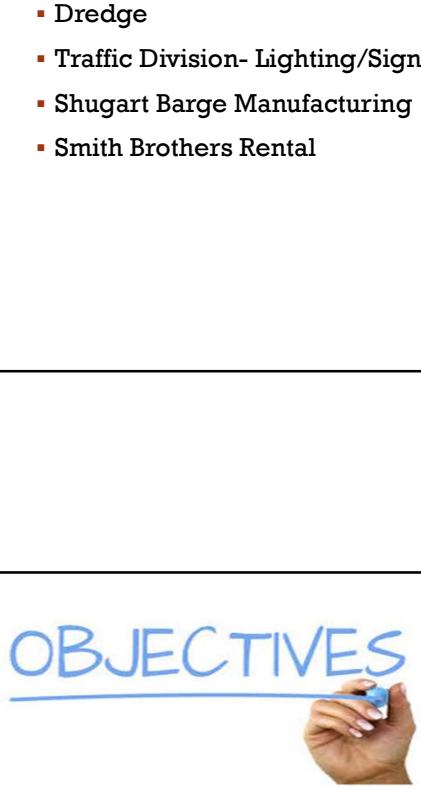

- Approaches to Safety
- Lagging v. Leading Indicators
- How is Safety Defined?
- Example of a Leading Indicator Program
- Lagging Indicator Statistics & Summary

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APPROACHES TO SAFETY

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SAFETY 1

Traditional approach to safety, where errors are responded to reactively.

- Focuses on identifying causes of adverse events
- Responds to errors and implements corrective actions
- Often assumes that worker behavior is the causal factor
- Traces the event from the outcome to the cause

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SAFETY 2/NEW VIEW/SAFETY DIFFERENTLY

Safety 2 is an approach to safety management that focuses on understanding why things go right in a system, rather than solely analyzing what goes wrong.

- Proactive Approach
- Assumes That People Make Mistakes- FAIL SAFE
- Blame Doesn't Worker
- The Workers are the Solution, not the Problem
- Learning is Key to Improving
- Response Matters

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HUMAN AND ORGANIZATION PERFORMANCE (HOP)

HOP is a framework for improving how people work together in an organization. It's based on the idea that people make mistakes and that learning is the best way to improve

- People Make Mistakes
- Blaming the Worker is Ineffective
- Behavior is Driven by Context
- Learning is Key to Improving
- Your Response Matters

ALIGNS DIRECTLY WITH SAFETY 2

16

BEHAVIOR-BASED SAFETY (BBS)

BBS is a workplace safety program that aims to reduce accidents and injuries by changing employee behaviors. BBS programs use behavior psychology to encourage safe behaviors and create a safety culture.

- Observation
- Feedback
- Reporting
- Analysis of Behavior
- Corrective Actions

SAFETY 1 or SAFETY 2

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LAGGING V. LEADING INDICATORS

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WHAT IS A LAGGING INDICATOR?

- Lagging indicators measure the occurrence and frequency of events that occurred in the past, such as the number or rate of incidents and their severity.

SAFETY 1

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LAGGING INDICATOR- EXAMPLES

- TRIR
- DART
- LTIR
- EMR

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WHAT IS A LEADING INDICATOR?

- Leading indicators are proactive, preventative, and predictive measures that provide information about the effective performance of your safety and health activities. They measure events leading up to injuries, illnesses, and other incidents and reveal potential problems in your safety and health program.

SAFETY 2

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LEADING INDICATOR- EXAMPLES

- Safety Assessments
- Near Miss Reports
- Safety Training
- Job Briefs
- Task Planning

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WHAT'S THE DIFFERENCE?

LAGGING INDICATORS

- Reactive measures that document past performance
- Detail 'what has already happened,' such as incidents and injuries
- Used to evaluate PAST effectiveness of your safety program

LEADING INDICATORS

- Proactive in identifying any risk factors
- Focuses on future safety performance and continuous improvement
- Connects key performance indicators to specific health and safety program goals
- Utilizes Workers to Identify Weaknesses in Processes

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HOW IS SAFETY DEFINED?

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SAFE·TY

the condition of being protected from or unlikely to cause danger, risk, or injury.

-Oxford Languages

25

SAFE·TY

The state of being free from danger, harm or loss.

-Meriam-Webster Dictionary

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SAFE·TY

Acceptable risk.

-Unknown

27

27

SAFE·TY

Acceptable risk.

-Unknown

28

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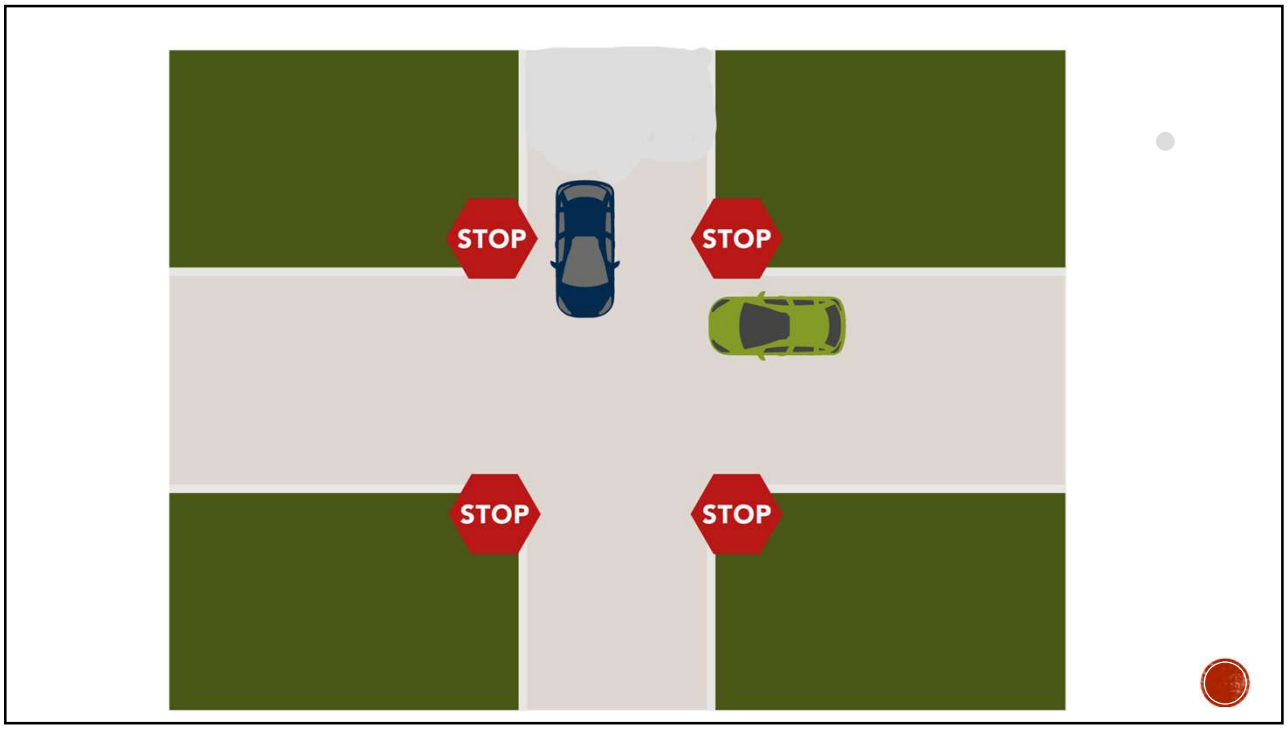

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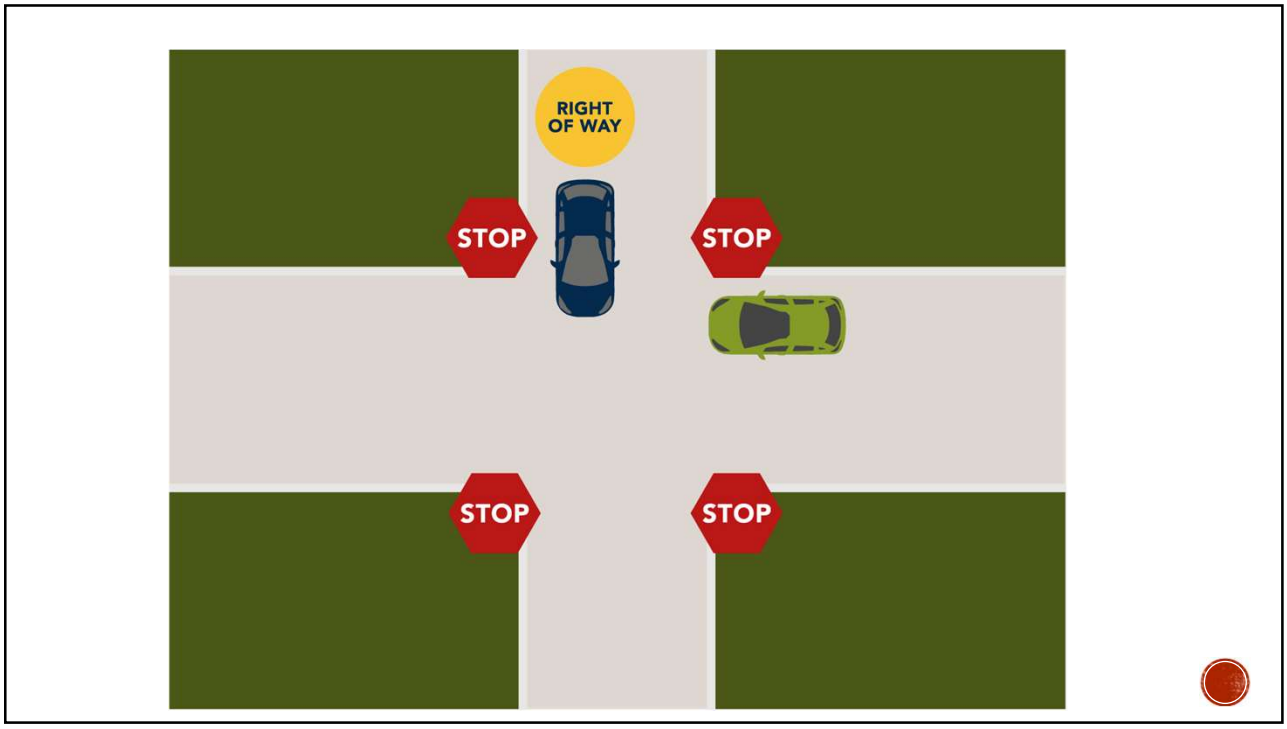

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SAFE·TY

The absence of incidents.

-Principle of 'Safety 1'

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SAFE·TY

The presence of capacities

OR

The presence of control measures

-Principles of Safety 2

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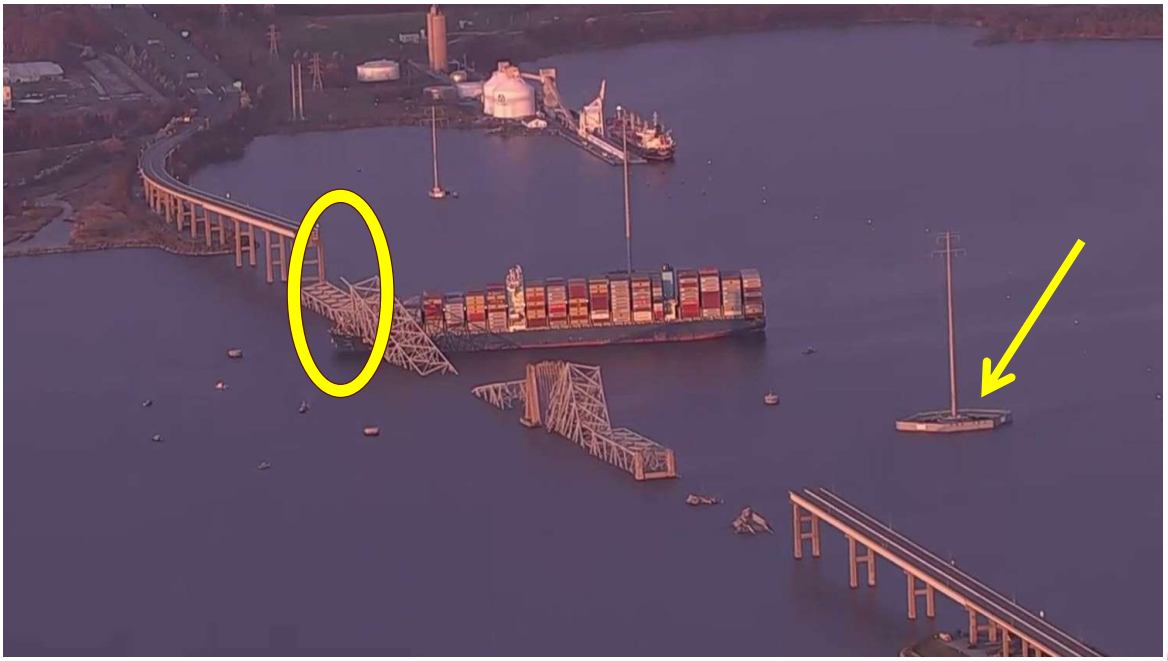

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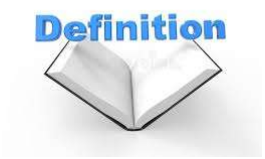
RUNAWAY
TRUCK RAMP
CLOSED
TRUCK
SPEED
LIMIT
35
RADAR
ENFORCED

40

SAFE-TY



The presence of capacities

OR

The presence of control measures

-Principles of Safety 2

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COMPONENTS OF A LEADING INDICATOR PROGRAM

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LEADING INDICATOR COMPONENTS

EHS TEAM & MANAGEMENT

- Job Brief Audits
- Safety Assessments
- Boots on the Ground Walks
- After Action Review

TRAINING

CRAFT WORKERS

- BOSS Cards
- Near Miss/Good Catch Reports
- Job Briefs
- Safety Committee
- $afety Dollar$

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KPA

OVERVIEW

- Complete Safety Management System
- Completely Customizable
- Cost Based on Number of Users

USES

- Training Tracker
- BOSS Cards
- Safety Assessments
- Equipment Inspections
- Near Miss Reports
- Incident Management
- APP utilized by all team members

Much More…

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TRAINING

- Welcome Week/Steel-Toe Boot Camp
- Safety Supervisor Training
- Fall Protection Competent Person
- Crane Safety for Beginners
- Advanced Crane Safety
- Rigger I & Rigger II
- First Aid/CPR Training
- Equipment-Based Training

FOCUS ON:

- Energy-Based Hazard Recognition

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HAZARD RECOGNITION: THE ENERGY WHEEL

- Energy Creates Hazards
- Every Hazard comes from an Energy Source
- There are 10 Sources of Energy

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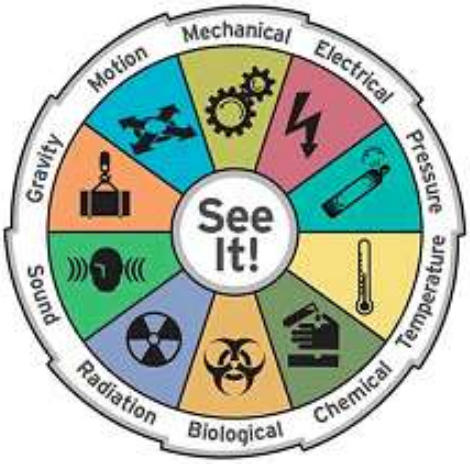
10 SOURCES OF ENERGY

- MECHANICAL
- ELECTRICAL
- PRESSURE
- TEMPERATURE
- CHEMICAL
- BIOLOGICAL
- RADIATION
- SOUND
- GRAVITY
- MOTION



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- Recognize Energy Sources
- Identify Corresponding Hazards
- Implement Effective Controls

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HAZARD IDENTIFICATION

HAZ-ARD

'A POTENTIAL SOURCE OF HARM.'

Hazard recognition is the first step in situational awareness

49

What is the meaning of situational awareness?

Being aware of what is happening around you in terms of where you are, where you are supposed to be, and whether anyone or anything around you is a threat to your health and safety.

30-30-30

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PEER REVIEWED JOURNAL ARTICLE

Dr. Matthew R. Hallowell, Ph.D.
Professor- University of Colorado @ Boulder
Executive Director- Construction Safety Research Alliance

Hallowell, M. R. (2021). The Energy Wheel: The Art & Science of Energy-Based Hazard Recognition. *Professional Safety*, *66*(12), 27-33.

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DATA FINDINGS

- Examined 4,800 Worker Hours of Observation
- Workers Identified Approximately 45% of Present Hazards
- Using the Energy Wheel Increased Hazard Identification by 30%

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"Every injury is the result of some undesirable contact between a human being and an energy source."

-Dr. Matthew Hallowell

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CRAFT WORKER & MANAGEMENT INVOLVEMENT

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BOSS CARDS

- Behavior-Based Safety Tool
- Worker(s) Observed is Anonymous
- Observer Completes Electronic Card

FOCUS ON:

- Behavior Observations
- Coaching Moment
- Identifying Present Energy Source & Corresponding Hazards
- Hazard Control Method
- Communication of Unsafe Observations

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NEAR MISS/GOOD CATCH REPORTS

- Observer Completes Electronic Report
- Notification Email Sent Immediately to Division Manager & Safety Director

FOCUS ON:

- Identifying & Correcting Unsafe Conditions
- Identifying Present Energy Source & Corresponding Hazard
- Communication Among Management & Crew
- Prevention of Future Events
- Communication between Management & EHS Team

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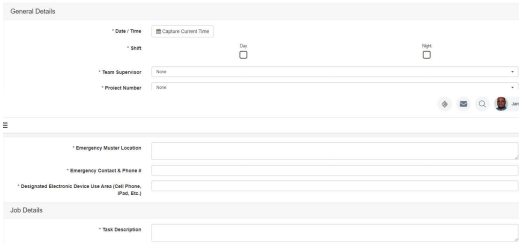
JOB BRIEFS

- Completed by Every Field Supervisor, at the Start of Each Shift
- Facilitated as a Group Conversation

FOCUS ON:

- Planning
- Tasks/Goals for the Shift
- Energy Sources/Hazard Exposure
- Control Measures
- Communication of Expectations



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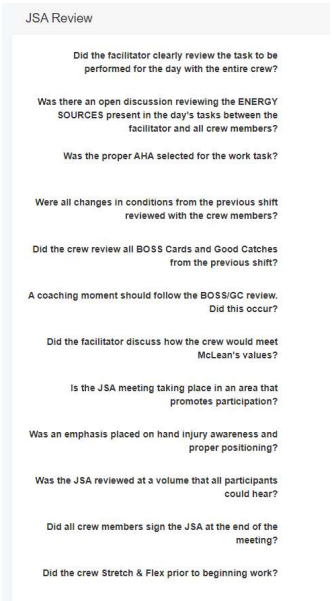
JOB BRIEF AUDITS

- Facilitated by a Member of the EHS Team OR Management
- Electronic Form Completed and Shared with Supervisor

FOCUS ON:

- Evaluating Quality of Job Brief
- Communicating Constructive Feedback to Field Supervisors



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SAFETY ASSESSMENTS

- Facilitated by a member of the EHS team
- Form Completed Electronically
- Findings Shared During Project's Safety Meeting
- Action Items Assigned by Project Management

FOCUS ON:

- Regulatory Compliance

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BOOTS ON THE GROUND WALKS

- Completed by Members of Management- TIED TO INCENTIVE
- EHS Team Member, Craft Worker, Member of Management in Attendance
- Safety Assessment Completed w/EHS Team Member
- BOSS Card Completed by All Management Participants
- Findings Reviewed at Next Project Safety Meeting

FOCUS ON:

- Behavior Observation
- Observation of Safe/Unsafe Conditions
- Management Involvement

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AFTER-ACTION REVIEW

- Occurs When an Event had SIF Potential
- Detailed Investigation
  - Incident Summary
  - Witness Statements
- 5 Why's Facilitated by Investigator (EHS Team Member)
- Investigator Facilitates After Action Review Meeting

FOCUS ON:
- Identifying Present Energy Source & Corresponding Hazards
- Evaluating Means and Methods
- Improving Processes
- Assigning Action Items & FOLLOW-UP
- Subject Matter Expert Follow-Up (aka Learning Teams)

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AFTER-ACTION REVIEW- SUBJECT MATTER EXPERT FOLLOW-UP

- Group of 'Experts' in a Specific Craft/Trade
- Review Incident
- Discuss 'What Went Wrong?'
- Determine Modifications to Improve Processes
- Communicate to Entire Team

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SAFETY COMMITTEE

- Meets Monthly
- Representatives From Each Division
- Facilitated by a Member of EHS Team
- Minutes Shared w/Team
- Feedback Provided by Safety Director and Division Managers

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$AFETY DOLLAR$

- BOSS Cards
- Near Miss/Good Catch Reports
- Toolbox Talk Facilitation
- JSA Facilitation
- After Action Review Involvement
- Toolbox Talk Monthly Quiz
- Safety Committee Participation
- Participate in Safety Assessment
- Spot Awards by Management

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$AFETY DOLLAR$ CATALOG

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LAGGING INDICATOR RESULTS & SUMMARY

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LAGGING INDICATORS

McLean

2023

3 OSHA Recordable Incidents

601,000 Man Hours

- .99 TRIR
- .99 DART
- .57 EMR

2024

6 OSHA Recordable Incidents

787,000 Man Hours

- 1.52 TRIR
- 1.25 DART
- .48 EMR

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WHY LAGGING INDICATORS MATTER

- Measure Past Results
- May Predict Trends
- Data is Measurable
- Identify Weaknesses
- Lagging Indicators are How Companies are Measured

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HAZARD EXPOSURE DATA

- Value & Frequency Rate Assigned
  - BOSS Cards
  - Near Miss/Good Catch Reports
  - Incidents
- 1 of 10 Energy Sources Identified
- 1 of 40 Corresponding Hazards Identified
- Formula Demonstrates 'Most Frequent Hazards'
- Develop a Company-Based 'Frequent Five' for 2025 & Beyond

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HAZARD EXPOSURE DATA- YTD

TOP 3

1) GRAVITY- Same Level Falls
2) MOTION- Contact with Sharp Objects
3) MOTION- Moving Equipment

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LESSONS LEARNED

- Don't Try to Do Too Much at Once
- Listen to Your Safety Committee- 'Workers are Problem Solvers'
- Be Able to Demonstrate Cost Savings to Management
- Don't Be Afraid to 'Try Something'
- Be Swift in Making Changes if a Program Isn't Working
- Training is Continuous
- A Quality Leading Indicator Program is a Living Document

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WHAT DOES IT TAKE TO IMPLEMENT AN EFFECTIVE PROGRAM?

- Buy-In From Field Supervisors
- Commitment from EHS Team Members
- Continuous Review for Effectiveness
- Management Support at All Levels

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WHAT DOES IT TAKE?

- Buy-In From Field Supervisors
- Commitment from EHS Team Members
- Continuous Review for Effectiveness

Management Support at All Levels

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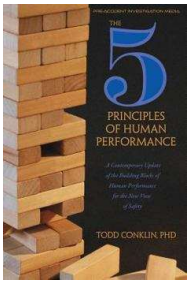
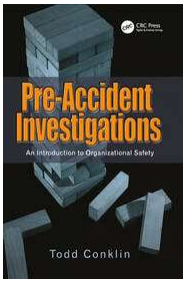
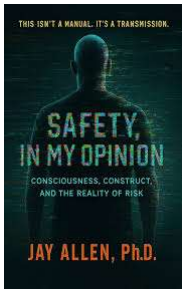
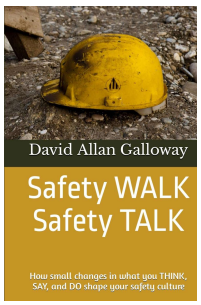
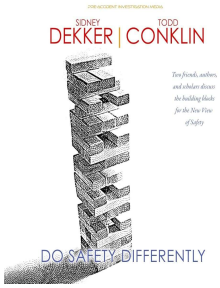
RECCOMMENDED READS

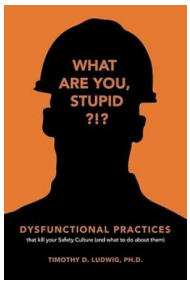












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RECOMMENDED READS

VANTAGE POINT

WHAT'S METRICS GOT TO DO WITH IT?

Revisiting the History & Utility of Safety Metrics

By Matthew P. Koss

Tina Turner the safety practitioner might ask, "Who needs metrics when metrics can be broken?" All unflattering attempts at relating 1980s pop hits to the safety profession aside, many assumptions exist about metrics in safety.

From a lagging metric perspective, Hallowell et al. (2021) proved that safety incident rates are statistically flawed and are as random as a flip of a coin. Still, business and safety leaders rely heavily, as they have done for decades, on incident rates such as total recordable incident rate (TRIR) to measure safety performance. But where did incident rates come from and how did nearly the entire safety profession accept that measuring safety by calculating TRIR is beneficial to worker safety?

It seems worthwhile to investigate the history of lagging metrics such as incident rates before we continue to hang our collective hat on their value. In contrast, organizations have shifted their focus on leading and process metrics as a forecasting method to better "predict" where the next injury might occur. As the Center for Chemical Process Safety (CCPS, 2011) describes, leading metrics "can give early indication of deterioration in the effectiveness of key safety systems and enable remedial action to be undertaken to restore the effectiveness of key barriers, before any loss of containment event takes place" (p. 28). The goal is to proactively collect safety data to prevent negative events from occurring. Given the countless options of leading metrics available, has the newfound focus on leading metrics proven its value any more than the erroneous emphasis on TRIR? Also, what is the fixation on applying metrics, leading or lagging, to safety improvement efforts? Considering the fundamental challenges that plague the safety profession such as agreeing on definitions for basic terminology (e.g., safety and risk), what makes safety leaders so sure that measuring safety in our complex world is even possible or helpful? This article aims to answer these questions by reviewing the origins of common metrics used to manage safety and the utility of such metrics, and introduces an argument that metrics do little, if anything, to improve worker safety.

Background

In 1644, René Descartes claimed, "If something exists, it exists in some amount. If it exists in some amount, then it is capable of being measured" (Descartes et al., 1994). Only in the past 150 years has the world, particularly the U.S., been so captivated by the notion of measurement. The roots of this fixation can be traced to the second industrial revolution with the development of the American system of manufacturing, which focused heavily on standardization, precision and efficiency (Vincent, 2022). Frederick Taylor's scientific management theory opened the eyes of American capitalists to a new focus on measuring worker production and efficiency. At the intersection of capitalism and the new American system, names such as Henry Ford, John Rockefeller and Andrew Carnegie come to mind as the financial beneficiaries. Even today, people still marvel at the wealth these individuals accumulated as a result of the American system (by way of measurement, standardization and efficiency).

However, the fact that business was not measured in this manner prior to the inability to measure something does not mean that it does not exist. Safety practitioners have tried desperately to find their own version of Einthoven's EKG machine to measure safety performance. There is certainly no shortage of consultants and marketing campaigns aimed at convincing organizations that they have found the secret formula that will achieve safety for their organization. It might depend more on the individual or entity being asked about metrics than the results themselves.

Descartes's quote speaks a socially constructed truth, but he obviously was not referencing worker safety in the complex world we live in today. In fact, Dekker (2018) argues that what gets measured gets manipulated. This occurs when a measure becomes a target instead of a measure and an expected goal is established. By developing a target, expectation bias is created to achieve the target. Hreha (n.d.) explains that expectation bias occurs when "people's expectations about the outcome of an event influence the results of that event."

Many examples can be found of measures that became targets and the catastrophic results that ensued. In one such example, the term "McNamara Fallacy" was coined for U.S. Secretary of Defense Robert McNamara's flawed theory of counting enemy bodies as an objective measure of success during the Vietnam War. In his theory, an increase of enemy deaths and minimal U.S. causalities represented progress toward victory. Unfortunately, the enemy body count numbers were largely inflated and

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Q & A

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THANK YOU!!!

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