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Safety's Continuing Evolution

How Science & Technology Are Being Used to Control Exposure

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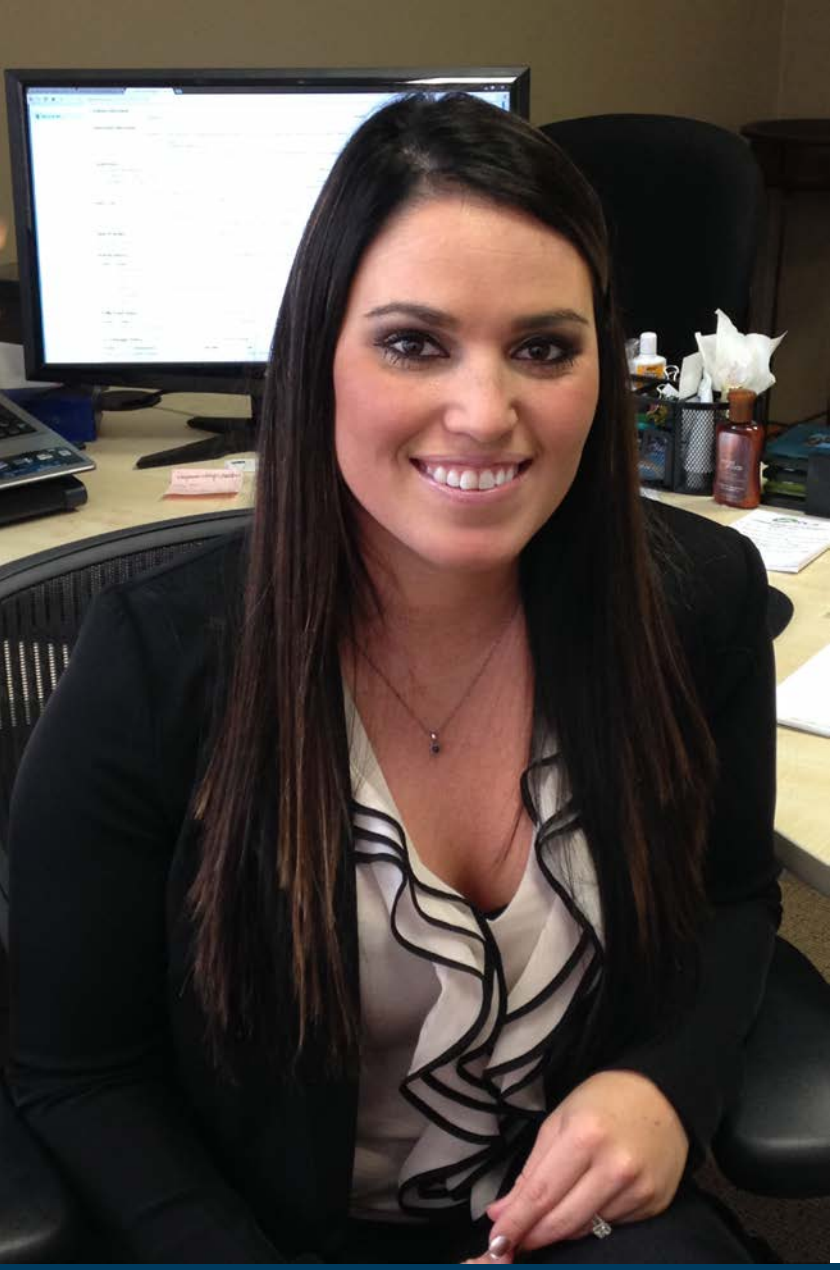
Corey Hopkins

DEKRA

Principal Consultant



Lindsey Johnson

DEKRA

Director of Sales

Safety's Continuing Evolution

How Science & Technology Are Being Used to Control Exposure

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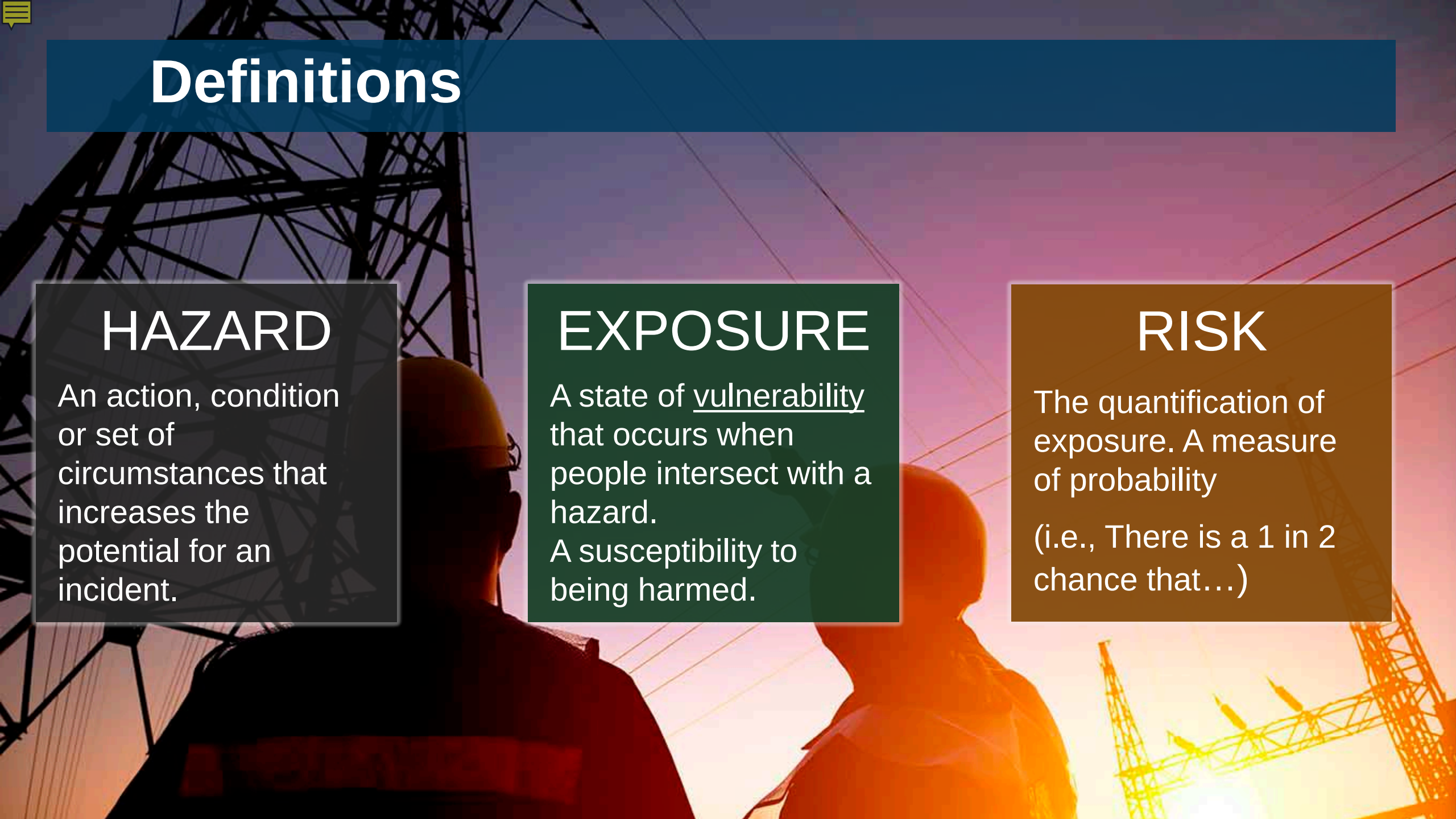
Definitions



HAZARD

An action, condition or set of circumstances that increases the potential for an incident.

EXPOSURE

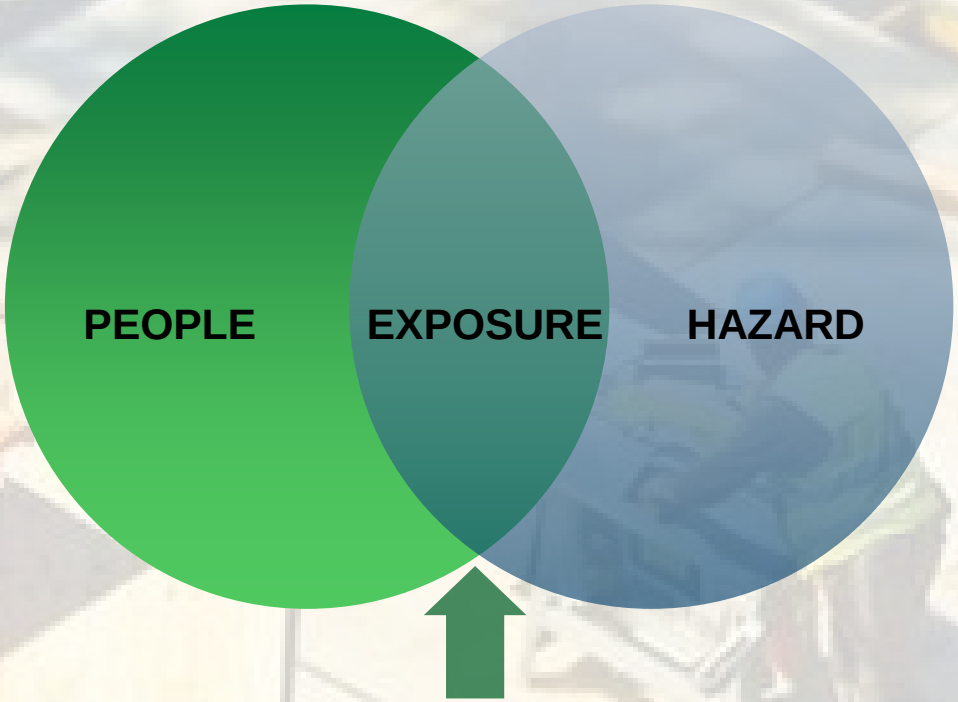
A state of vulnerability that occurs when people intersect with a hazard.
A susceptibility to being harmed.

RISK

The quantification of exposure. A measure of probability

(i.e., There is a 1 in 2 chance that…)

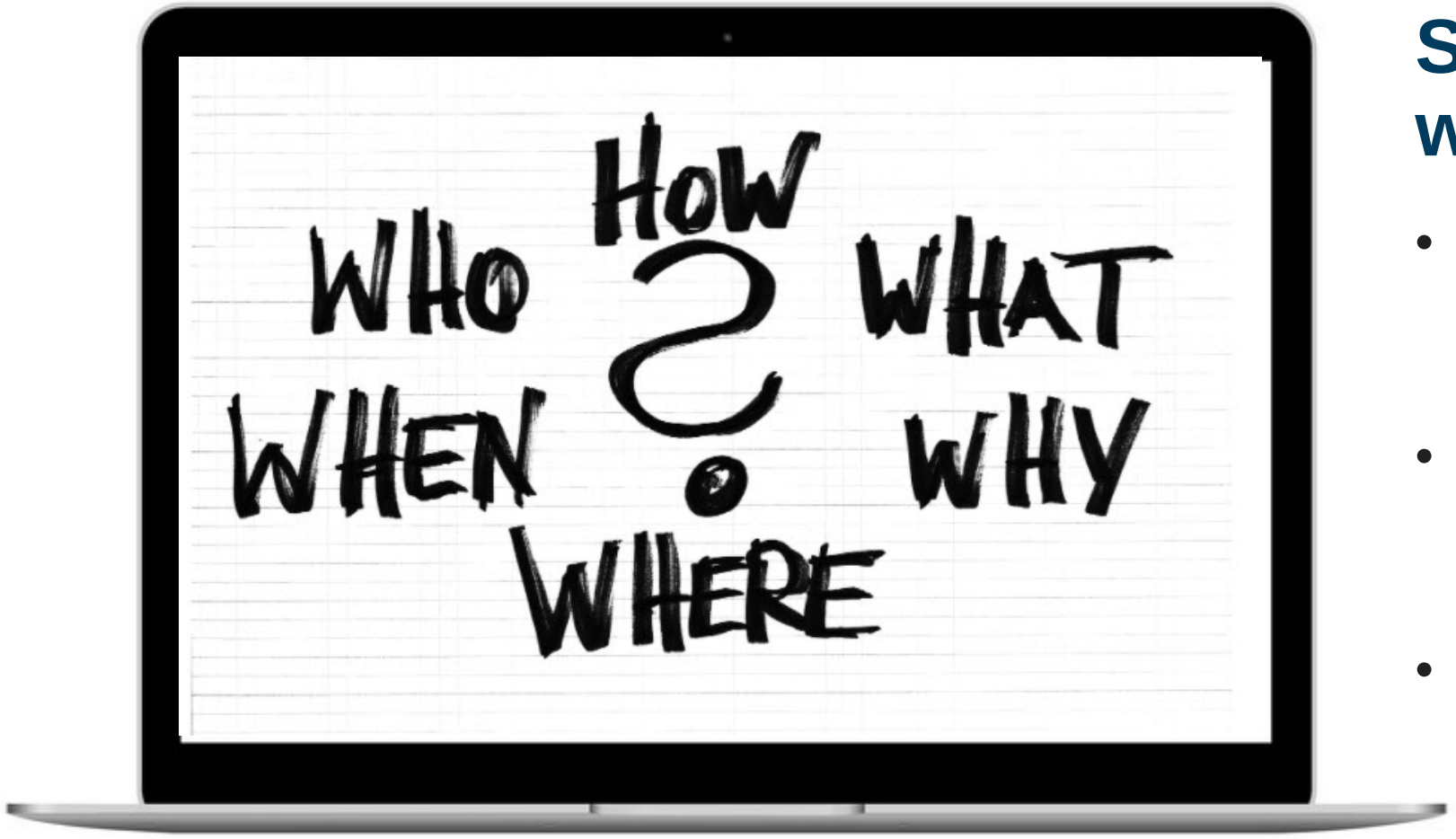
How Exposure Occurs



EXPOSURE

When people intersect with a conditional hazard or there is an action hazard.

Safety does not improve unless exposure is reduced.



So where should we start?

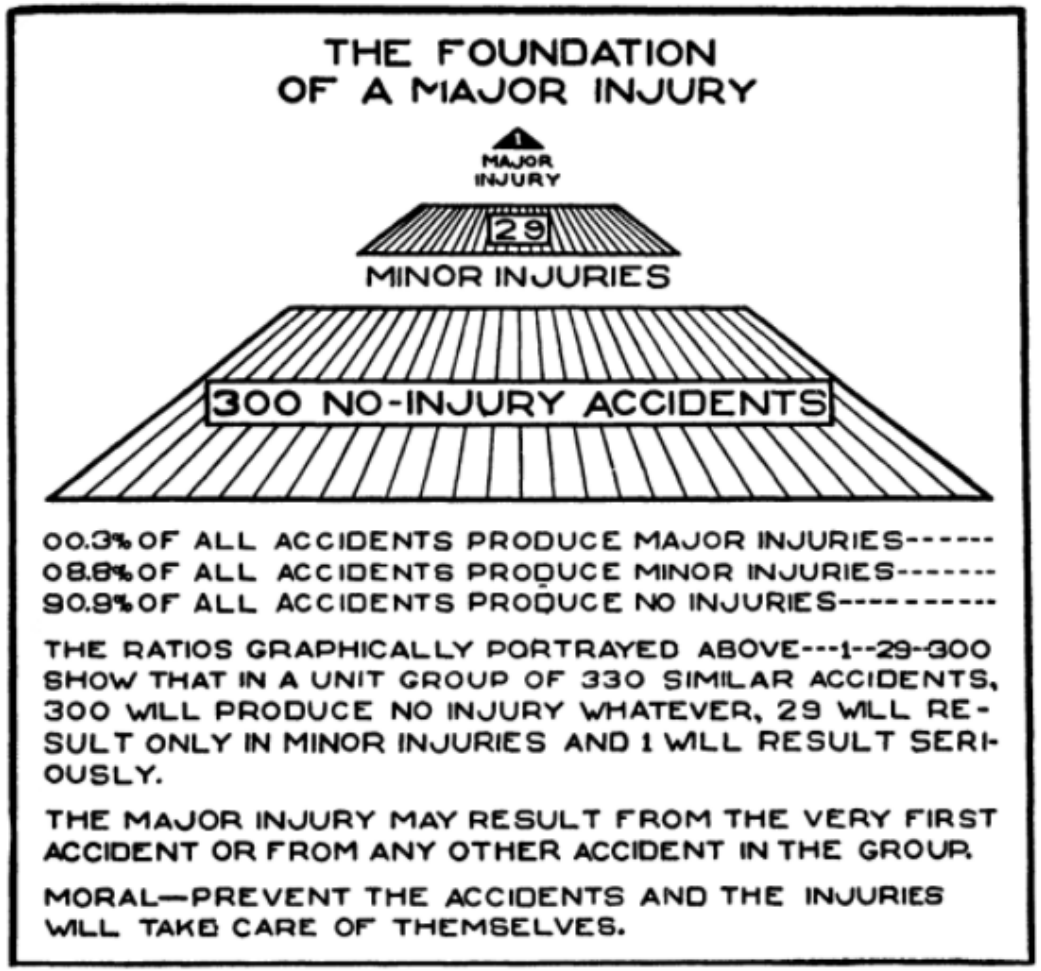
- Start with the things that can lead to Serious Injuries or Fatalities (SIFs)
- Not all incidents are created equally – treat them accordingly
- What's worse – A first aid injury or a near miss?

Serious Injury/Fatality Defined

- Fatal – Work-related fatal injury or illness
- Life-Threatening – Work-related injury or illness that required life-preserving action (significant blood loss, trauma)
- Life-Altering – Work-related injury or illness that resulted in a permanent and significant loss of a major body part or organ function

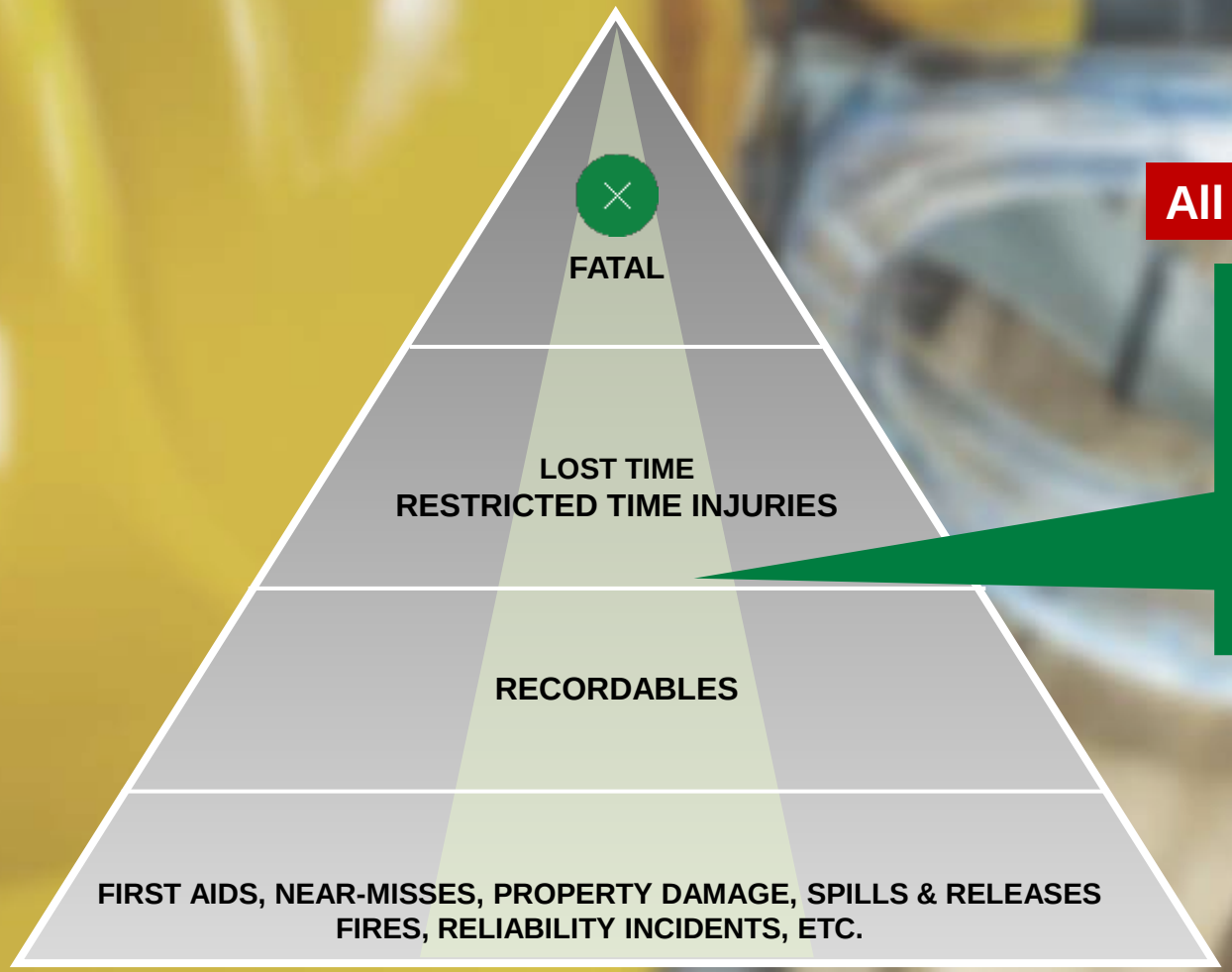
Challenging Existing Paradigms

- Heinrich's Theory – Prevent accidents and injuries take care of themselves
- Assumes that all accidents and potentials are the same



The "accident pyramid", as depicted by H. Heinrich in the second edition of his book Industrial Accident Prevention: A Scientific Approach, page 27. Note the last sentence: "Moral — prevent the accidents and the injuries will take care of themselves".

A New Paradigm



All exposure is not equal

≈25%
Have an exposure with Serious Injury or Fatal potential

How do you know if an incident or near miss has SIF Potential?

Sifpotential.com

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Controlling Exposures

How do you do it?

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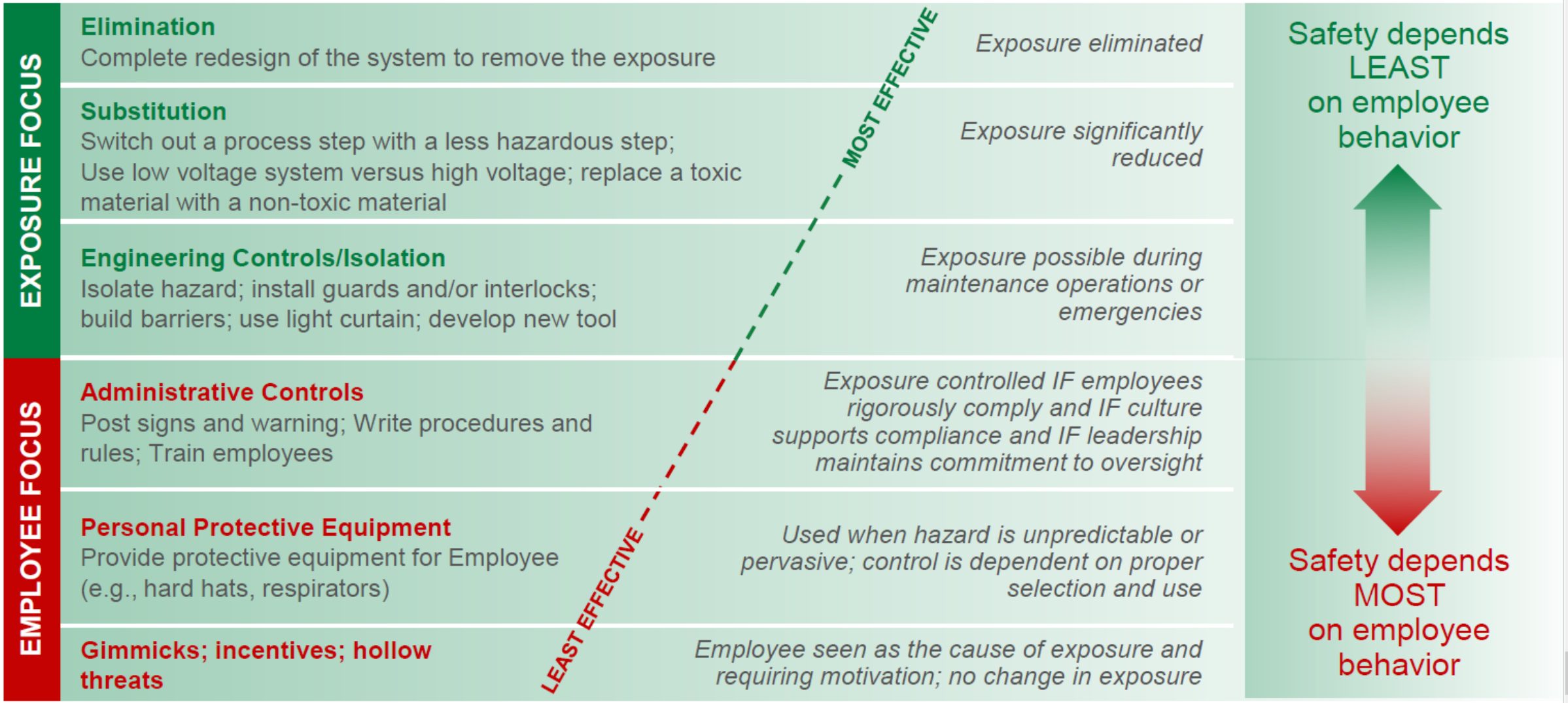
Exposure Reduction and the Hierarchy of Controls



How can we leverage technology?

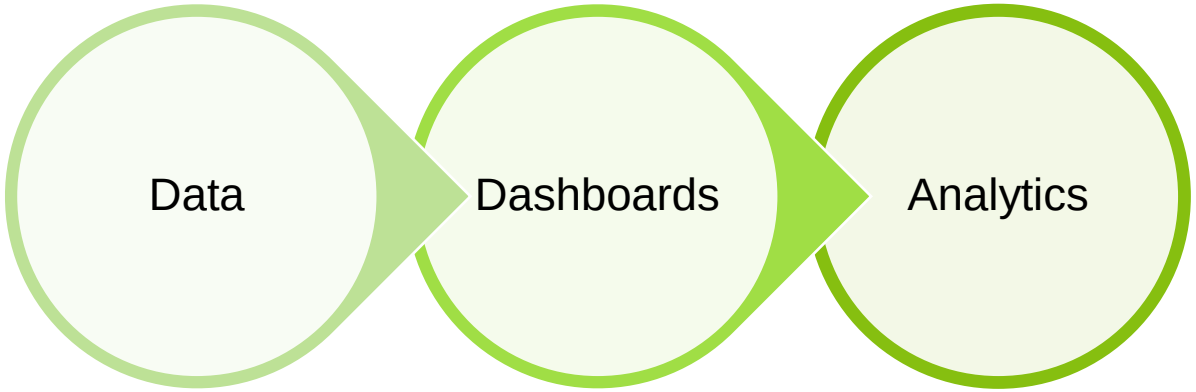
There are many ways to control exposure. Do you have a tool that gives you real time data?

If it’s a checklist you can record…
it’s data you can use

- Critical Controls
- Observations
- Audits
- Incidents / Causes
- Corrective Actions
- Action Items

Operational: What are your Critical Controls?

- Lockout / Tagout
- Electrical Safety
- Confined Space Entry
- Work From Heights
- Powered Equipment



Critical Control Checklist

Critical Control Checklist: Control of Hazardous Energy (Lock Out/Tag Out)

Instructions: Observe work activities and conditions to determine if critical controls are in place and properly functioning

		Protected	Exposed	N/A	
1	Are the involved employees able to describe how they are qualified and experienced to perform Lock Out for this task?	☐	☐	☐	
2	Are isolation devices and sources of energy clearly labeled (e.g. breaker panels, control valves, wheel chocks, blocking devices, etc.), and easily accessible?	☐	☐	☐	
3	Are involved employees wearing the appropriate PPE for the task?	☐	☐	☐	
4	Can involved employees demonstrate all energy sources have been isolated, locked, tagged, and tested to be in a zero-energy state?	☐	☐	☐	
5	Are keys and tags secured properly (e.g., in a lockbox, under control of the worker, etc.)? Is access to lockout keys restricted to the person that locked the equipment out?	☐	☐	☐	
6	Is communication with all potentially affected parties regarding energy isolation and re-energization of equipment being conducted?	☐	☐	☐	
7	If energy isolation work lasts longer than one shift, is it controlled appropriately throughout LOTO process?	☐	☐	☐	

Electrical Safety

Date
02/21/2022 1:42 PM
Location
Kansas City
Checklist
Electrical Hazards/Arc Flash
Observer
Debra Roberts (67603)
Department
Electrical
Shift
1st
Task Observed *

Observer Comment

Electrical Hazards/Arc Flash

Search | Submit And Stay | Submit

Are employees familiar with electrical hazards in the shop and in the field, and how to protect themselves from those hazards during use, maintenance, and troubleshooting?
Protected | Exposed

Are pre-task planning documents (e.g., JSA's, Job Survey, permits, etc.) in place and used when working with and around electrical hazards?
Protected | Exposed

Is the correct PPE and testing equipment provided and used while working on, with, or around electrical equipment?
Protected | Exposed

Is electrical equipment and electrical testing equipment properly designed, maintained and inspected to ensure safe condition and operation? Equipment is labeled to identify arc flash hazard, voltage/amperage, etc.
Protected | Exposed

Are employees who work on energized equipment trained and proficient on the energized work procedures.?
Protected | Exposed

Can employees adequately explain emergency procedures in the case of electrocution or arc flash explosion?
Protected | Exposed

Are employees trained, qualified, and do they know how to perform lock out and tag out? (See CC Checklist on Lock Out/Tag Out)
Protected | Exposed

Submit And Stay | Submit

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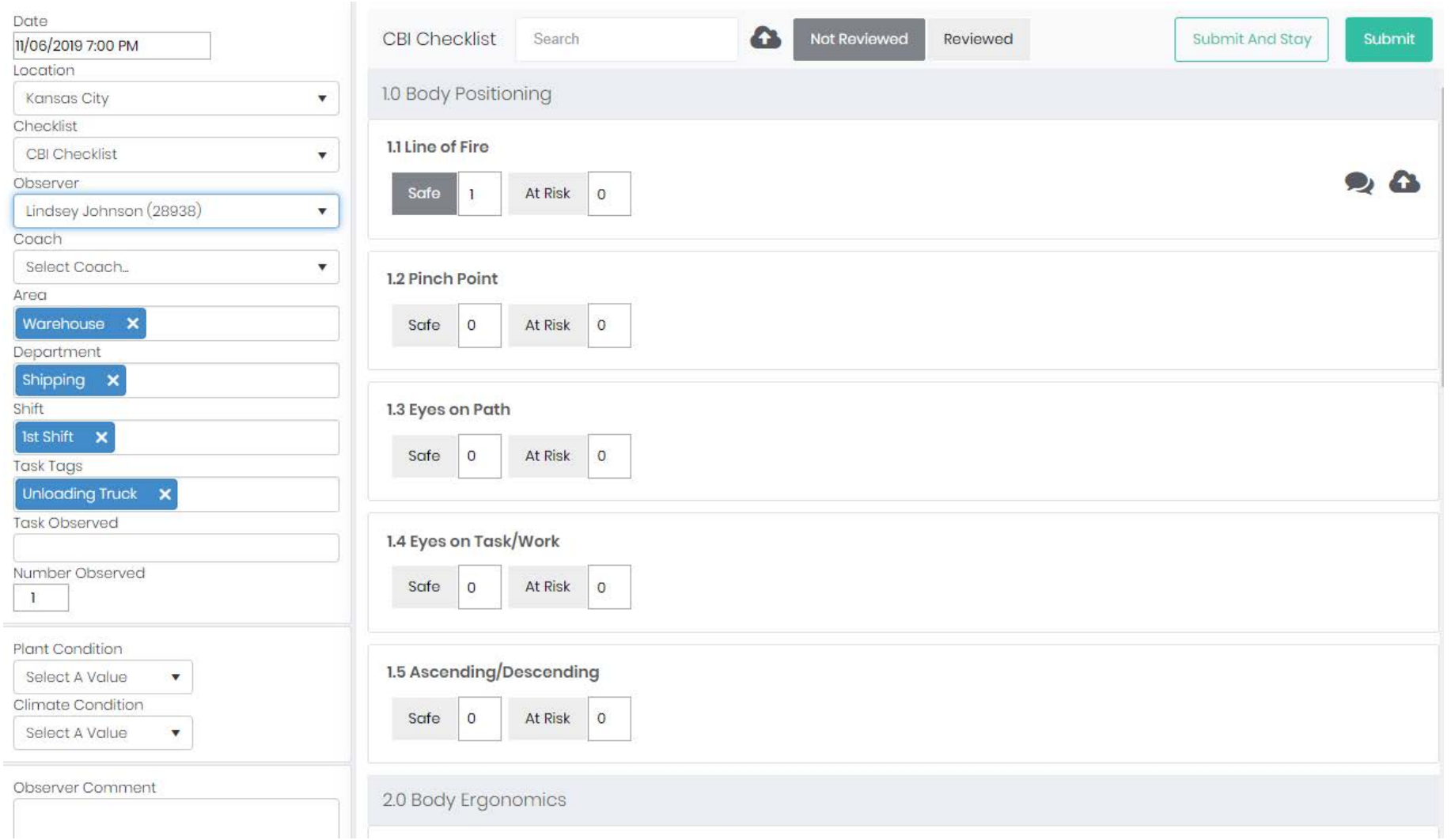
Observation Checklist



AUDITS

Incident Form

Case ID: 35983
Incident ID: 458963

Cancel | Save

General Information | Person Information | Incident Information | Injury Information | Additional information | Work Comp Information | SIF Potential | Actions

Injury Classification:

- (•) Injury
- ( ) Skin Disorder
- ( ) Respiratory Disorder
- ( ) Poisoning
- ( ) Hearing Loss
- ( ) Other Illnesses

Nature of Injury:

7 - Concussion

Body Part:

12 - Brain

Side of Body:

( ) Left ( ) Right ( ) Both Sides of Body (•) NA

Cause of Injury:

Fall or Slip

Ladder/Scaffolding

Was person treated

( ) Yes ( ) No

If yes facility info here

Was person treated in an emergency

( ) Yes ( ) No

Was person kept inpatient overnight?

( ) Yes ( ) No

Comments:

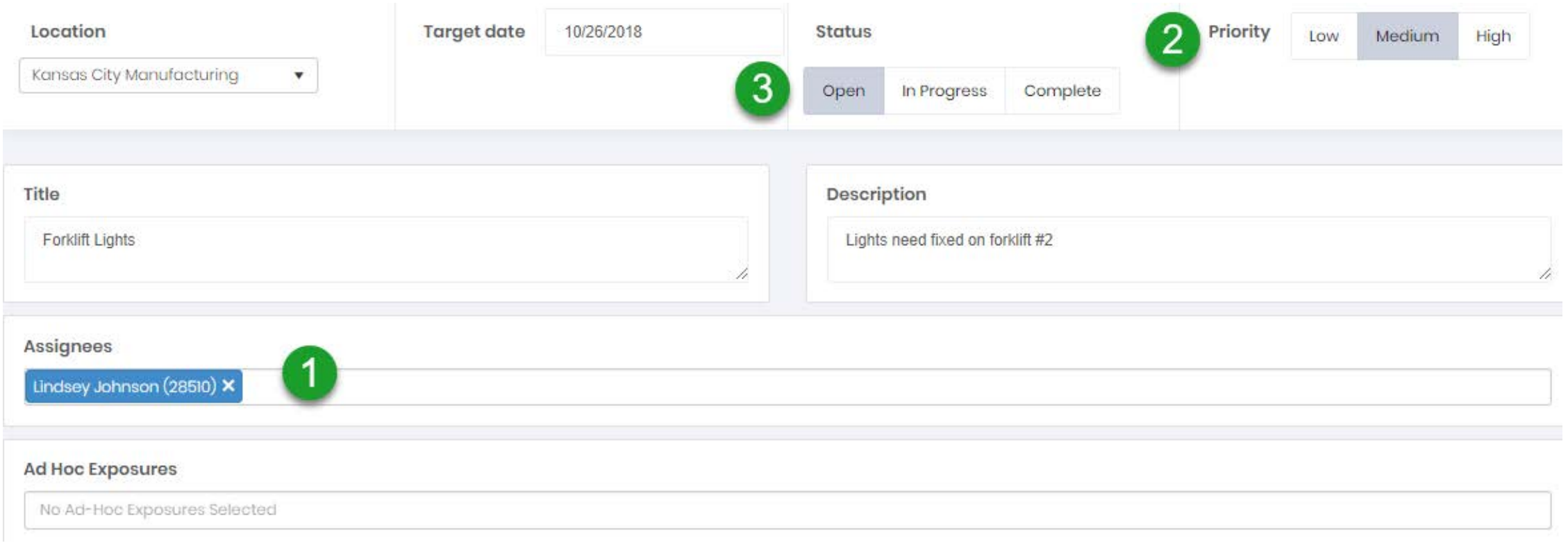
Pick the most serious condition:

- ( ) Injury caused the employee to be transferred from their regular duties or was restricted from performing their regular duties.
- ( ) Injury caused employee to miss work
- ( ) Injury caused loss of consciousness or restriction of work or motion, or medical treatment other than first aid. (Other recordable
- ( ) Death occurred
- ( ) First Aid

Is This Incident Recordable?

( ) Yes ( ) No

Corrective Actions



The Science of the Human Brain

Fast Brain vs Slow Brain

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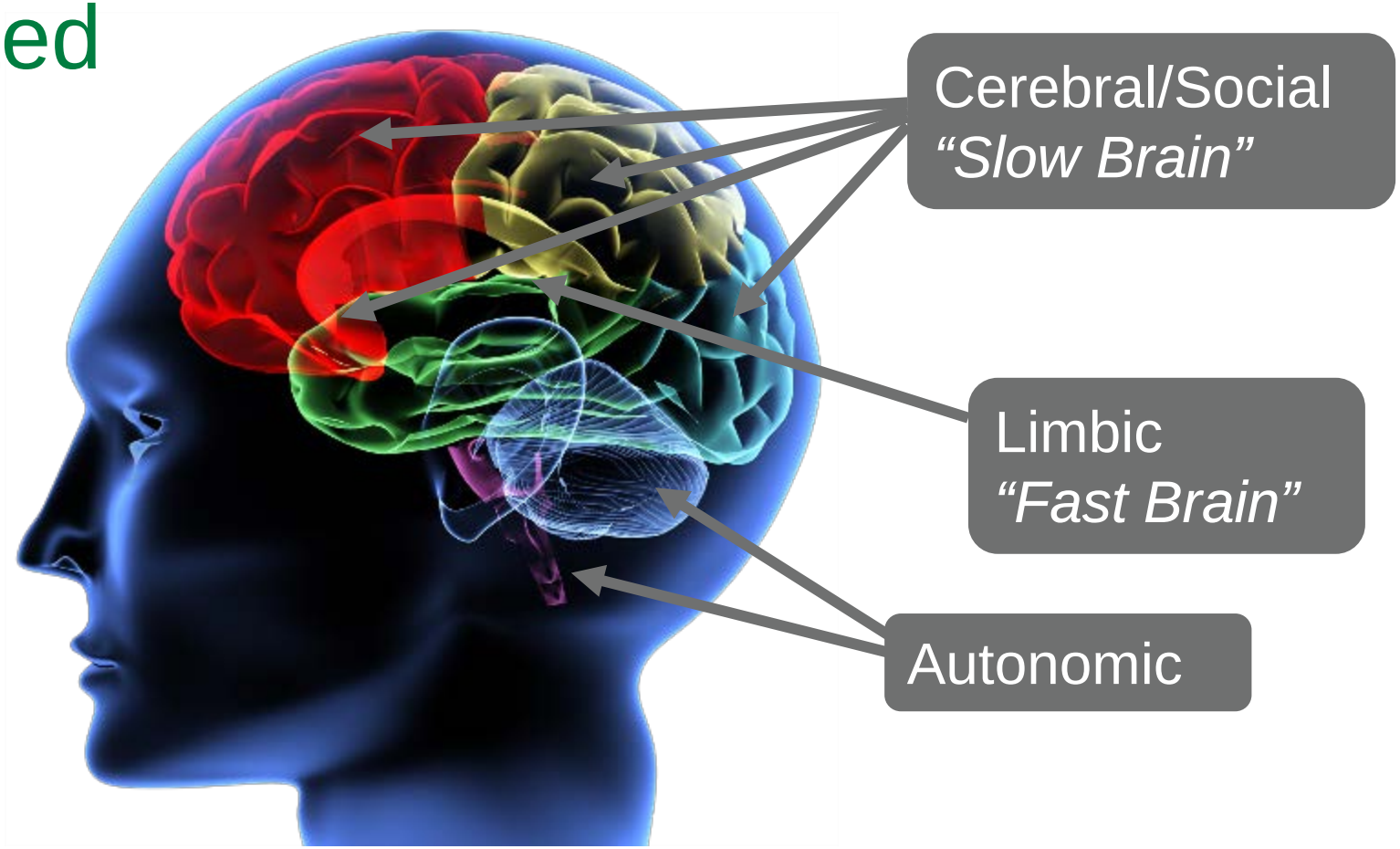
Raise your hands

Who feels like they are a good multi-tasker?

The Human Brain

Multiple Nested Systems

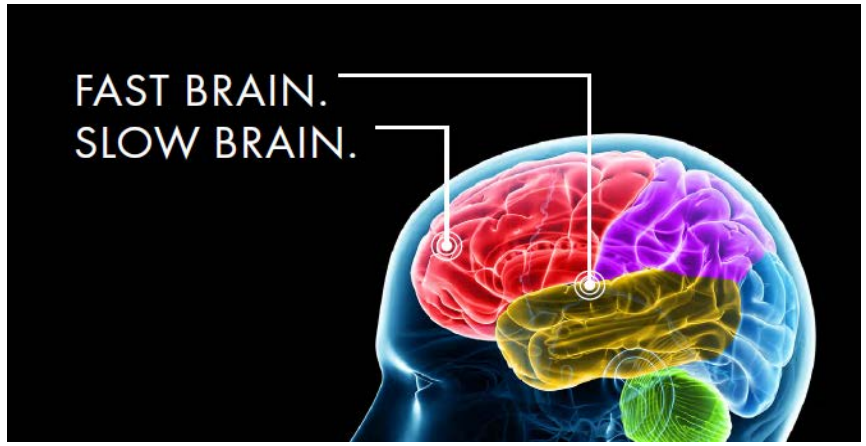


Fast Brain characteristics:

- Pre-Conscious
- Reactive
- Habitual
- Can’t Troubleshoot

Slow Brain characteristics:

- Conscious
- Analytical
- Reasoned
- Reflective
- Intentional



Fast Brain

Time it takes the to trigger habit actions:

4/10 of a second

Slow Brain

Time it takes to “wake up” before we can start paying attention:

5/10 of a second

A Proactive Approach

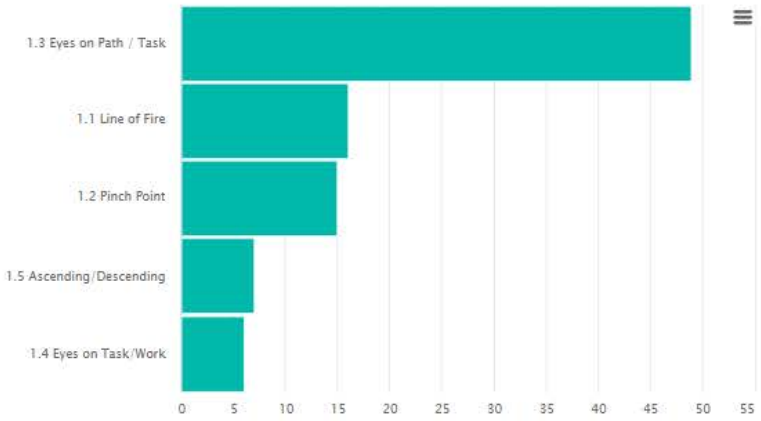
Rather than waiting for variances to occur, seek them out proactively

Dashboard

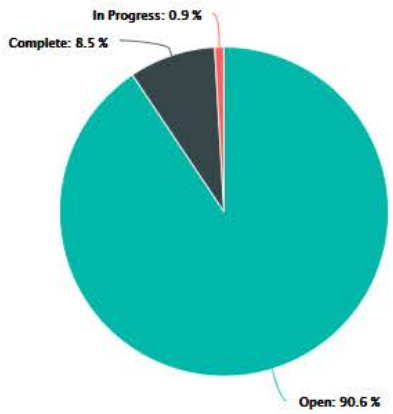
Review Rate	Coaching Rate	Observation Quality	% Safe
48%	14%	★★☆☆☆	78%

Contact Rate	High Severity Potential	Participation Rate	Total Observations
0.08	3	14%	109

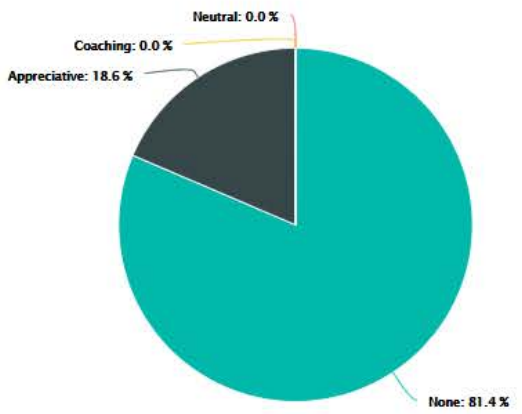
At-Risk Exposures



Action Item Status



Observer Feedback



Example – Company Using Peer to Peer Observation Process

133 Incidents

17 with SIF potential - 12.7%

- 7 Vehicle Accidents
- 5 Falls
- 3 NH related
- 1 Heat Exhaustion
- 1 Hazardous Chemicals

Process Leads to Much Higher Visibility of SIF Potential Issues

2020 SIF P Count	2020 SIF p %	2021 SIF P Count	2021 SIF p %
30	2.41%	20	2.28%
34	1.10%	21	0.80%
19	1.42%	13	1.22%
70	2.83%	45	2.19%
1	0.22%	3	0.89%
22	0.94%	11	0.62%
10	0.45%	3	0.18%
152	3.13%	139	3.53%
96	3.31%	77	3.24%
56	1.83%	26	1.16%
34	1.45%	26	1.28%
524	1.99%	384	1.83%

Checklist name	Observer	Observer Comment	Exposure Name
Critical Behavior Inventory	AdamRoss	Machine not locked	Lockout/Tagout/De-energize ⚠
CBI	AnnSanders	Machine not locked out	Lockout/Tagout/De-energize ⚠
Critical Behavior Inventory	AdamRoss	Machine not locked	Lockout/Tagout/De-energize ⚠

High Severity Potential

- Issue with Lockout/Tagout
- Machine not locked
- Driving Forklift

Employee Engagement

Engagement tracking to know where to intervene

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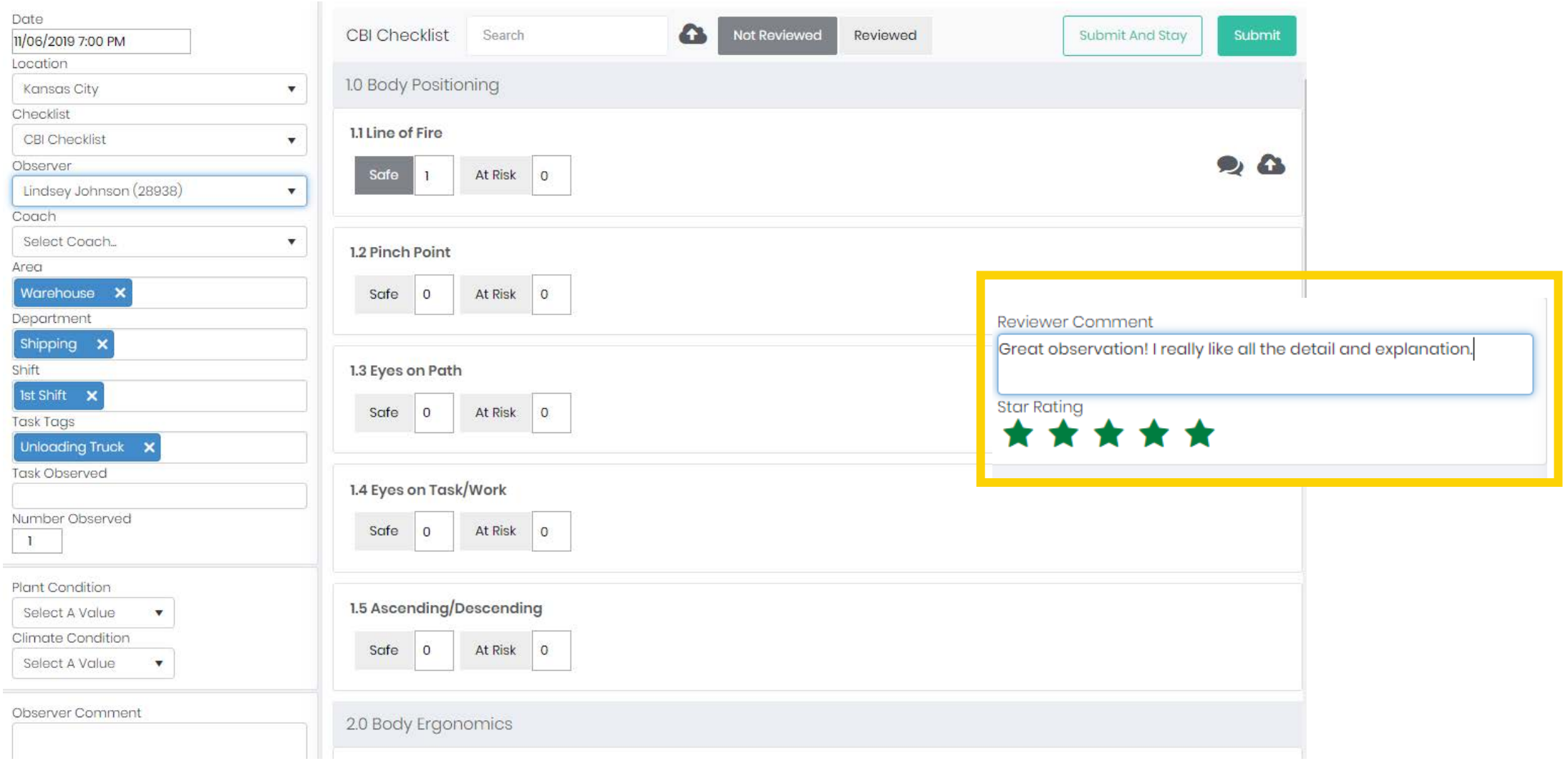
Observation Checklist

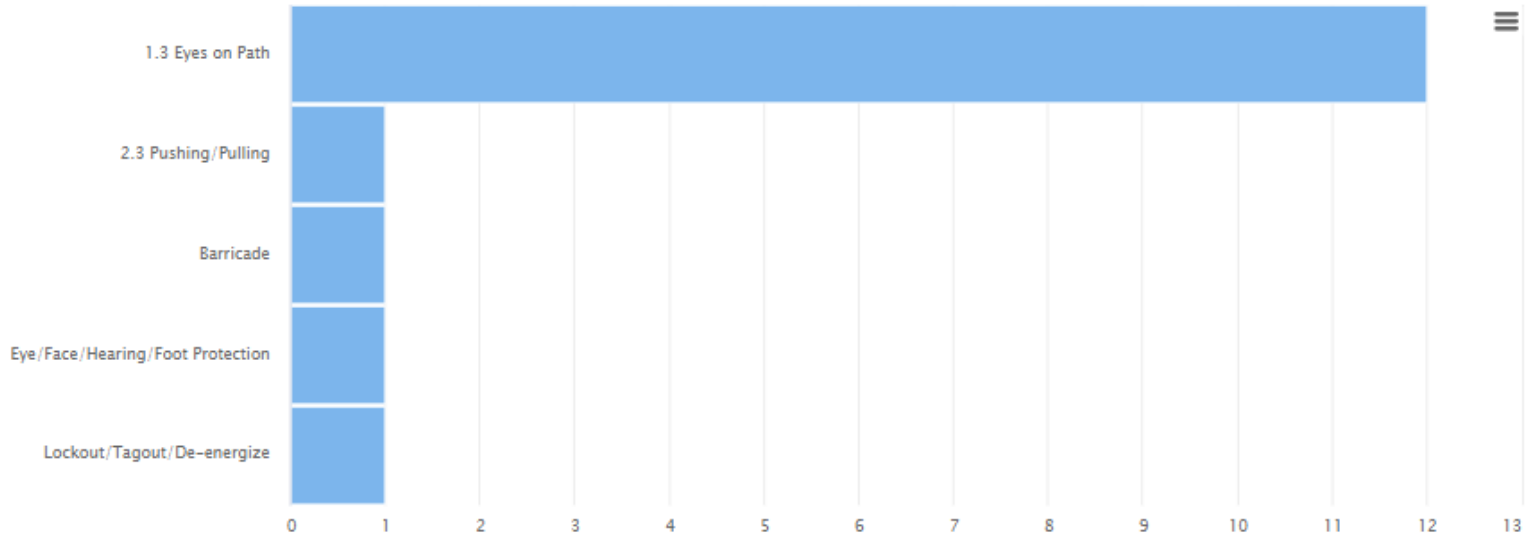


Feedback

Lindsey Johnson (28938)
— ★★★★★ *Great observation*

Lindsey Johnson (28938)
— ★★★★★ *Great observation. Well received and thought out.*
Driving Forklift

Top # Chart: At-Risk Exposures



Action Items

Earplugs
— Created By *Lindsey Johnson (28938)* at *Kansas City*
Open Medium Due 03-08-2019

Ladder Broken
— Created By *Lindsey Johnson (28938)* at *Kansas City*
Open High Due 03-19-2019

Action Item Created From Observation 906254
— Created By *Lindsey Johnson (28938)* at *Kansas City*
Open Low Due 05-07-2019

Action Item Created From Observation 906254
— Created By *Lindsey Johnson (28938)* at *Kansas City*
Open Low Due 05-07-2019

Action Item Created From Observation 906255
— Created By *Lindsey Johnson (28938)* at *Kansas City*
Open Low Due 05-07-2019

Action Item Created From Observation 906255
— Created By *Lindsey Johnson (28938)* at *Kansas City*

Observation Clean Sheets

Date Range

01/31/2019 - 12/31/2019

Search

Export to Excel | Export to PDF

Drag a column header and drop it here to group by that column

Observer	Default Location	Observation St...	Participation R...	% Safe	% At Risk	% Barrier	# Clean Sheets	% Clean Sheets...
KevinMcDaniel		0	1 %	100 %	0 %	0 %	2	100 %
AlbertGordon		0	0 %	100 %	0 %	0 %	1	100 %
HaroldTaylor		2.17	3 %	100 %	0 %	0 %	6	100 %
RoyWallace		5	0 %	100 %	0 %	0 %	1	100 %
SebastianBartels		0	0 %	100 %	0 %	0 %	1	100 %
StephenPrice		0	0 %	100 %	0 %	0 %	1	100 %
TBoyer	Kansas City	0	31 %	97 %	2 %	0 %	34	79 %
AnnaGomez		0	2 %	95 %	4 %	0 %	3	75 %

Clean Sheet Variance by Role

Role	Total Observations	% Participation	% Safe	% At Risk	Unique Exp/Obs	Safe/Obs	At Risk/Obs	% Clean Shee...	Ranking
Observer	1802	99.18 %	99.18 %	0.82 %	11.7	11.6	0.1	91.12 %	3.56
Steering Committee Member	120	98.21 %	98.21 %	1.79 %	12.1	11.88	0.22	80.83 %	3.57
Coach	146	97.1 %	97.1 %	2.9 %	9.93	9.64	0.29	75.34 %	3.77
Reviewer	85	95.75 %	95.75 %	4.25 %	8.59	8.22	0.36	68.24 %	3.95
Admin	40	90.65 %	90.65 %	9.35 %	6.15	5.58	0.57	50 %	3.8

Field of View

Are you suffering from blind spots?

Date Range

12/14/2020 - 06/14/2021

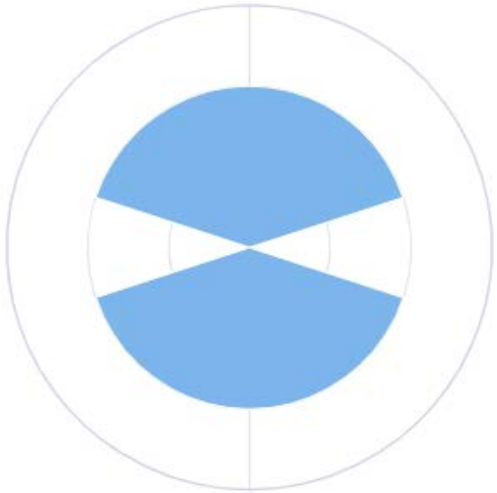
Exposures

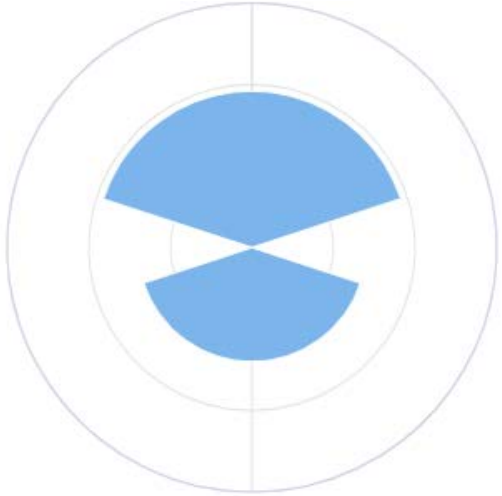
20 item(s) selected

Your Field Of View

Company Field Of View

Exposure Name	User # Observed	Company # Observed
1.1 Line of Fire	2	48
1.2 Pinch Point	2	35





- 20 exposures/critical controls available
- Only 2 being reported on in the last 6 months
- Individually AND within the company

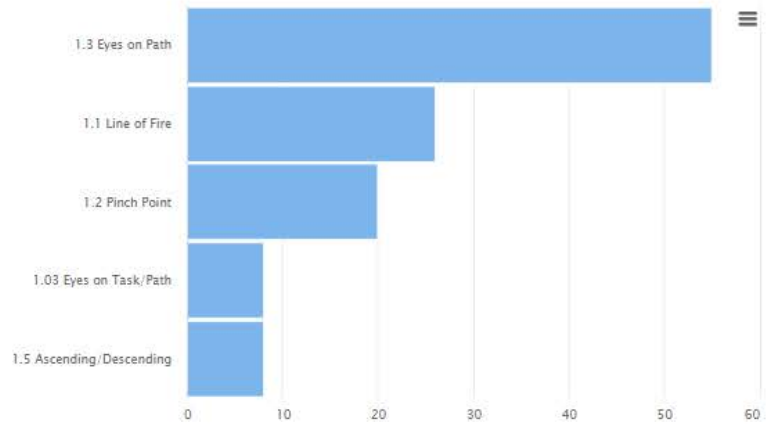
Data Silos Eliminated

My Dashboard | Company Dashboard

Review Rate	Coaching Rate	Observation Quality	% Safe
27%	20%	★★★★★	83%

Contact Rate	High Risk At Risks	Participation Rate	Total Observations
1.57	3	35%	236

At-Risk Exposures



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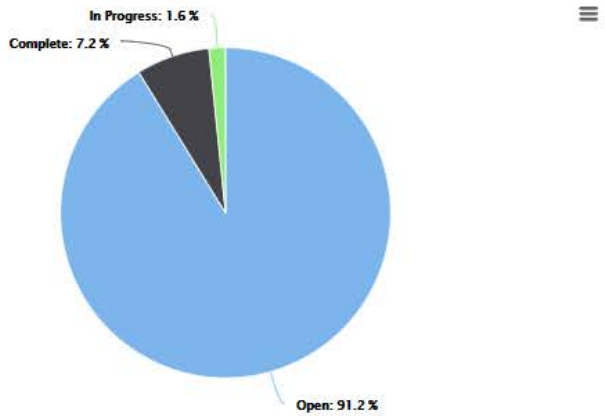

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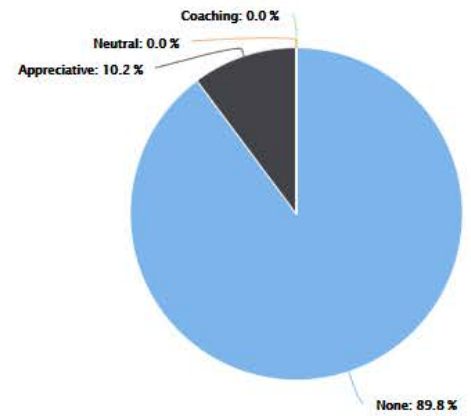

Science & Technology

Tying science to technology and having real time data to help you identify exposure can significantly improve your safety results.

Thank you! See us at our booth

Booth Number: 1512

Contact Information:

Corey Hopkins
corey.hopkins@dekra.com
712-363-6780

Lindsey Johnson
lindsey.johnson@dekra.com
816-897-3256

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Wifi Network: GEAPS2022 Password: Exchange92

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