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HOP to Success
in Manufacturing

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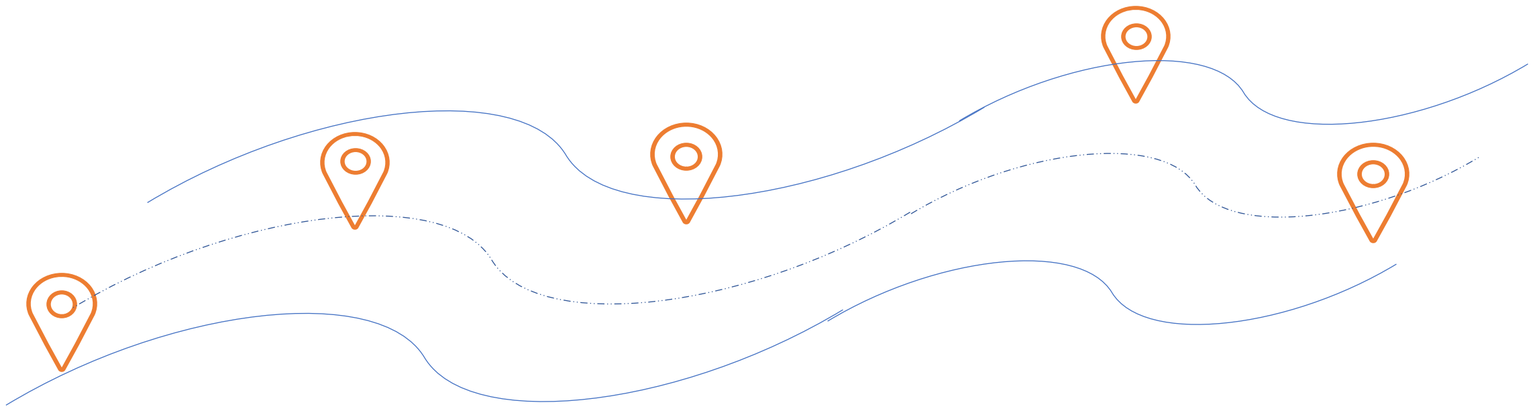
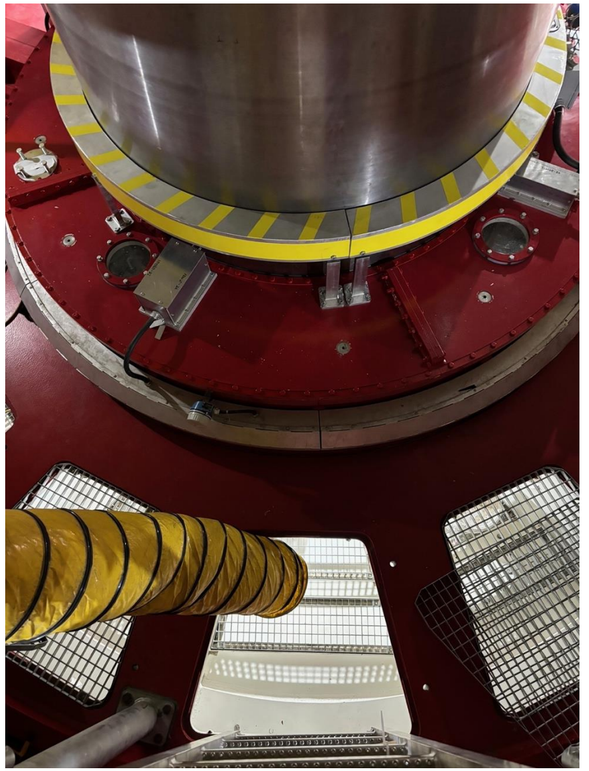
Learning Objectives

- _____
- HOP Introduction
- HOP Essentials
- A Roadmap
- HOP Resources

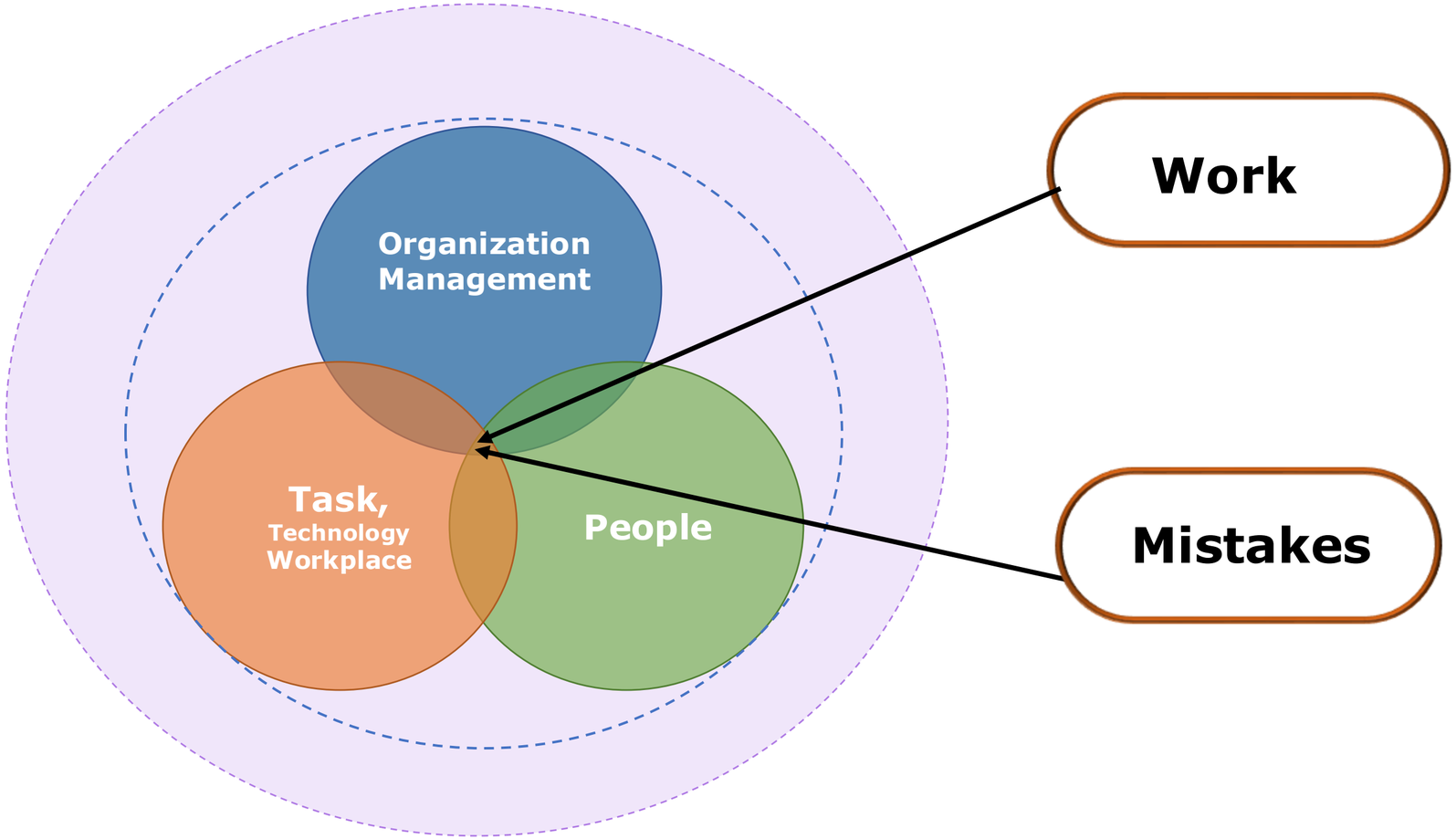


Exercise



HOP – Development

Human Factors/Ergonomics



Human and Organizational Performance (HOP) Principles

- Humans are Fallible
- Blames Solves Nothing
- Context Drives Actions and Decisions
- Leaders Response Matters
- Learning is Vital

Dr. Todd Conklin

Why HOP?

Perspective is SO IMPORTANT!

What you look for, is what you find

Regardless of the methodology you employ, if you're only looking for faulty parts you will find it.

Traditional Safety Management

Zero incidents, injuries, surprises.

- Focus on ZERO incidents
- Safety defined by absence of incidents
- Common responses not as effective as hoped

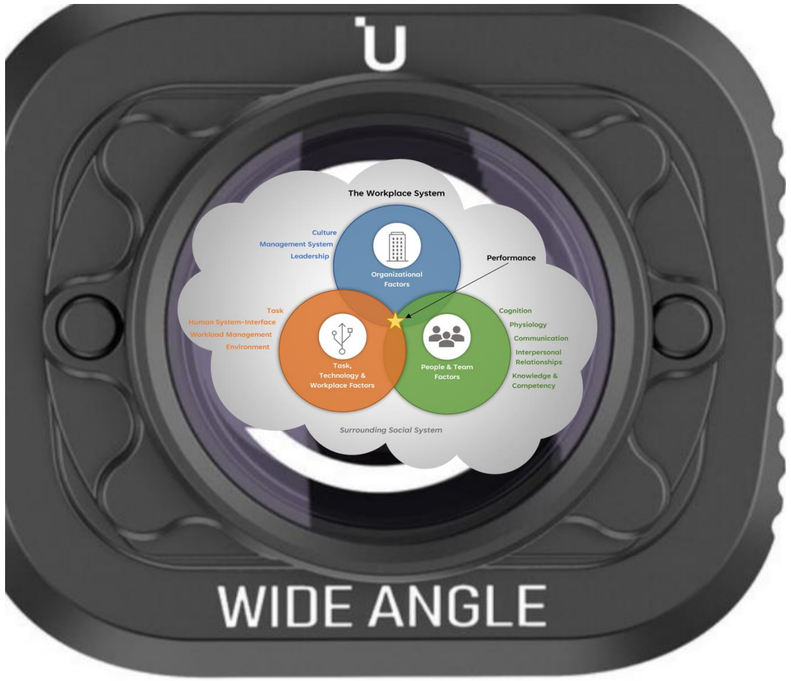
Erik Hollnagel, 2020 – safety i and safety ii

HOP is an OPERATING PHILOSOPHY

HOP provides a new lens for viewing work, people, organizational management and the systems in which people get work done.

HOP is not a program

Not the only solution



[CER – Systems Thinking: The Workplace System (cer-rec.gc.ca)]

Work is Performed in Context

- Visible parts?

4S

- Invisible parts?

Compliments: OSHA Health Hazards Workbook

Factors contributing to tower-crane misadventures

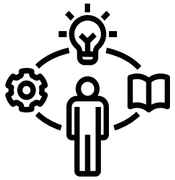
Applying HOP

Mistakes Happen

- Loads hitting high voltage lines

Blames Solves Nothing

- Operator, supervisor, rigger, comms coordinator, safety officer, owner



Context Matters

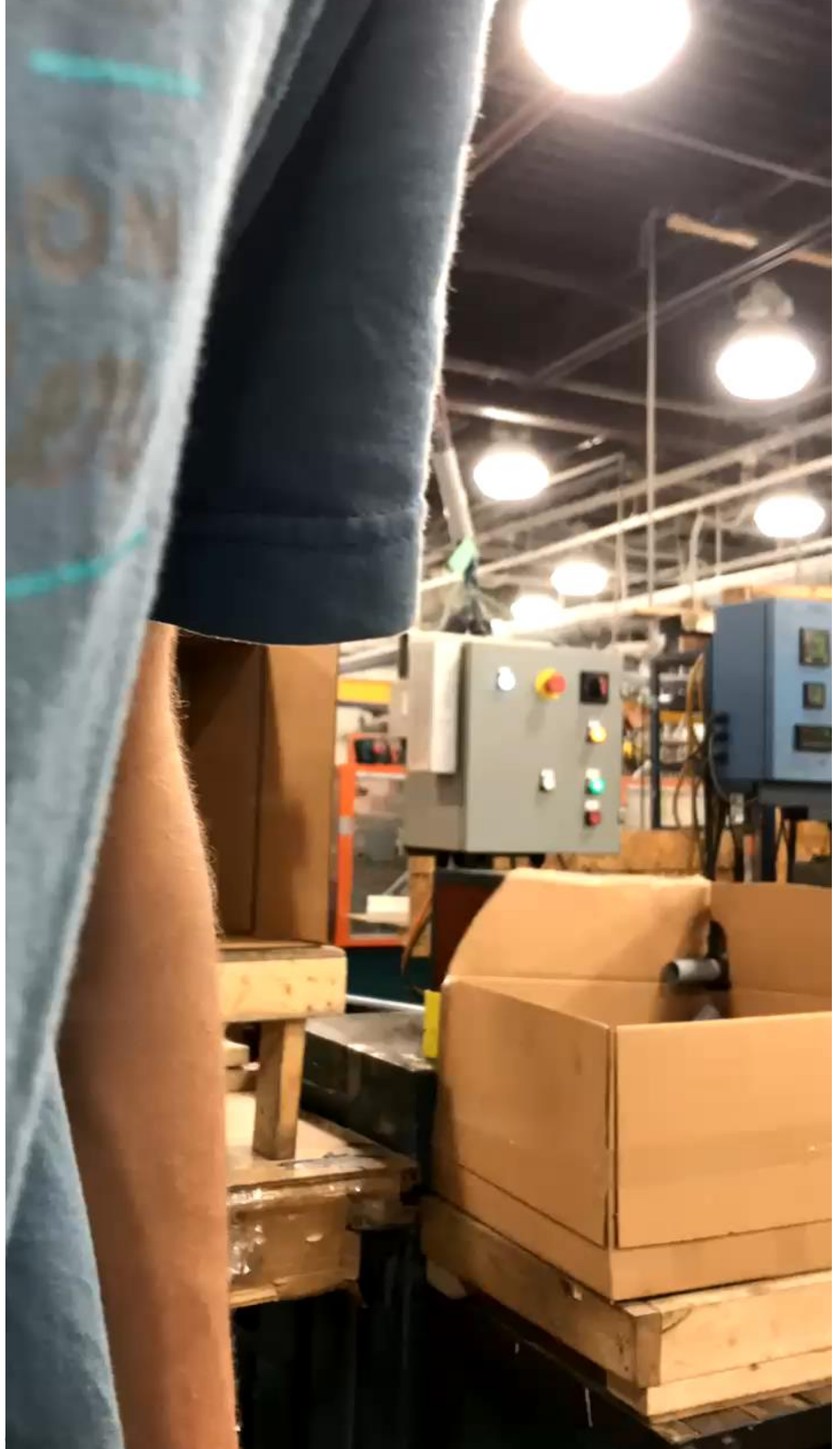
- Footprint, weather, load, practices, equipment, planning

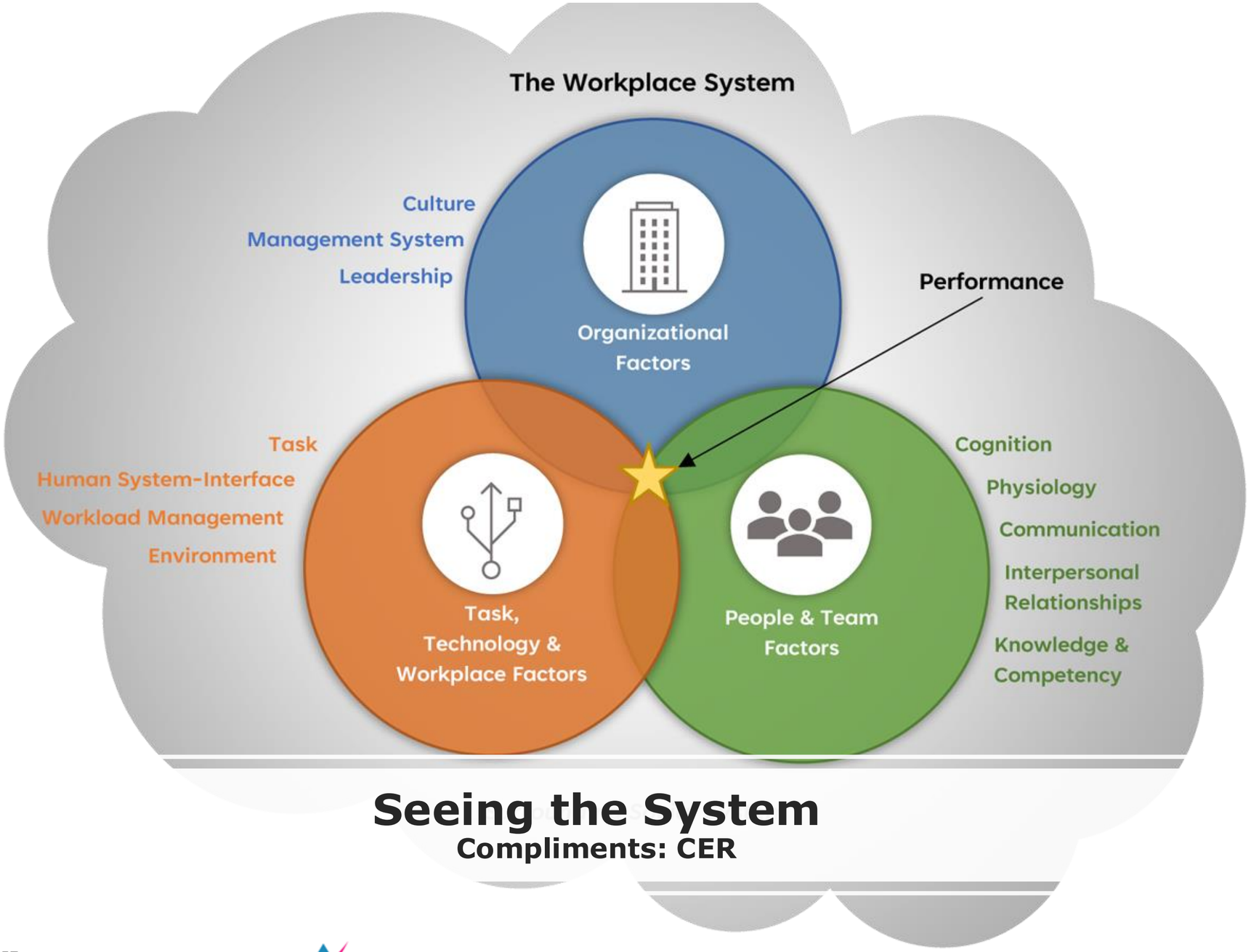
Leaders Response Matters

- Reactive? Responsive? Curious?

Learning is Vital

- Changes? Communication?





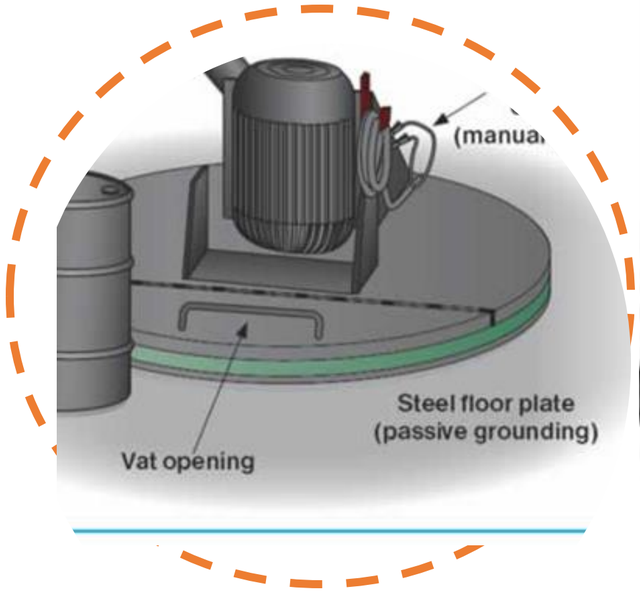
Seeing the System

Compliments: CER

HOP Principles

#1 Humans are Fallible

People make mistakes



Innovation Breakthroughs

Many successful products or technologies, originated from mistakes

How many times does the letter F appear in the following sentence?

Finished files are the result of years of scientific study combined with the experience of many years. Finished files are the result of years of scientific study combined with the experience of many years.

Mis-fueling

Why are 150,000 motorists per year (in the UK) putting the wrong gas in their vehicles?

(This error occurs every 3 minutes)

Because they can!

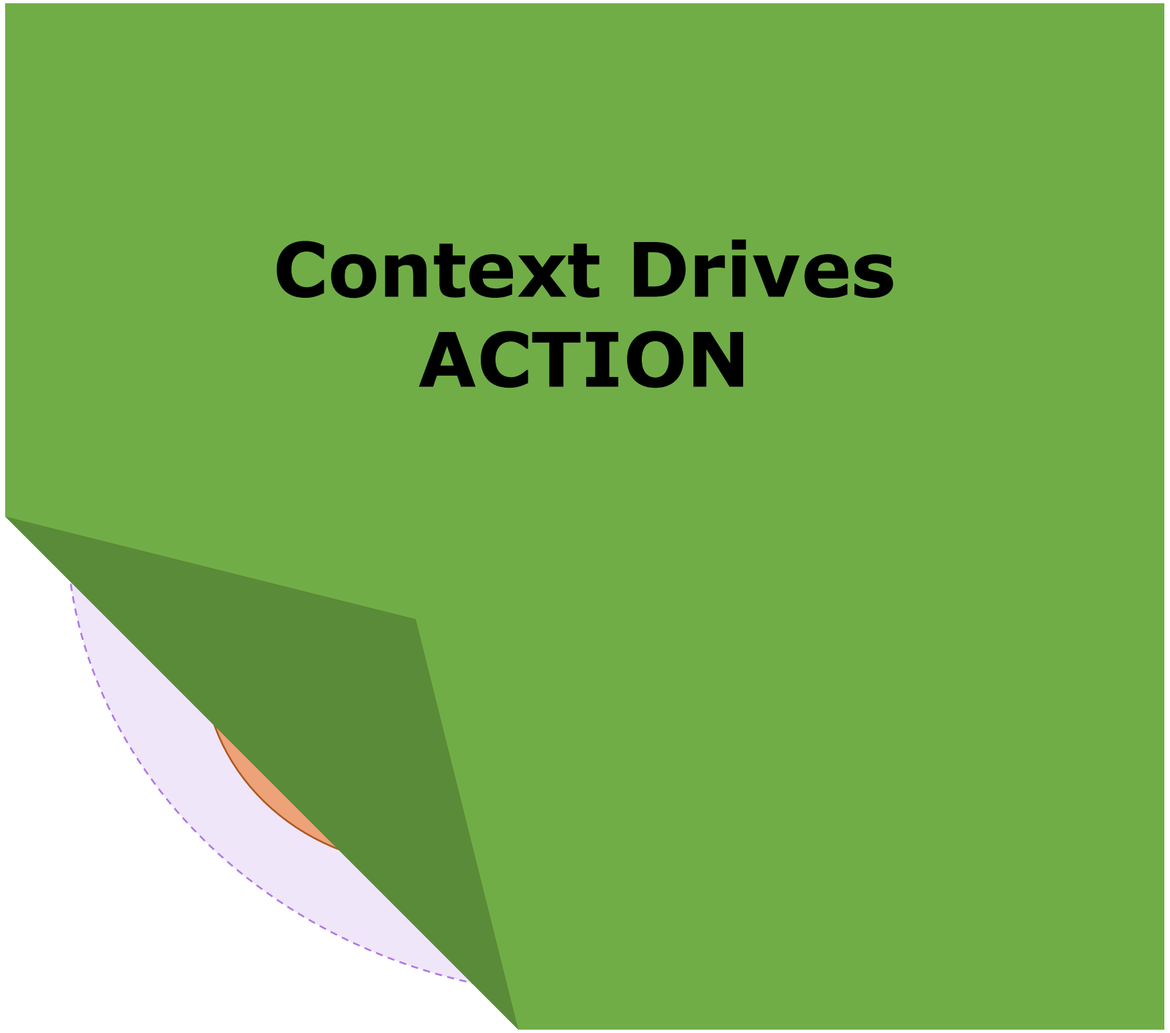

HWY 35
Speed limit 100 km/h
Stop sign with red flashing light
Truck was moving west on Highway 335
Wreckage
HWY 335
Concern trees may have obstructed visibility
Bus was moving north on Highway 35

#2 Blame Solves Nothing

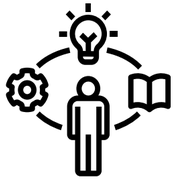
- When planting tomatoes, if they don’t grow well, leaves wither, or black spots appear on the leaves…we don’t blame the tomatoes.
- You look for the reasons why they’re not doing well. It may need fertilizer, less or more water, less sun…You don’t blame the tomatoes.

Case Study: HOPping From "Railings" to "Relationships"

Principle #3

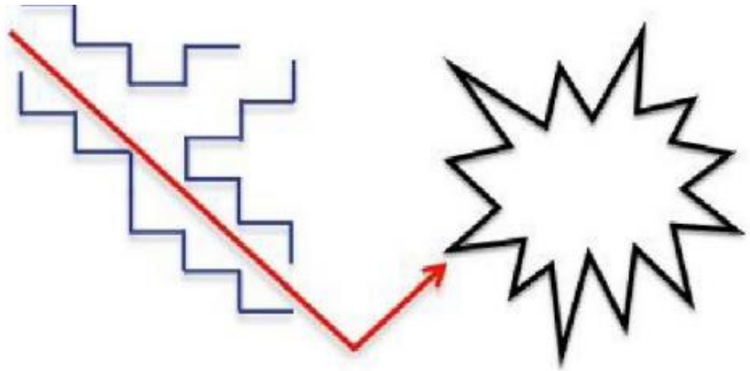


How did this happen?



- Incident cannot be understood without describing the context of how it took place
- By exploring **context**, we can begin to see and understand how the context influenced actions and decisions
- Time of day - 2-3 AM, WOCL
- Environment – dark, engines running
- Communication – radio signal ‘dropped’
- Task – triaging trucks for load pick-up – many waiting

Three Parts of Every Failure - which is more meaningful?



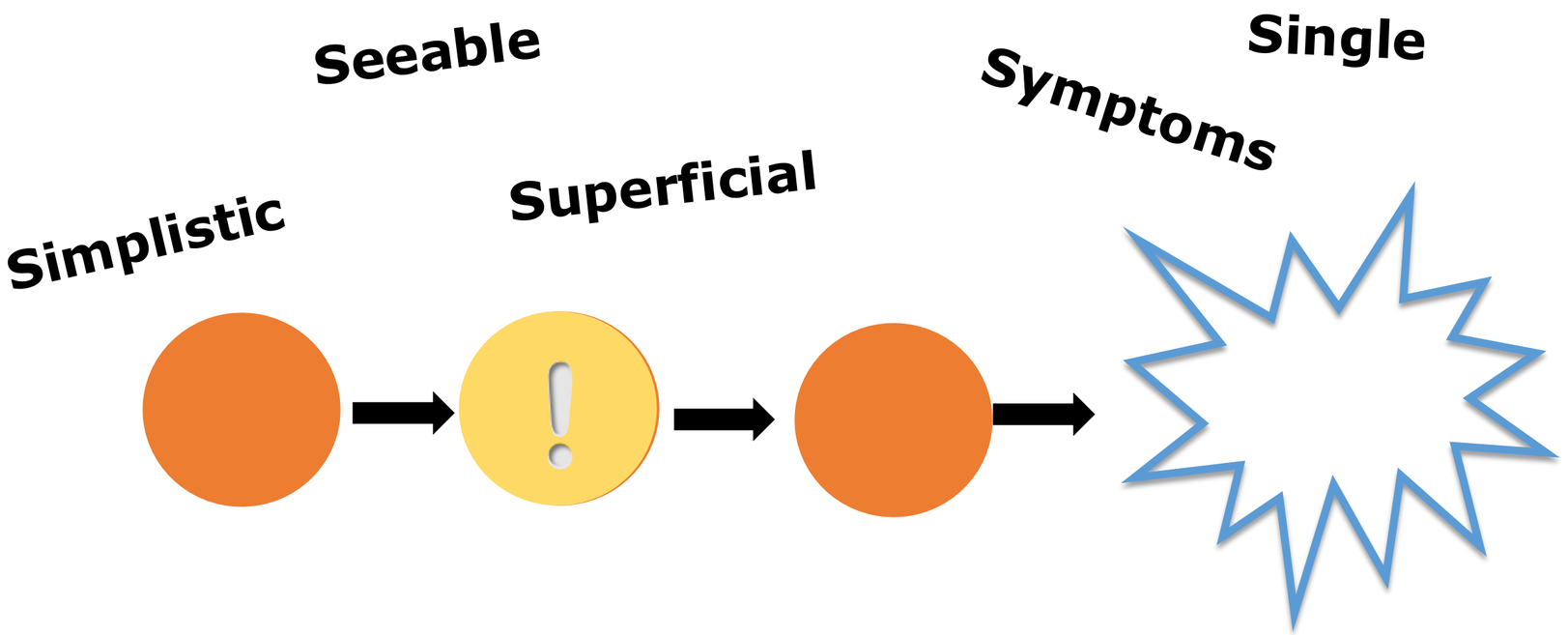
The Context
– Conditions leading up to the event
• Understand the influences on the work/worker at the time

The Consequence
– The undesired outcome • Near miss or catastrophic

The Retrospect
– Looking at the event, after the event

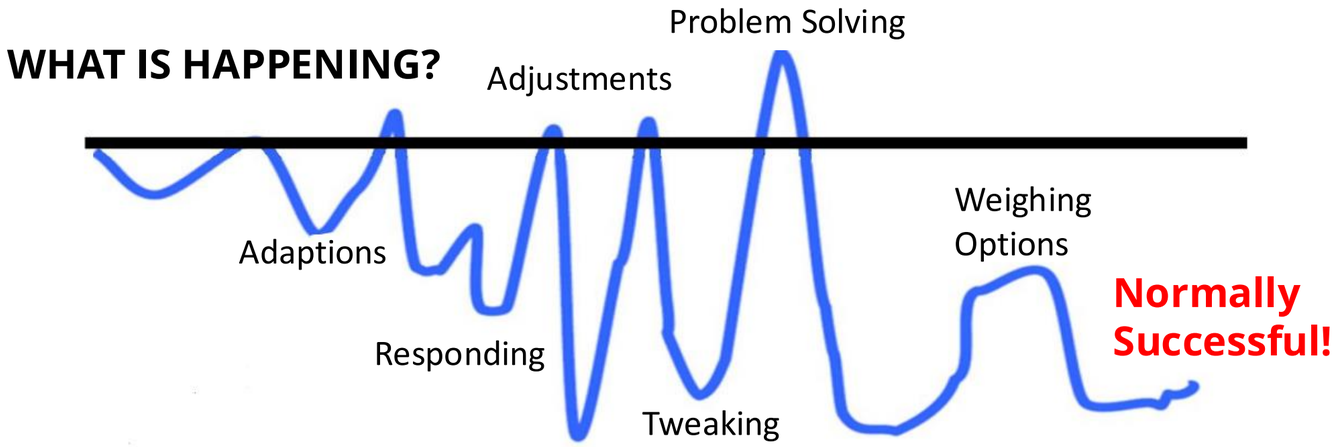
• Often contains hindsight bias, eg. “Worker *should* not have stood there”

Blinded By the Light…

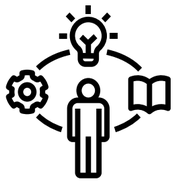


…To Systemic

The Black Line "Work as Imagined"
The Blue Line "Work as Done"



Rules Have Value and Limitations



- Help shape practices
- New worker guidance
- Standardize work activities (where possible)

But also…

- Can’t cover *all* situations
- Can’t predict what *may* happen
- Can’t *alone* create safety
- Can’t cater to *all* levels of expertise and experience
- Static, work is dynamic hence maybe incompatible
- Often idyllic

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Software

Task requirements
Job, traffic plan/s
Schedules
Near misses
Reporting procedures
Work Procedures
Risk assessment
Training
Orientation
Manuals

Hardware

Mixed vehicle traffic
Vehicle movement
Mirrors, alarms, lights
Driver feedback, cameras
Attachments, blind spots
Warning devices
Materials, Loads, GPS
Phones, computers
radios

Liveware

Line of sight
Expectations
Vision, position
Posture
hearing

Environment

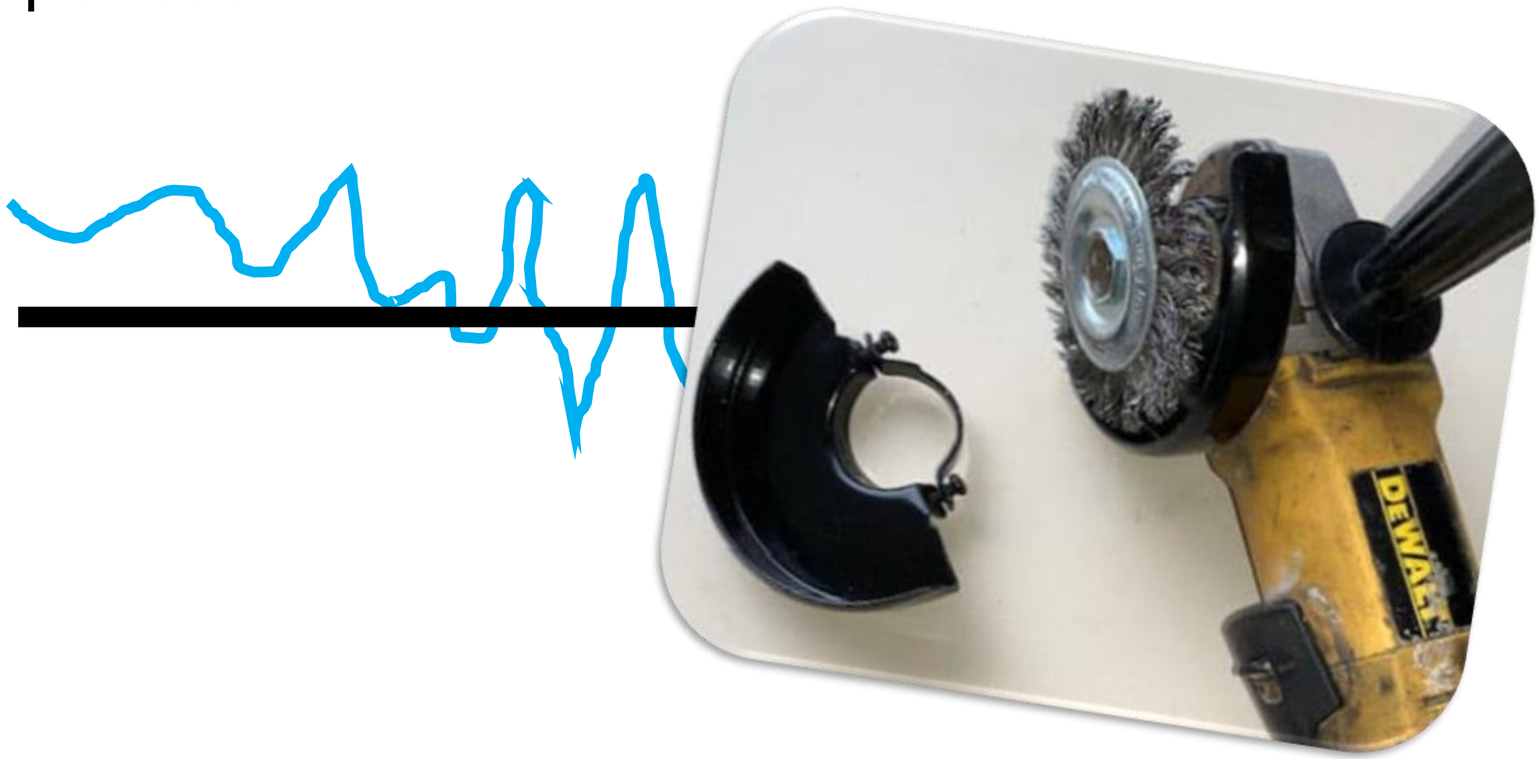
Pedestrian areas, paths
Site layout, congestion
Blind corners, time of day
Incentives, noise
Entrance and exit locations

Liveware

Communication
Coordination
Deliveries
Sub-contractors
Signalers

Exercise

How would you approach this to determine what happened?



Common Scenario

Generally, interviews begin open-ended saying or asking, "**Can you please tell me what happened?"**

Often after **a few seconds**, the witness's narrative is interrupted with :

Were you trained?
Were you tired?
Were you on your phone?
What did you eat?

Were you Supervised?
Were you following the Procedures?

Question-less Interview

Goal: to conduct an interview without asking questions

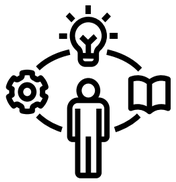
- Using TED – **T**ell, **E**xplain, **D**escribe your story.
- Gain information when witness is speaking, not when interviewer speaks.

Understand Work-As-Done

People do things that make sense to them given their goals, understanding of the situation and focus of attention at that time

Those who do the work know the work best

Local Rationality

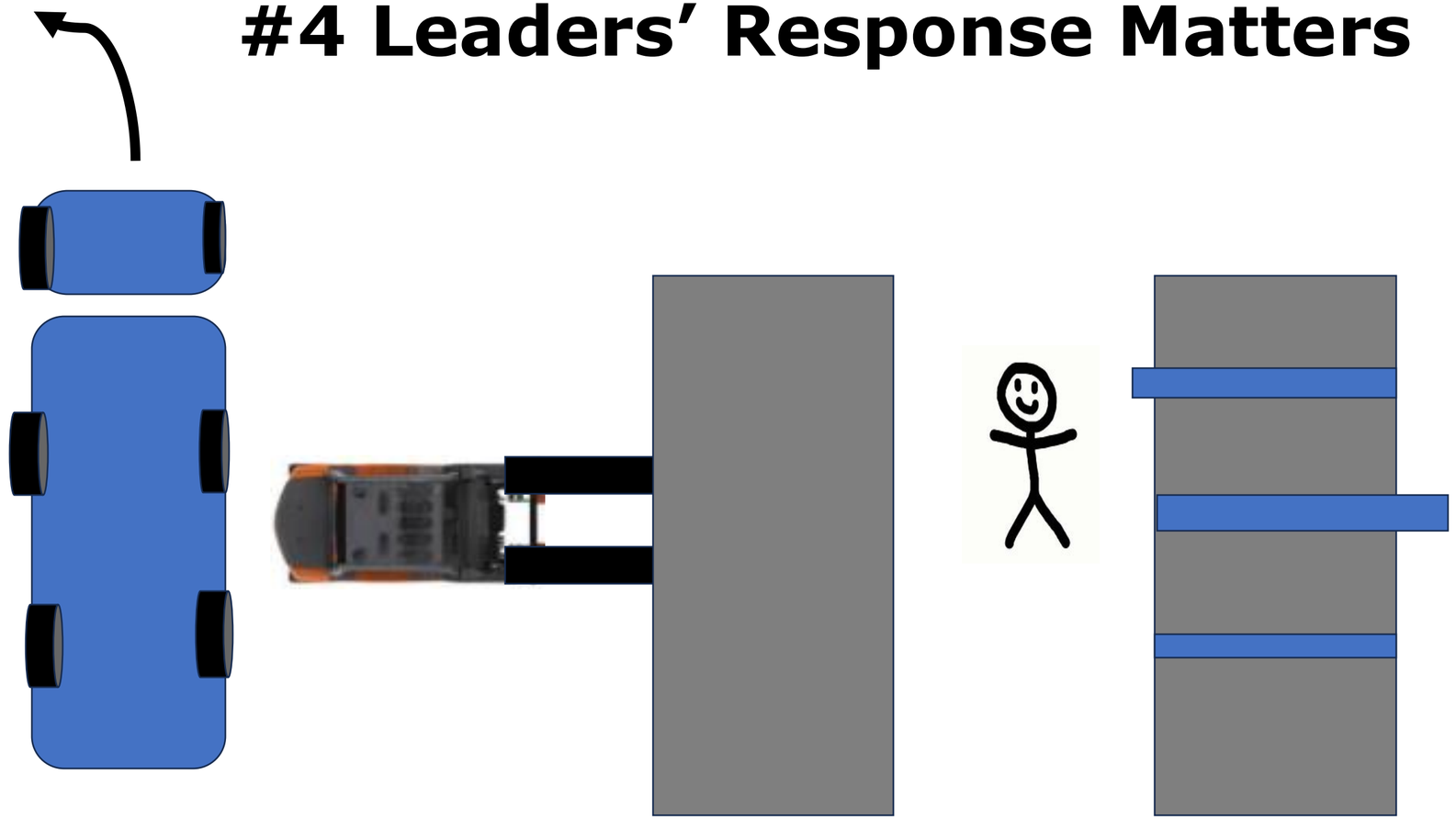


Workers don’t intend to create harmful outcomes – they do reasonable things given their knowledge, objectives, point of view, focus of attention and resources. They fulfill the objectives of the organization they work for.

Workers take actions that make sense. They believe their actions are safe.

How is it that that action seemed reasonable, rational to that person, at that time?

#4 Leaders' Response Matters



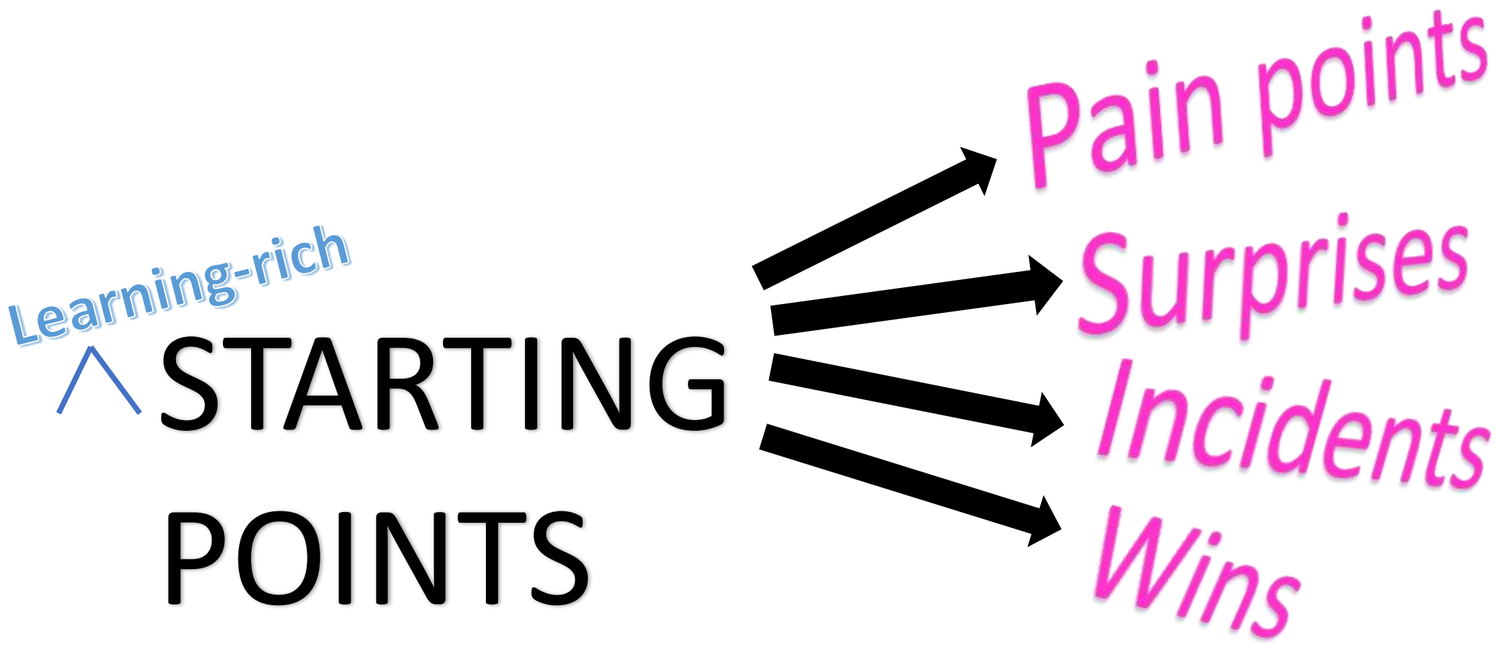
#5 Learning is Vital

- Fixing is not learning
- Start by asking better questions

With increasing complexity in work and the world, surprises, incidents and near-misses can provide valuable insights

Learning is Vital

EXERCISE


Learning-rich
STARTING POINTS
Pain points
Surprises
Incidents
Wins

Common Controls

- Awareness campaigns
- Warning signs
- Personal Protective Equipment
- Training
- Tailboard meetings
- Procedures

HOP Integrated

- Investigation Teams adopting HOP
- HOP lens applied to audits
- HOP principles training in various industries
- Learning Teams & Learning Efforts by companies applying HOP
- Collaboration with agencies across the globe
- The mining industry is currently primed to take innovative steps towards improving outcomes as it relates to the health and safety of workers in the workplace
- Lens not a program
- Timing, pace and support




MSI Risk and Role of HOP

Musculoskeletal Injury (MSI) Prevention
Toolbox Talk/Meeting Guide

MATERIAL HANDLING

Awkward postures and over-reaching can increase MSI risk

A musculoskeletal injury (MSI) is an injury or disorder of the muscles, tendons, ligaments, joints, nerves, blood vessels or related soft tissue, including a sprain, strain, and inflammation, which may be caused or aggravated by work. MSIs can include sprains and strains, tennis elbow, bursitis, etc.

Why is it important? On average, MSI claims are 34% of all WorkSafeBC claims. From 2011 to 2020, that was an average of 17,891 claims per year. MSI is the leading cause of injury.

Characteristics of MSI

An MSI may be an acute injury – for example, you lift something and feel immediate pain. An MSI could also be a chronic injury, such as an injury that takes time to develop (carpal tunnel syndrome). With an MSI, there may be signs and symptoms. You can observe signs like swelling, redness, or difficulty moving a body part. Symptoms are what can be felt but not observed. Symptoms could include numbness, tingling, or pain. Recognize signs and symptoms and seek early intervention before they become disabling injuries.

Risk Factors

The physical risk factors for MSI are the physical demands of a task including:

- Force (lifting, lowering, carrying, pushing, pulling, and grip)
- Repetition
- Awkward and static postures
- Local contact stress
- The duration and magnitude of your exposure can contribute to an MSI.

Next steps

- Educate workers about risk factors, signs and symptoms of injury, and potential health effects.
- Identify jobs that put workers at risk for developing an MSI.
- Complete risk assessments for jobs that place workers at risk for developing MSI.
- Implement control measures to limit worker risk of developing MSIs.
- Train workers in the risk control measures.

Record of Workers who attended

Name _____ Initial _____
Name _____ Initial _____

Safety Conversations: Ask, Explore, Learn
MATERIAL HANDLING

Understanding how people, processes, and environment influence manual materials h

Objective: Let's talk about manual material handling - moving, lifting, lowering, pushing, p carrying materials manually. Let's explore your work, experiences, challenges, opportunitie to understand, learn and improve.

Understanding The Work

Questions:

What does a typical day look like for you in terms of manual material handling?
What do you find particularly helpful, challenging or annoying?
What items need to be handled most often?

Employee feedback/safety issues/questions/recommendations

_____
_____
_____
_____
_____

Material Handing Factors

Common factors that influence material handling tasks can include:

- **Heavy or awkward loads** – Size and shape of objects
- **Repetition** - Frequent handling without opportunity for recovery
- **Workspace layout** – how your work area is arranged influences posture and how work is as reaching forward, up or below knee height
- **Environment** – areas that are cluttered, cramped, slippery – or floors with thresholds, ste corners, very warm or cold temperatures can also influence

Discussion

- "Which of these risk factors do you encounter in your work? Please describe or explain the scenario.

Employee feedback/safety issues/questions/recommendations

_____
_____
_____

Suggestions, strategies & support

Ideas: "Your feedback is valuable. What changes or support do you think would improve mater handling on your task, area or at this worksite? Please feel free to share.

_____
_____
_____
_____

Discussion Points (Facilitator Notes)

Signs to pay attention to are reduced movement, redness or swelling - things we can see.
Symptoms you may have a strained a muscle are pain, discomfort and tingling – things we can

Discussion

If you are experiencing signs or symptoms, please tell your supervisor. Is there better ways to s reporting? Any questions?

_____
_____

Who attended

Name/Initial _____ Name/Initial _____
Name/Initial _____ Name/Initial _____
Name/Initial _____ Name/Initial _____
Name/Initial _____ Name/Initial _____

Name of Facilitator _____ Date _____
Supervisor Signature _____ Date _____

HOP-Inspired Safety Inspections

This inspection guide encourages the adoption of a perspective that transforms what we see and ask about during a workplace inspection. Using open-ended questions can lead to better observations but also helps understand the work being done! After pinpointing areas or processes to inspect, consider using these questions to spark conversations, gather feedback and uncover valuable insights from those who know the work best.

Asking Quality Questions: Enhancing Inspections with Curiosity

Can you walk me through your typical day and the work you do? What am I looking at?

What is your biggest risk?

What can go wrong? What do you need to manage, oversee or do?

What's your experience, successes or challenges or annoyance/s with this work/task?

What practices or procedures work well?

Are there procedures or instruction that need to be developed, removed, updated or changed to be easier to use that would be helpful?

Have you noticed any changes in your work area?

Do you feel supported to share safety information – hazards, 'wins' close calls? Can it be improved?

Suggestions for changing/improving the work? Is there something that could make the work easier, more efficient and safer?

What would make it easier for you to share ideas or feedback about work, ideas you have or safety suggestions?

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[WorkSafe Magazine - Fall 2023 | WorkSafeBC]

- What’s STCKY today?
- What are we doing about the STCKY?
- What else needs to be done?
- 6 areas:
- Driving, steep-slope, pipe-handling, mobile equip interface (MEI) cargo mngt and pipe/load securement

Courtesy www.cat.com

Human and Organizational Performance at Caterpillar

More Ways to Integrate HOP

- Shift your language (e.g. context, learning vs. ~~complacency, Vision Zero~~)
- WAI (rules) vs. WAD (reality)
- Asking better questions: 4Ds, STICKY, STcH
- WYLFIWYF

HOP Principle Implementation

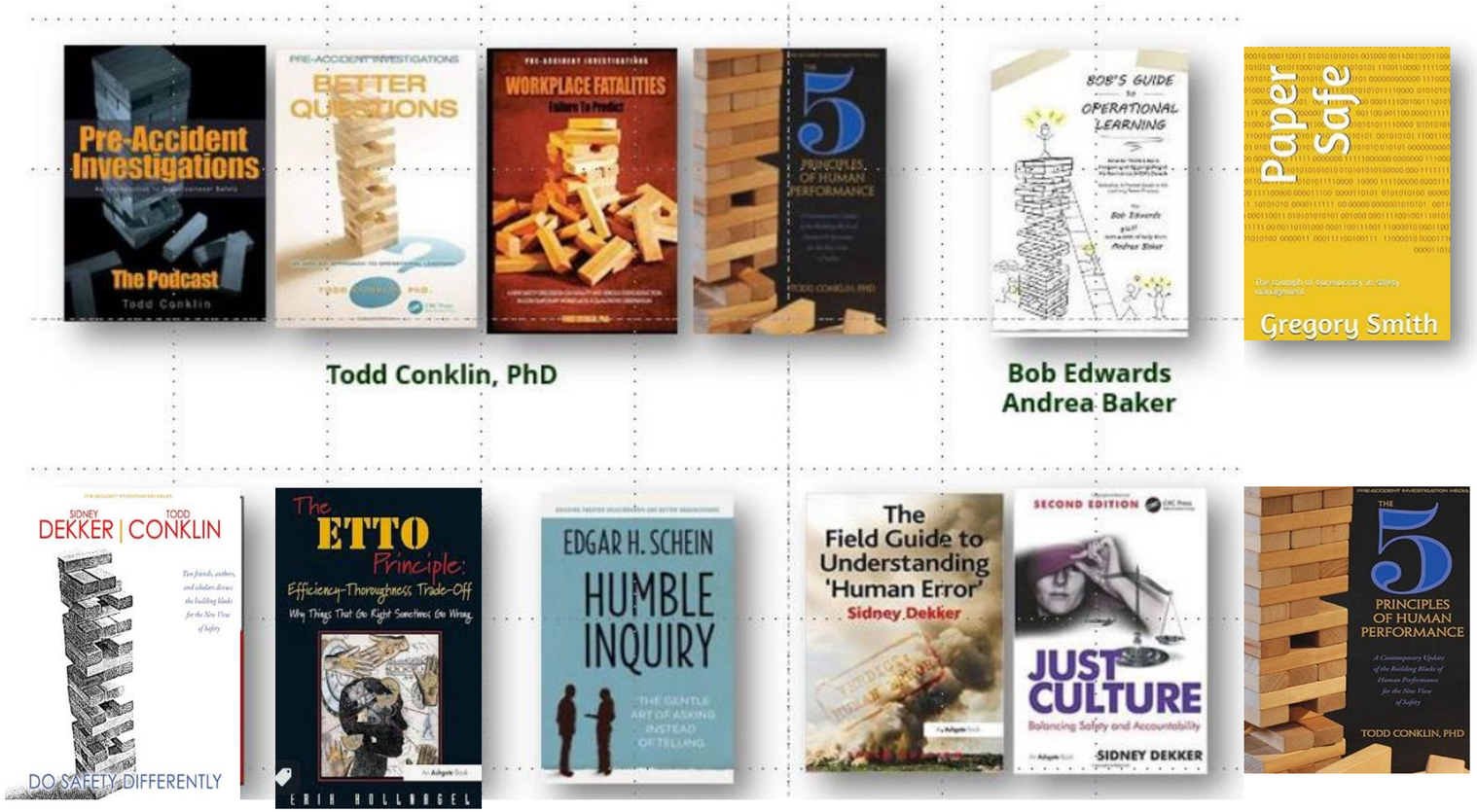
- **Select a HOP Principle:** e.g., Mistakes happen; people are fallible - Summarize the principle in your own words and explain its significance.
- **JHSC:**
  Briefly describe how your workplace currently addresses this principle. What practices are in place? Where are the gaps?
- Define specific goals you want to achieve by implementing this principle. What do you hope to see?
- List individuals or teams who need to be involved, such as supervisors, team members, or safety officers.

Possible Take Aways

- Understand (expected) human fallibility.
- Context is key; drives actions & decisions.
- Explore the system of work – learn about normal work.
- Collaboration and engagement with all employees.
- Procedures good but no guarantee.
- Foster open communication.
- Create space for learning.


Q
A

References


Pre-Accident Investigations
The Podcast
Todd Conklin
PRE-ACCIDENT INVESTIGATIONS
BETTER QUESTIONS
WORKPLACE FATALITIES
Failure To Predict
5
PRINCIPLES OF HUMAN PERFORMANCE
Todd Conklin, PhD
BOB'S GUIDE to OPERATIONAL LEARNING
Bob Edwards
Andrea Baker
Paper Safe
Gregory Smith
SIDNEY DEKKER | TODD CONKLIN
DO SAFETY DIFFERENTLY
The ETTO Principle:
Efficiency-Thoroughness Trade-Off
Why Things That Go Right Sometimes Go Wrong
EDGAR H. SCHEIN
HUMBLE INQUIRY
THE GENTLE ART OF ASKING INSTEAD OF TELLING
The Field Guide to Understanding 'Human Error'
Sidney Dekker
SECOND EDITION
JUST CULTURE
Balancing Safety and Accountability
SIDNEY DEKKER
THE 5
PRINCIPLES OF HUMAN PERFORMANCE
TODD CONKLIN, PHD

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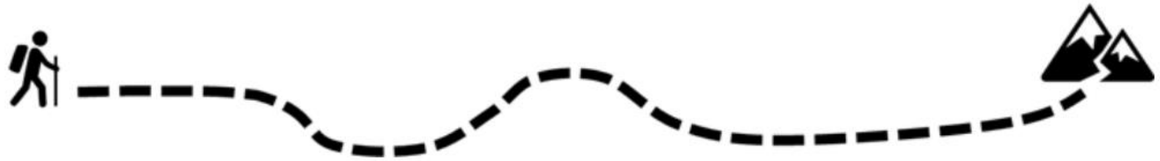
- STEW Cards Online Version (feb20).pdf
- Nutshell (safetysynthesis.com)

Need Help with HOP?



- “HOP Connections” – a free, monthly ZOOM call – last Wednesday of each month, 12-1:15. It’s a forum to ask questions, learn tools to innovate your safety, stay connected to others integrating HOP and hear from experts.
- HOP Resources for Inspections
- HOP toolbox talks
- HF Investigation Workshop, Oct 15th, Calgary
- HOP Webinar Series 2025

Thank you!

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