AGC 2020 CONVENTION The Construction Association

# PREPARING FOR THE INDUSTRY OF TOMORROW

## Human Performance: Understanding Human Error

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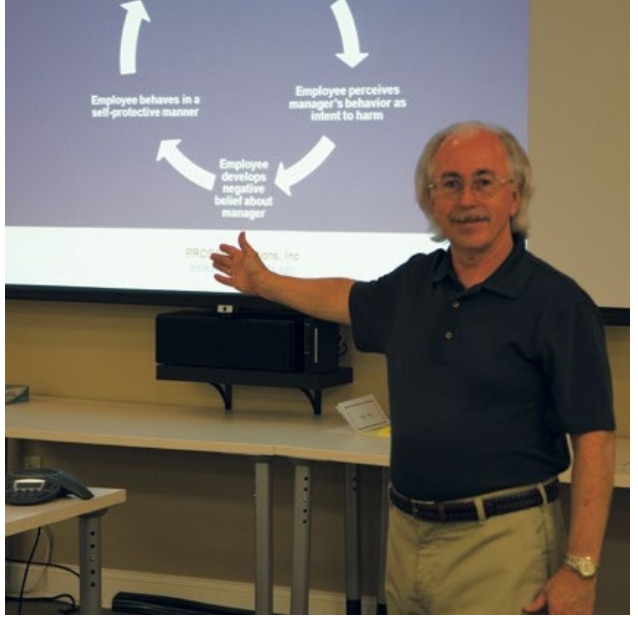



PROSAFE SOLUTIONS

# Earn CEUs For This Session

Participants must:

1. Check in with attendance scanner at the door or in the back of the room.
2. Attend at least 95% of the session.
3. Complete the session and post-program evaluation.
4. Complete a brief assessment with a score of 75% or greater.


**0.1 IACET CEU** | The Associated General Contractors of America (AGC) has been accredited as an Accredited Provider by The International Association for Continuing Education and Training (IACET). In obtaining this accreditation, AGC has demonstrated that it complies with the ANSI/IACET Standard which is recognized internationally as a standard of good practice. As a result of their Accredited Provider status, AGC is authorized to offer IACET CEUs for its programs that qualify under the ANSI/IACET Standard.

Additional instructions will be emailed to attendees requesting CEU credits.

# Learning Objectives

By the end of this session, participants will be able to:

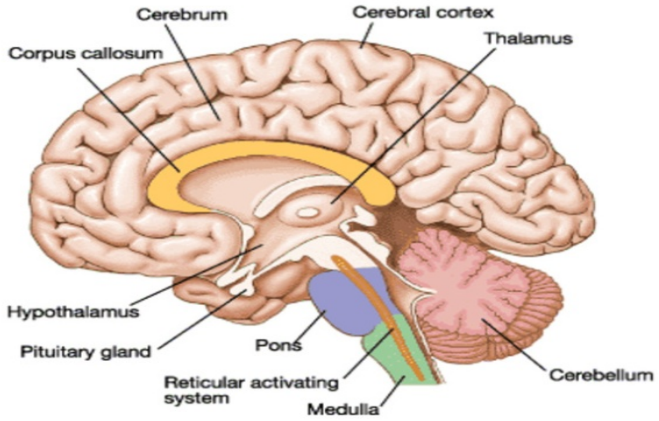
1. Gain awareness and understanding of Human Performance as an operating philosophy
2. Understand how "brain-centered hazards" are equally important to physical hazards
3. Learn how worker behaviors happen within the context of the work
4. Take away three practical error-reduction tools that can be used immediately

# Human Performance: Understanding Human Error

A brief introduction to the “NEW VIEW”

# What is HP?

The science of understanding human capabilities & limitations that have an impact on operations and safety




Methodology for improving processes, by understanding human error/behavior and the underlying organizational influences

# Not Some New Program!

- HP is an **operating philosophy**
  - The “New View”
  - “Safety differently”
  - “Systems-thinking”

- Integrates human & organizational factors that are usually overlooked in traditional practice

- Does not stop at symptoms
  - Unsafe acts & conditions

# Where Did HP Come From?


# Why Is HP Important?

- Organizations with sophisticated safety programs are still getting people hurt. Results have flat lined.

- Mostly due to not understanding and managing human factors.

Living Ground Hog day over & over again

# Operational Excellence

- HP is not just about safety.

- Can be used for improving all areas of performance.



*Forward-thinking organizations are using HP as a natural evolution towards learning and continuous improvement*

# $$$ - Cost of Errors - $$$

- How much money do you believe errors cost your organization?
- Railcars
- Estimators

# Cost of Errors

- Misunderstanding of human error at a company with 100,000 employees, averages $62.4 million per year in direct costs alone

- Indirect costs are much higher

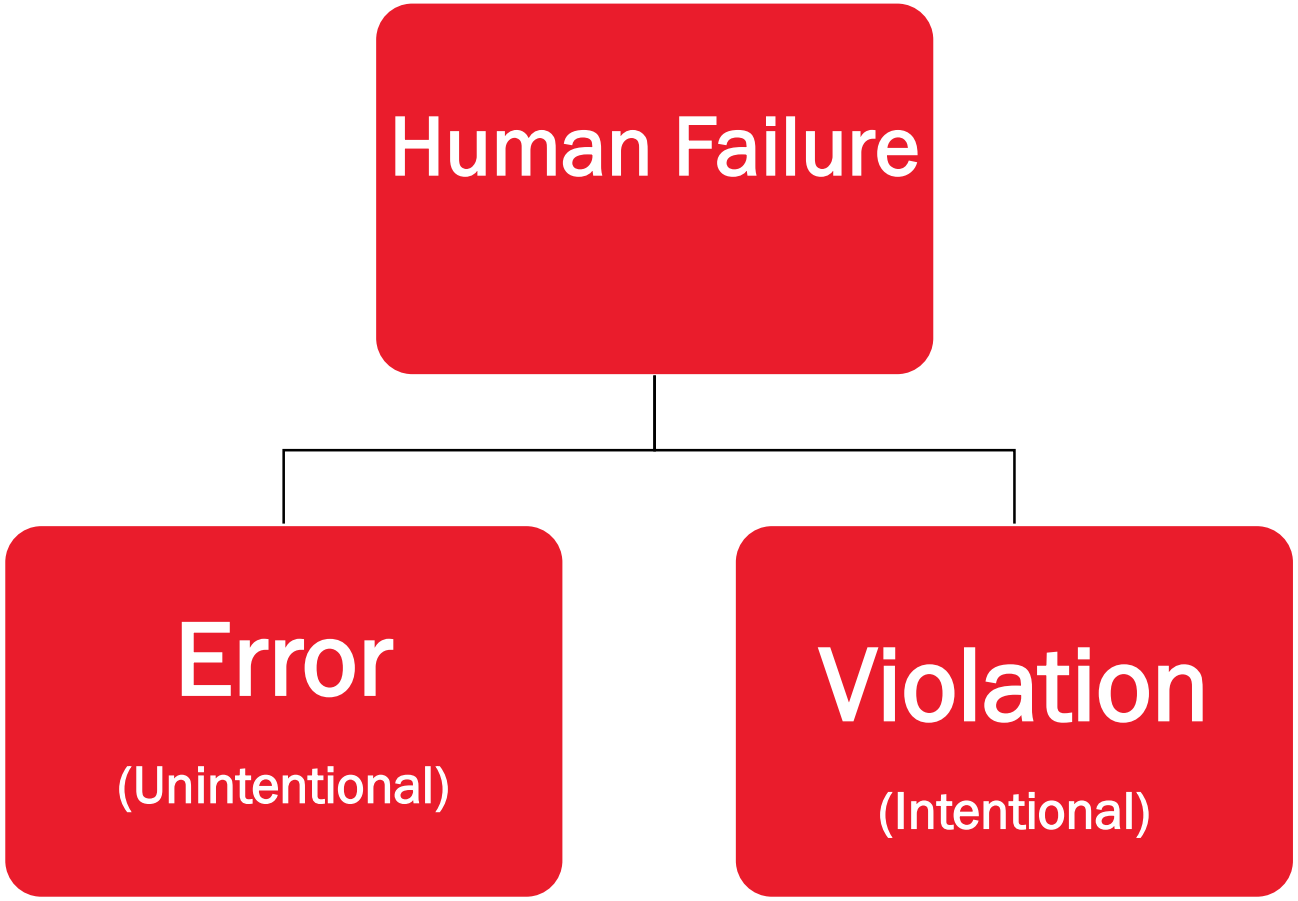
- Error is responsible for 60%-80% of failures, accidents and incidents in most high-risk industries.



*Source: The War on Error – Risk Management Magazine 2013*

# Human Performance Principles

1. People are fallible and even the best make mistakes
2. Error-likely situations are predictable
3. Organizations and people drift
4. Individual behaviors are influenced by culture and leadership
5. Events can be avoided by learning
6. People achieve high levels of performance based encouragement and reinforcement.




Both are failures and are usually system-induced

# What Is Human Error?

An unexpected deviation from an expected outcome.

***(not intended)***


"Great, Alan. That is just wonderful. You push the wrong button and now, instead of our fans enjoying a fireworks display, we've got an international incident on our hands."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# Brain-Centered Hazards

- Most workers have been taught hazard identification
- However, some hazards are centered in the brain
- Most organizations don’t account for these
  - Usually blamed on “human error”

# Fast Brain vs. Slow Brain

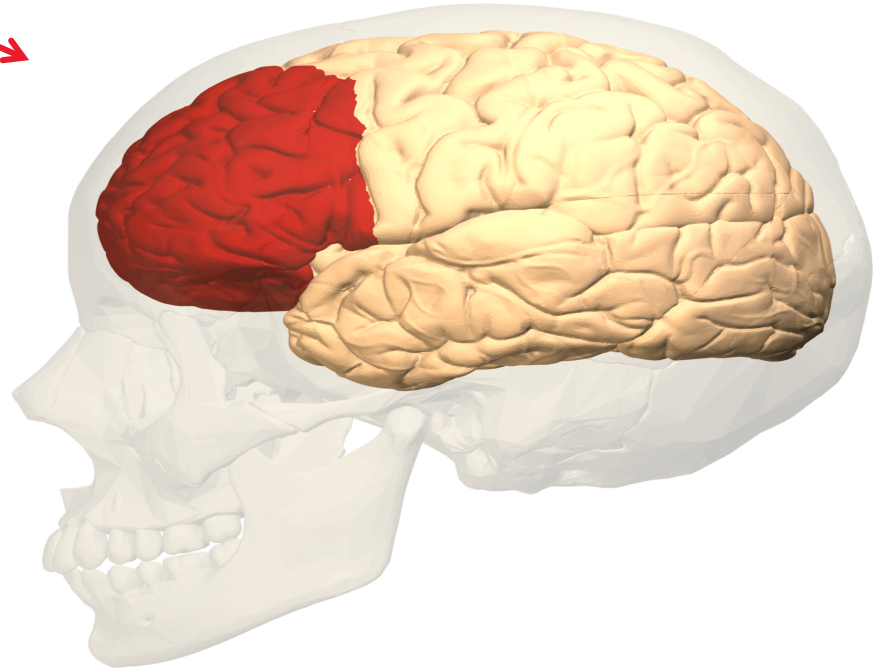
Pre-Frontal Cortex

"Slow brain"

*Conscious*

Where conscious thinking, focusing & logical analysis takes place

Gets quickly overloaded



Limbic

"Fast brain"

*Unconscious*

Produces automatic, pre-conscious, reactive, habitual, and emotion-based actions.



*The "fast brain" is in charge*

# Brain Limitations

Inattentional blindness

Change blindness

Time distortion

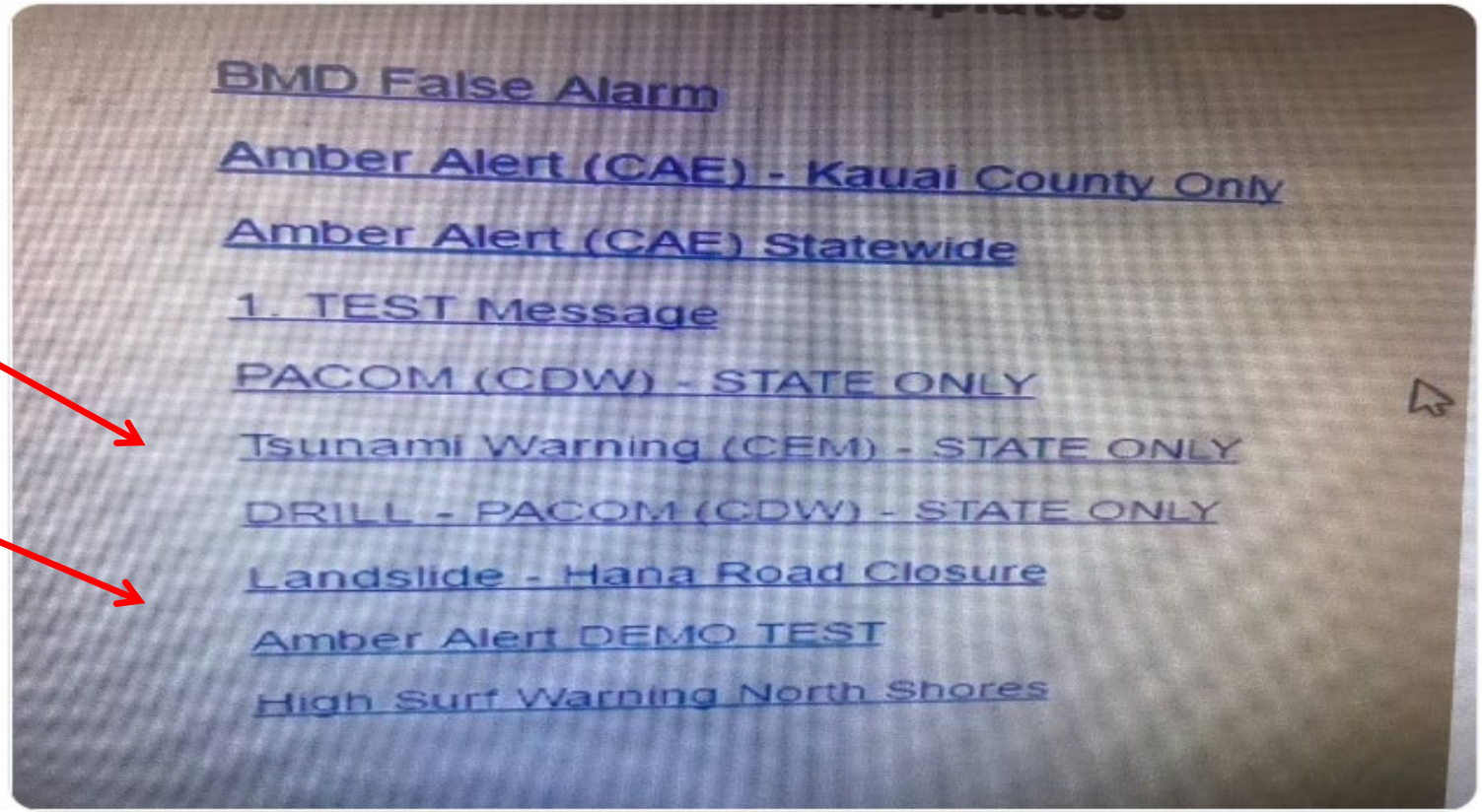
Inattentional deafness

Cognitive fixation

Mode awareness

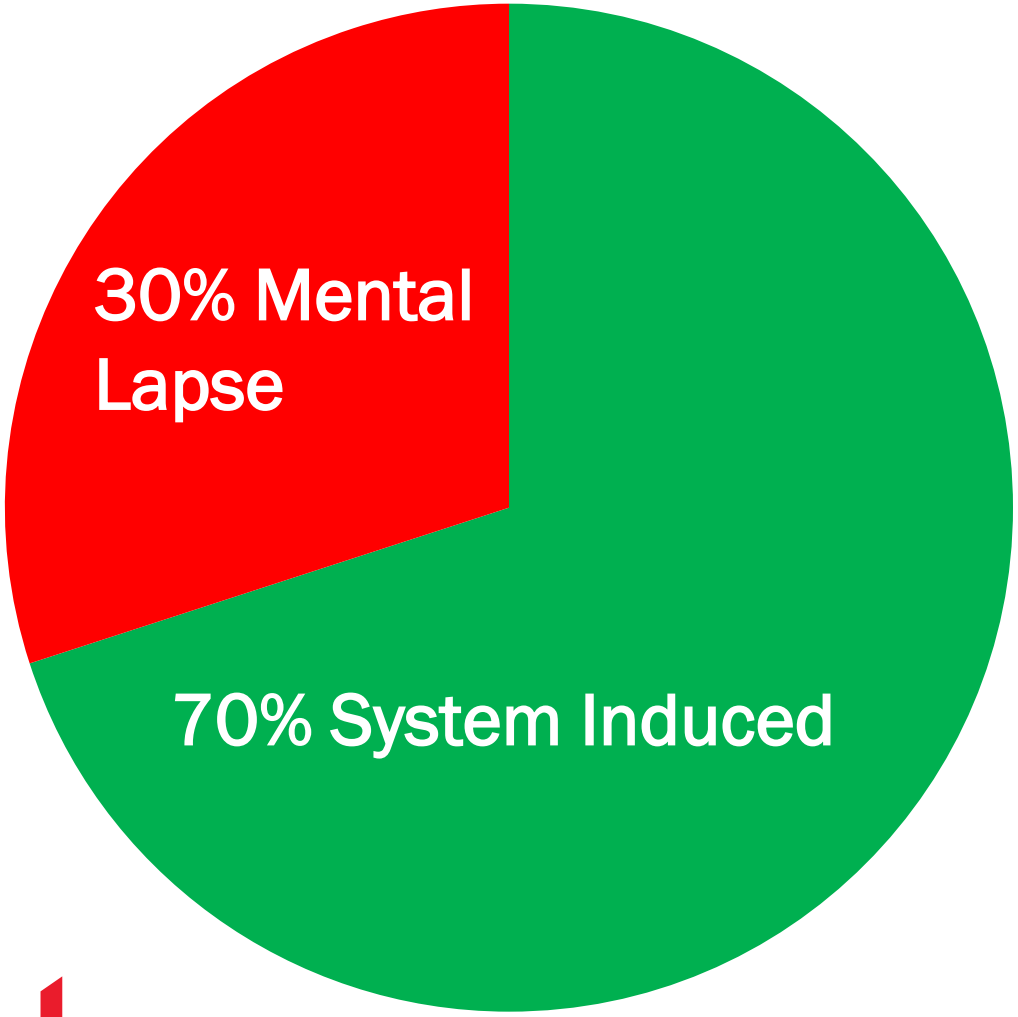
# HP ACTIVITY

# Hawaii Missile Alert




Part of the reason the wrong alert stood for 38 minutes was because the Governor did not remember his twitter login and password

# Two Types of Human Error




*Source: Martha Acosta, HP Instructional Designer, DOE*

# DOMINO'S PIZZA

**You get fresh, hot pizza delivered to your door in 30 minutes or less - or it's free.**

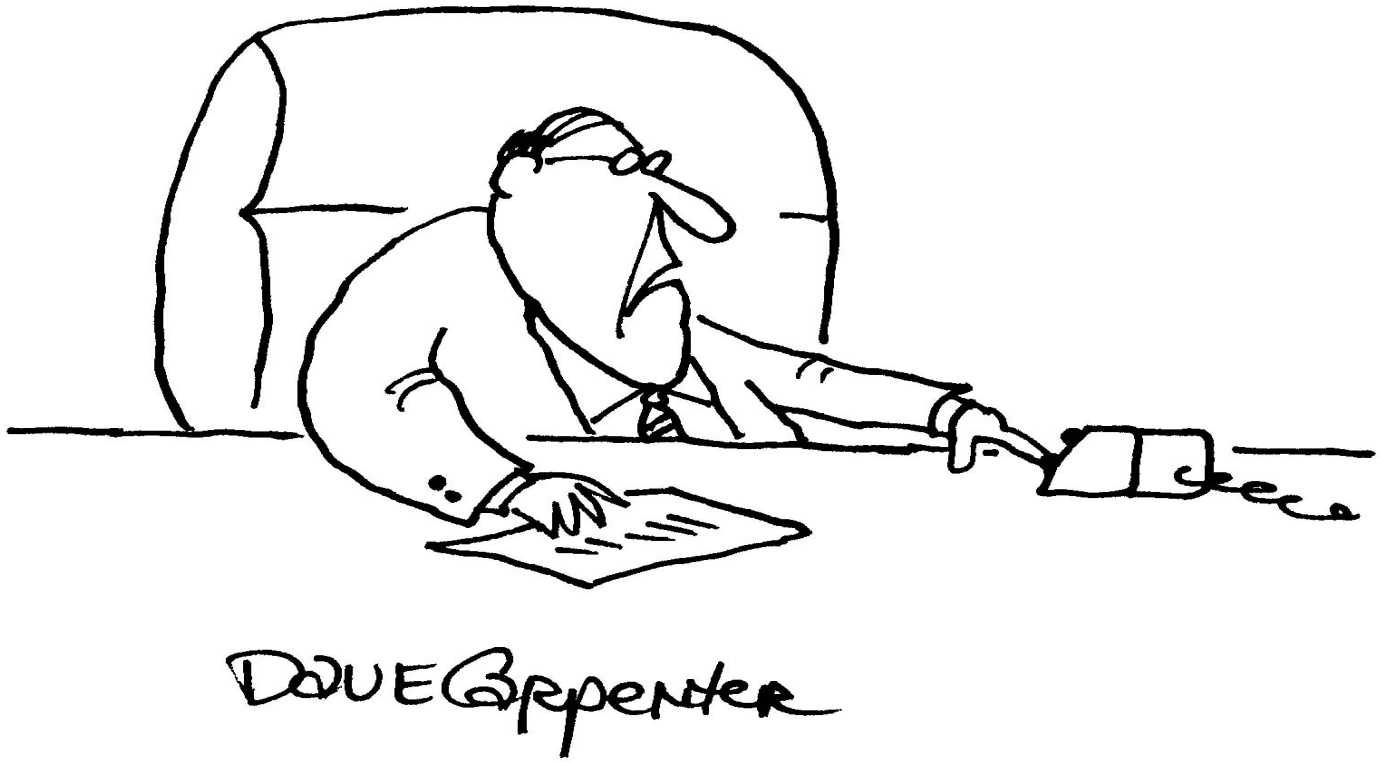
# All Require Different Responses

- System-induced error = Fix system
- System-induced behavior = Fix system
- Human error = Consequence-control
- Culpable behavior = Coaching or punishment

# Old View vs. New View

- Old View #1 – Crime & Punishment Model
- Old View #2 – Bad Apple Model
- New View – Diagnose & treat

# Blame, Shame, & Retrain

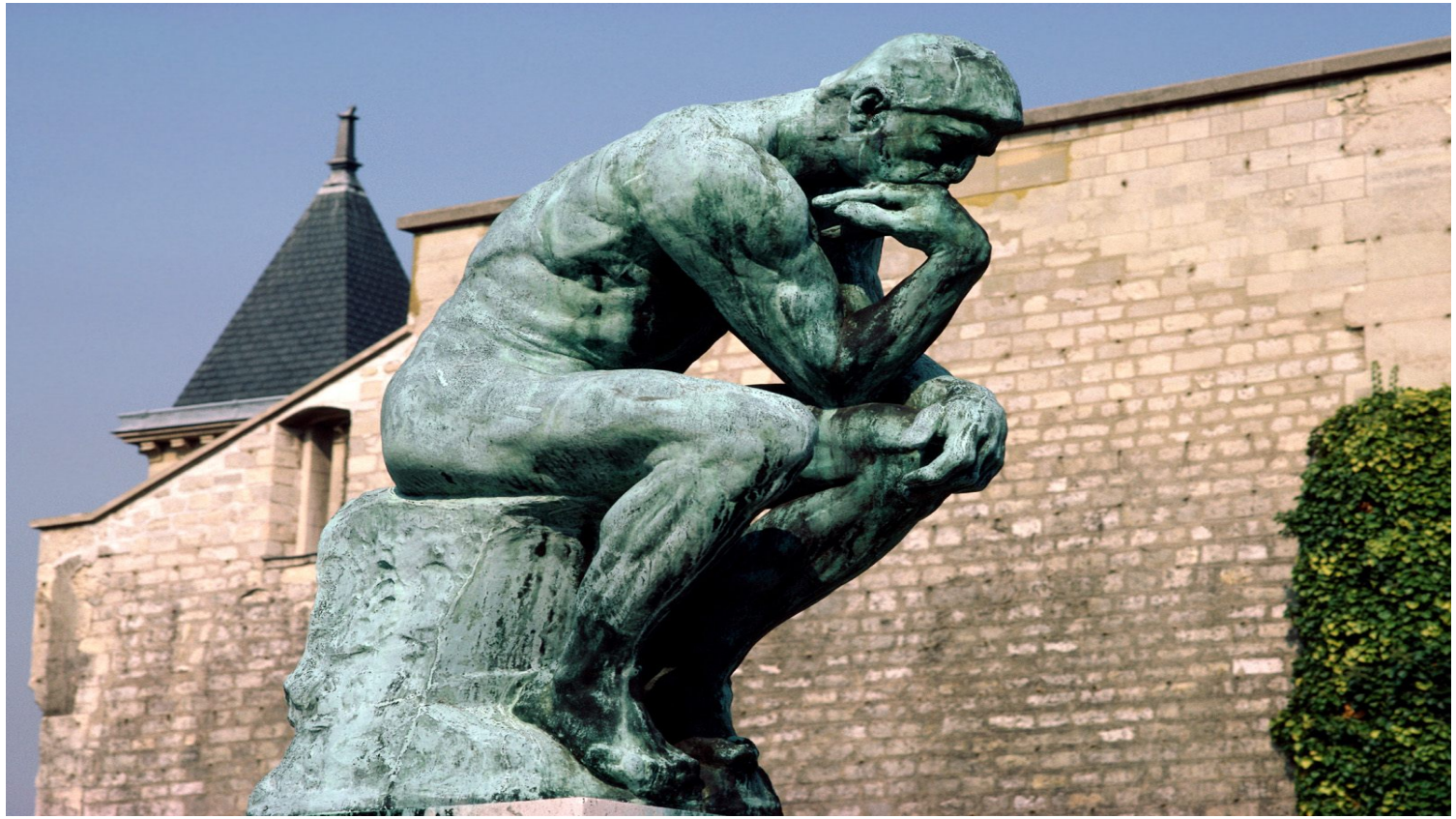



"MISS WILCOX, SEND IN SOMEONE TO BLAME."

# Rule Enforcement

- Adding or enforcing existing rules/procedures does not guarantee compliance.
- Rules are important but they are the last line of defense
- Going overboard may actually widen the gap between procedures and practice.

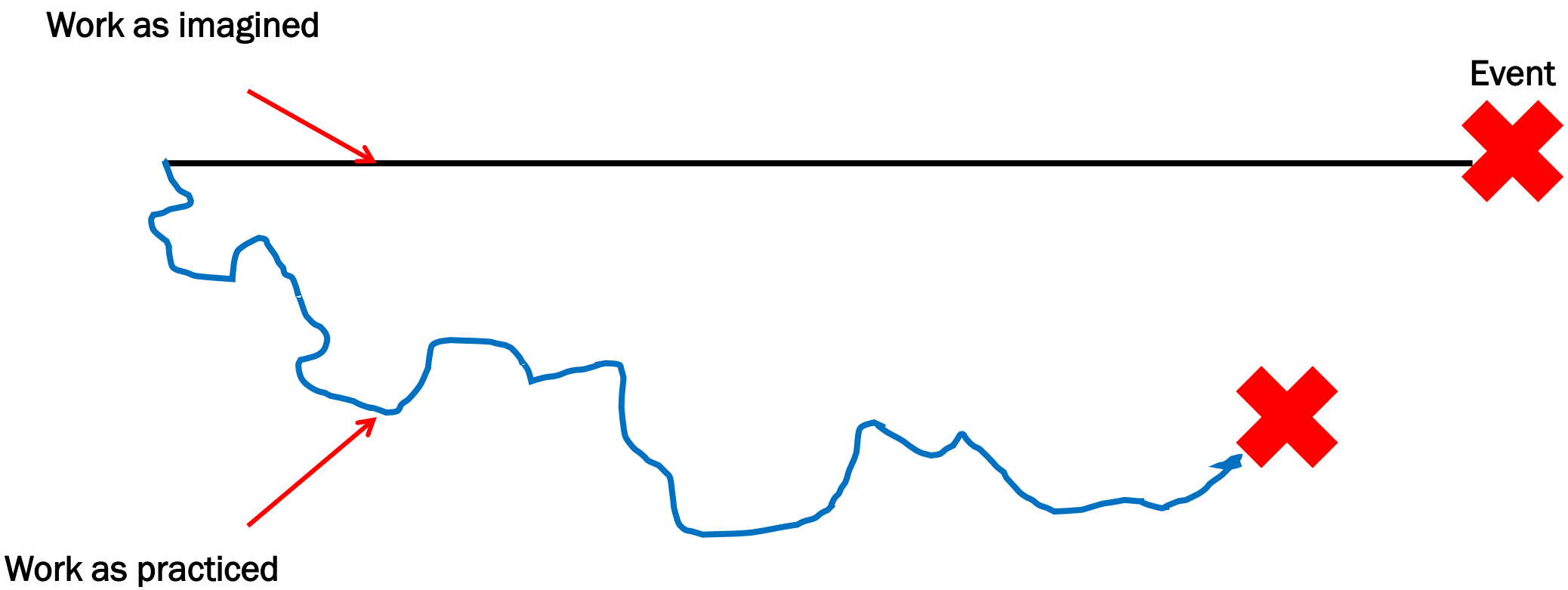
# New View



# New View

- Human error is a symptom of trouble deeper inside a system.
- To explain failure, do not try to find where people went wrong.
- Instead, find out how people's decisions and actions made sense to them at the time, given the circumstances that surrounded them.

# Work as Imagined vs. Work as practiced



# Why Move To The New View?

## Old View

- Workers are the problem and must be controlled
- Tell them what to do
- Count the absence of events/negatives

## New View

- Workers are not the problem, they are the solution
- Ask them what they need
- Count the presence of defenses and positive capacity

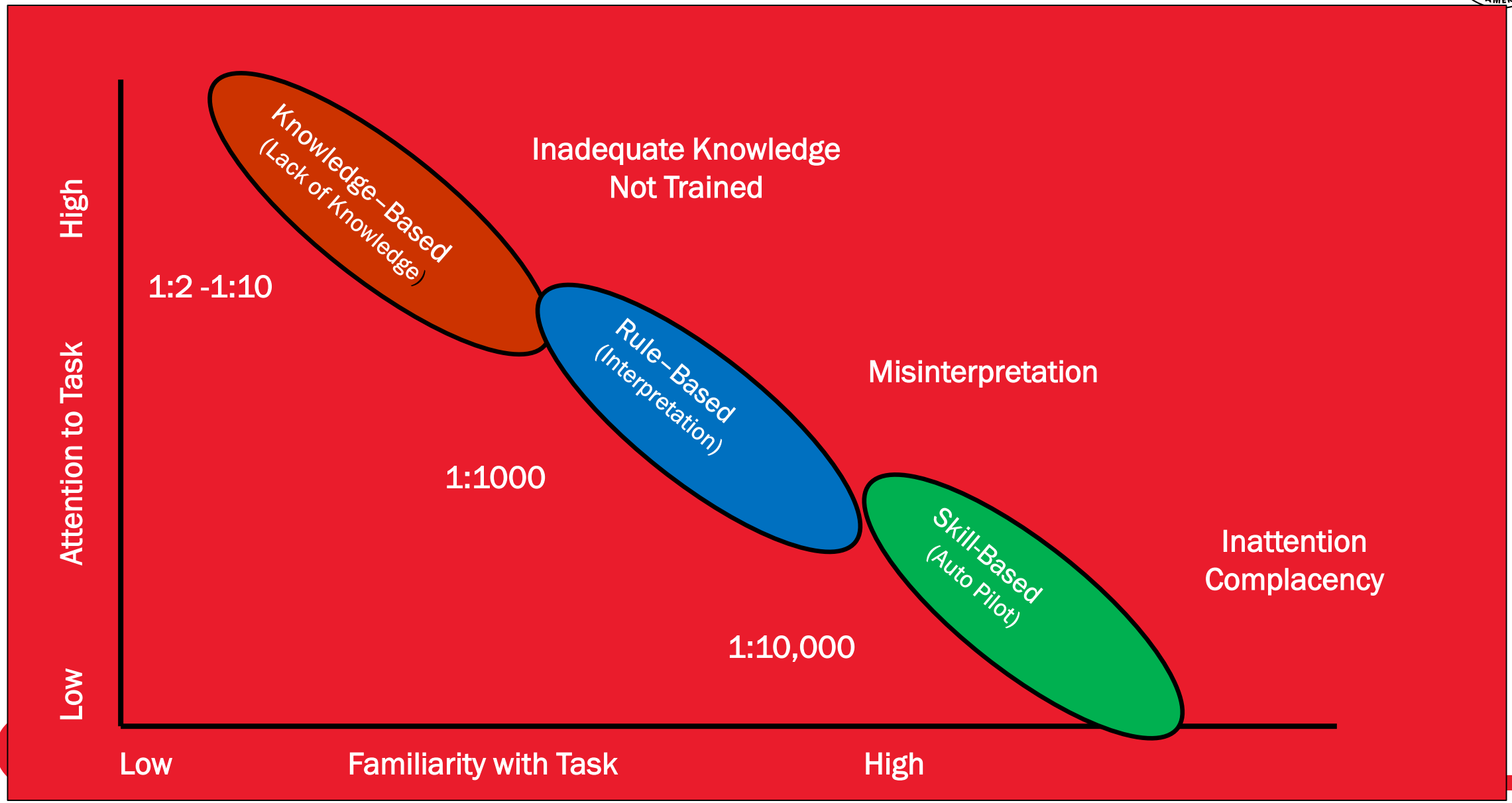
# Error Precursors

- Four categories:
  - Task demands
  - Individual capabilities
  - Work environment
  - Human nature

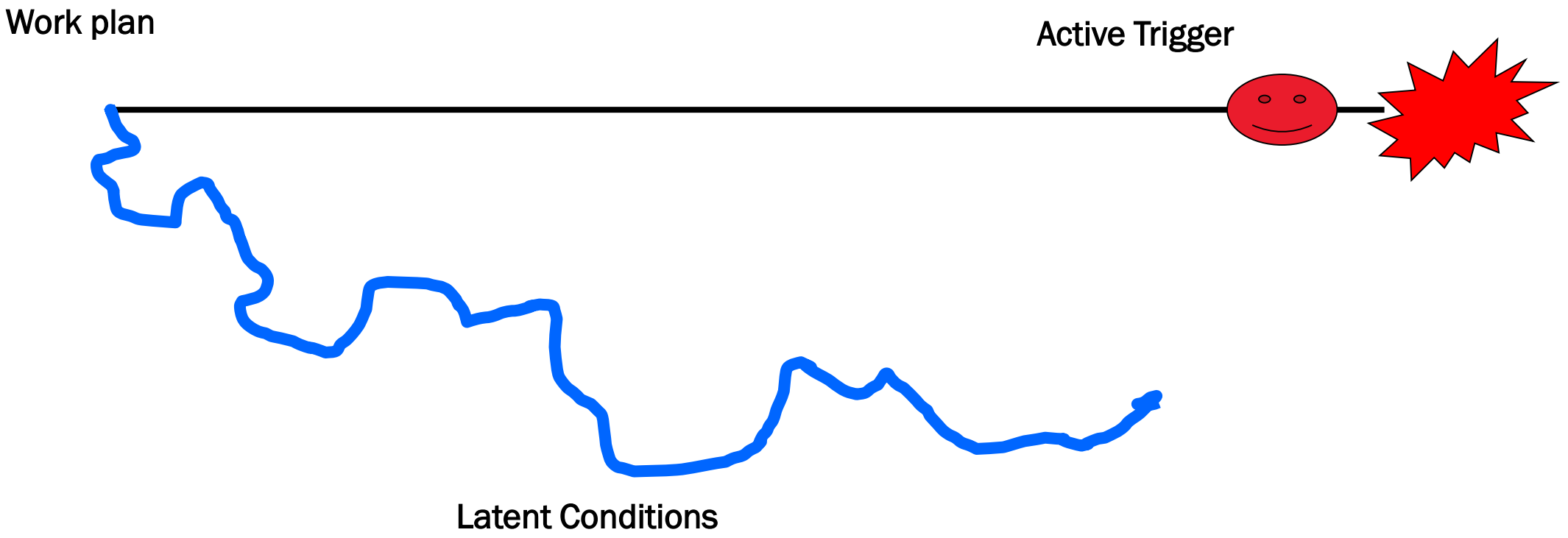
# Error Traps

- Confusing controls
- Mislabeled components

# Performance Modes



# Active Triggers vs. Latent Conditions



**Active triggers are like mosquitoes. They can be swatted one by one, but they still keep coming.**

**The best remedy is to create more effective defenses and to drain the swamps in which they breed.**

**The swamps, in this case, are the ever present latent conditions.**

**Sidney Dekker**

# Organizational Drift

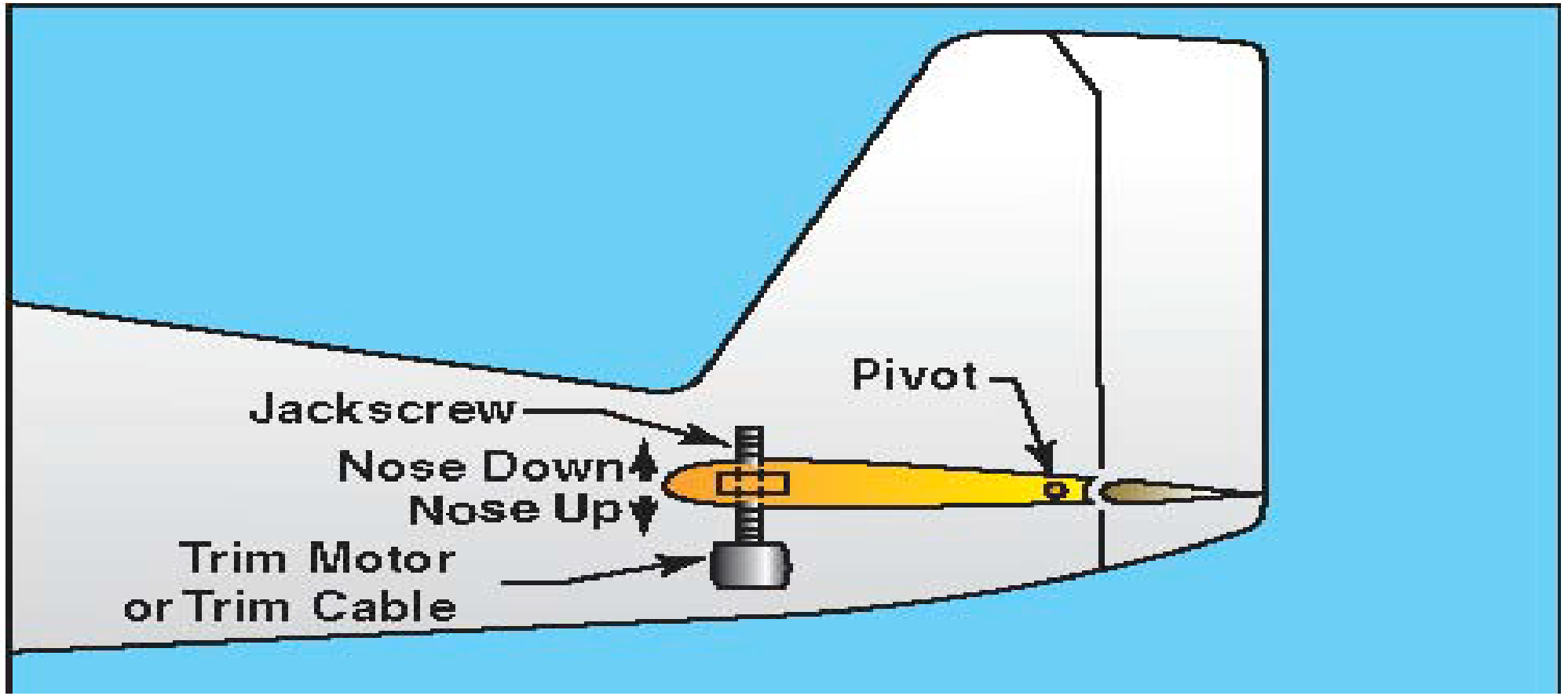
Organizations and individuals tend to drift from rules, procedures, and practice.

# Organizational Drift

- Drift is driven by cultural pressures, unreliable technology, and social processes that normalize growing risk.

- Drift is a gradual, incremental decline into disaster.

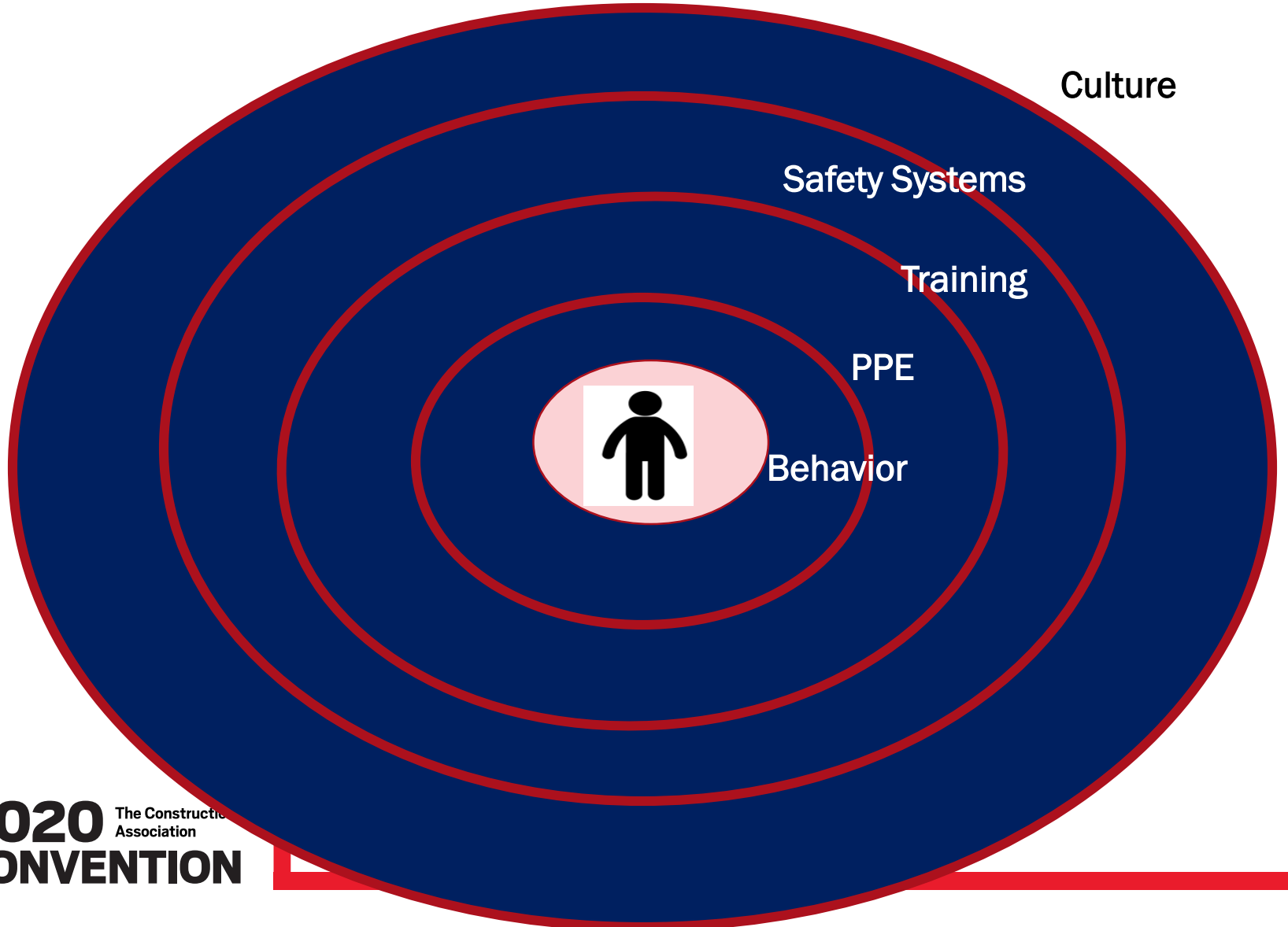
# Airplane Jackscrew



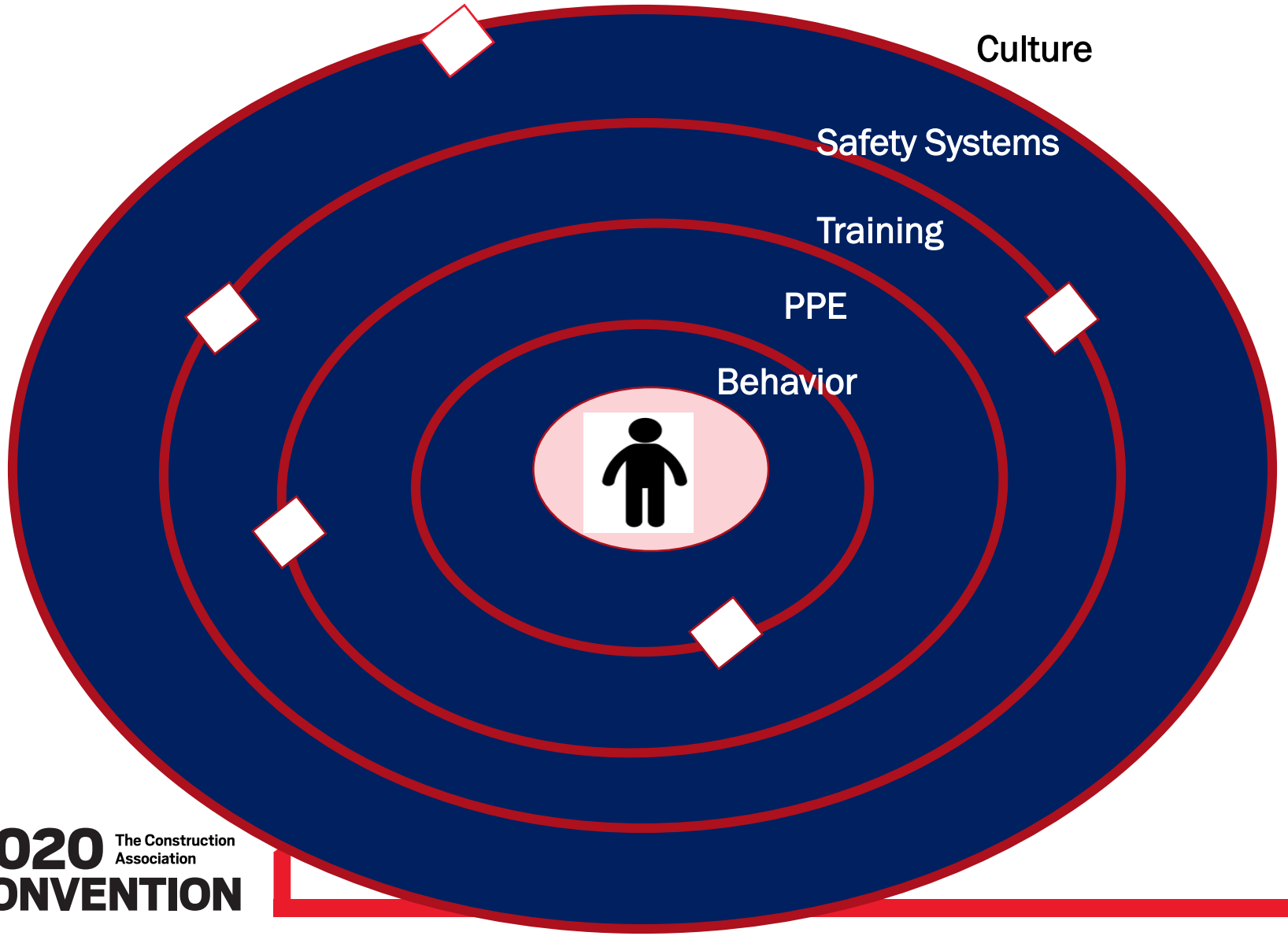
Safety is not the absence of events

It is the presence of defenses

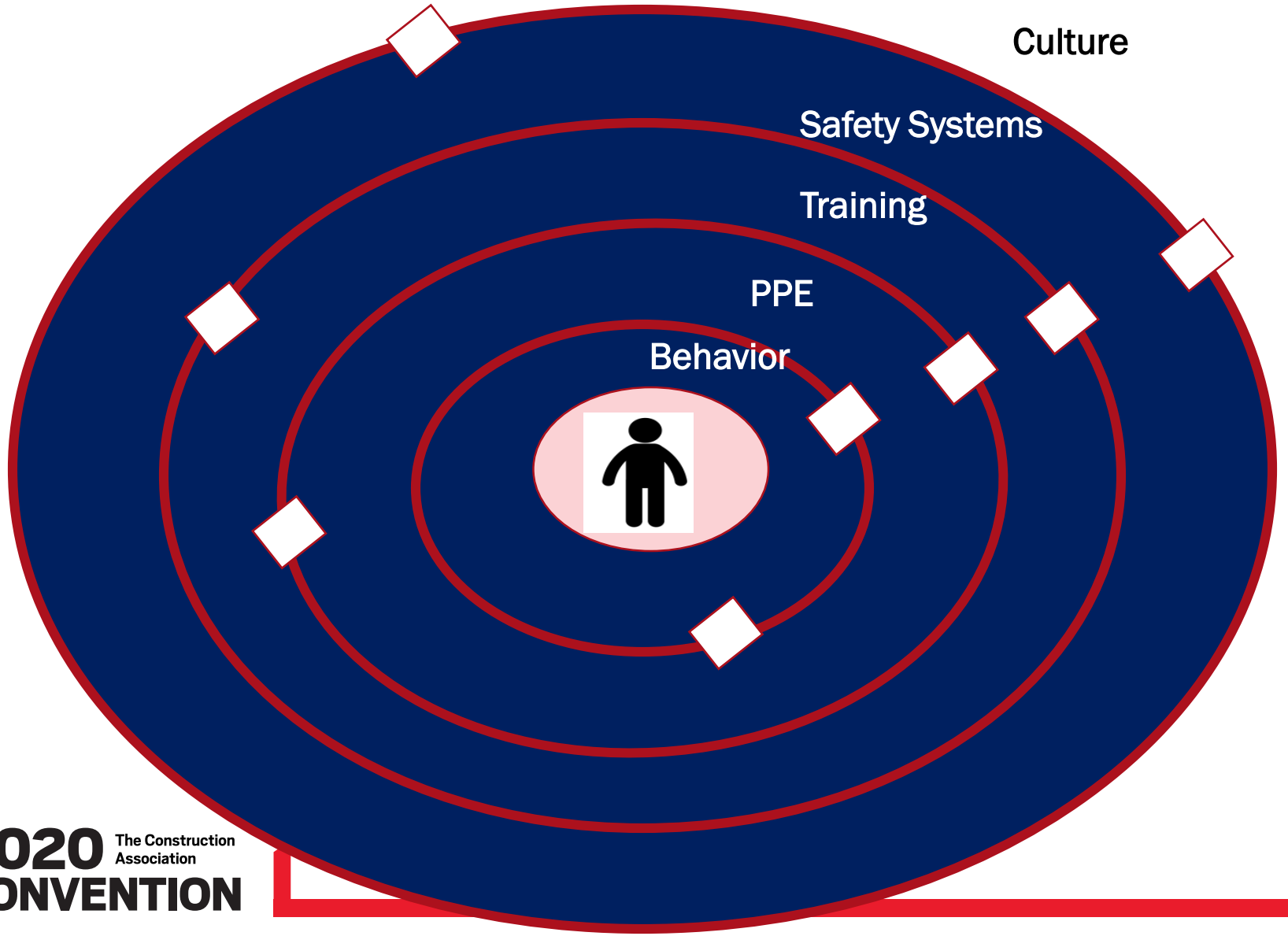
# Presence of Defenses



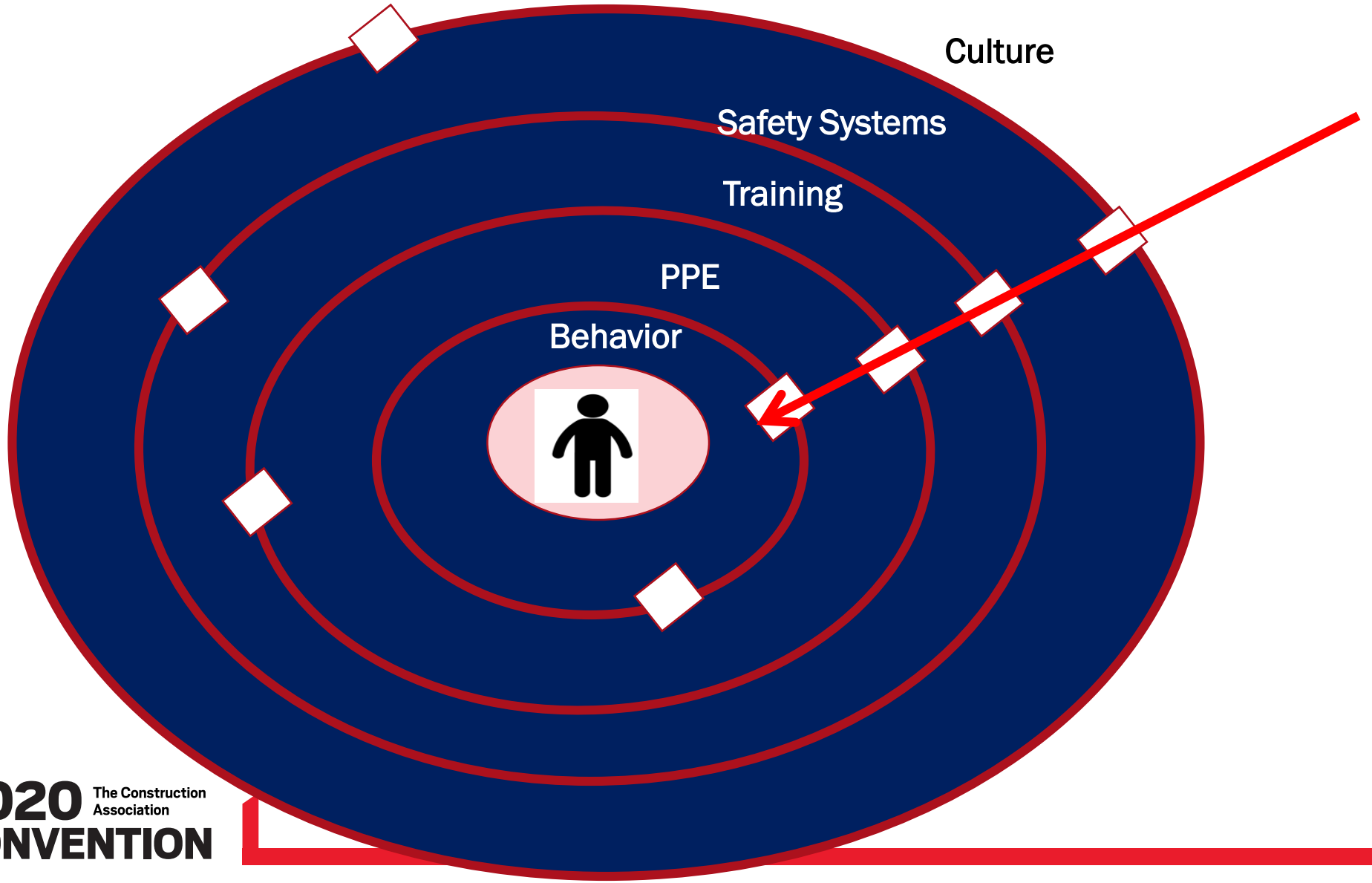
# Gaps in Defenses = Latent Conditions



# Gaps in defenses set the stage for active triggers

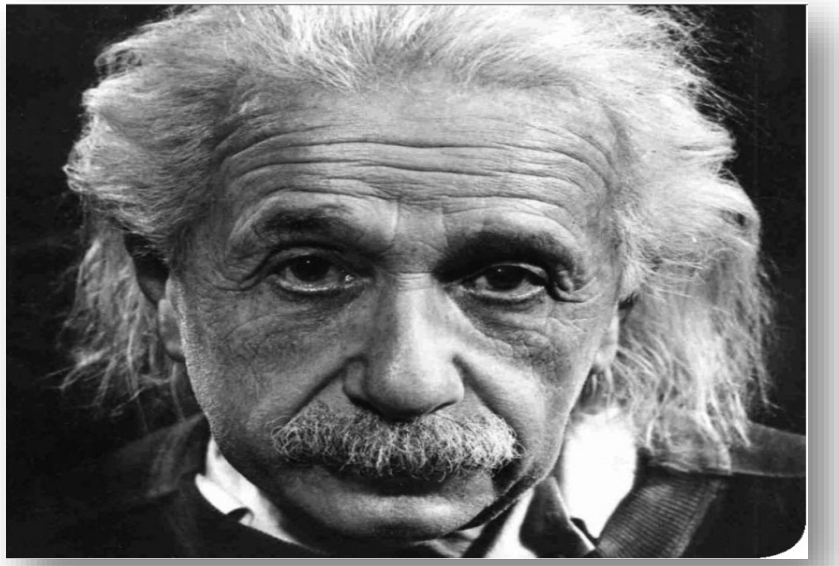


# When gaps line up–error can trigger an incident



*“There is nothing that is a more certain sign of insanity than to do the same thing over and over and expect the results to be different.”*

Einstein



# Questions?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