The journey we are on . . .
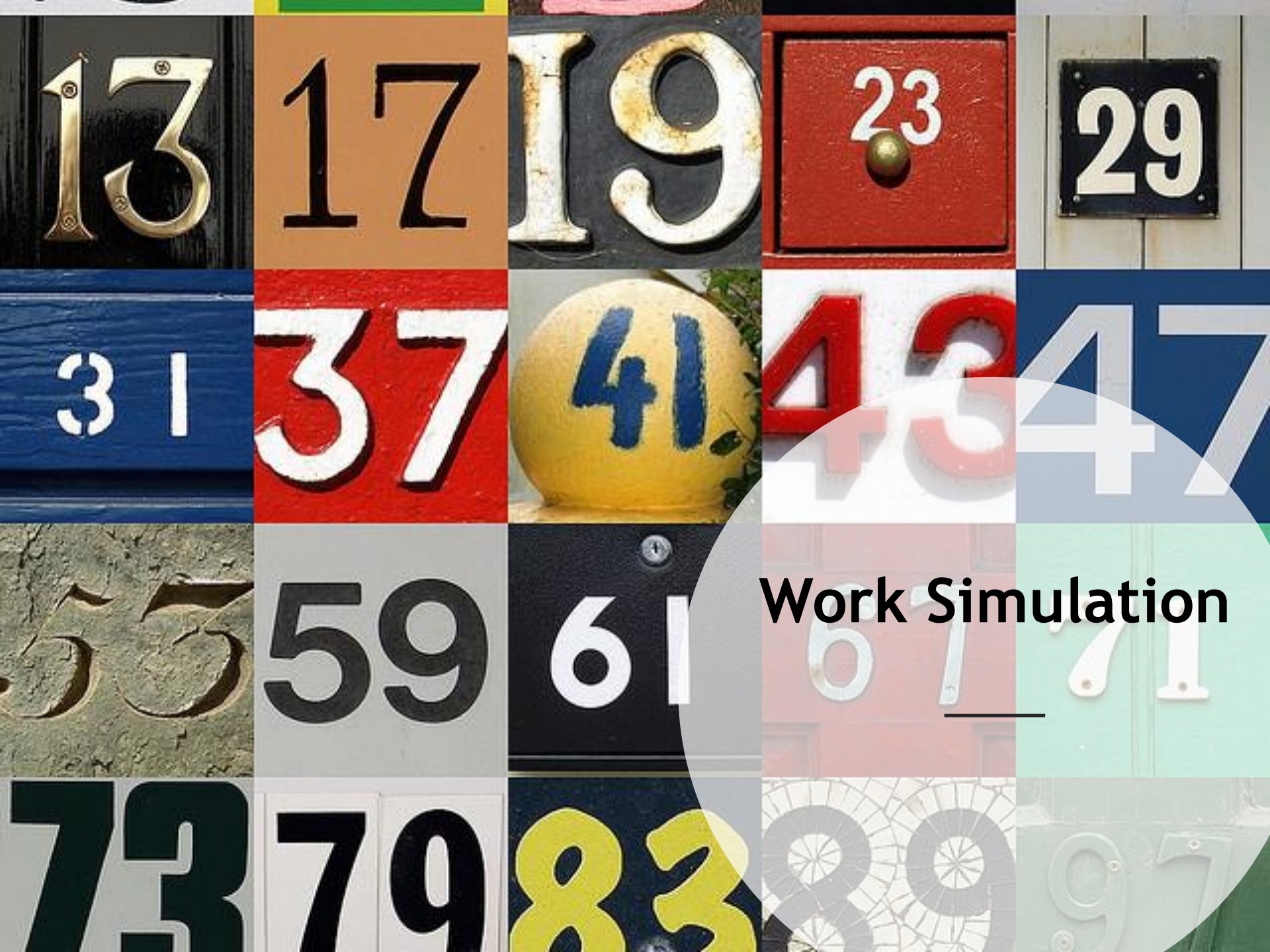
Human and Organizational Performance Foundations

Bob Edwards

Work Simulation
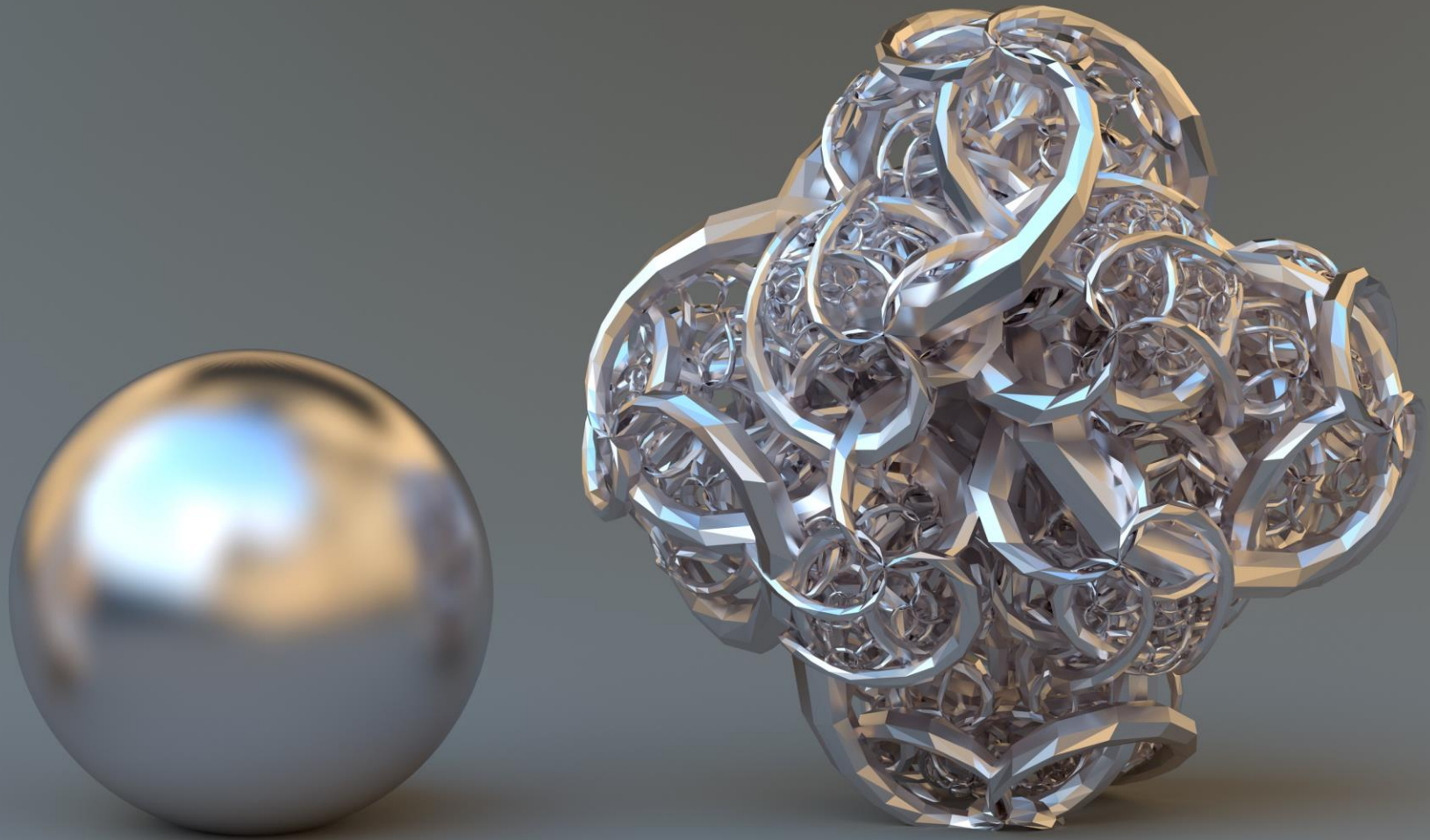
1ˢᵗ Industrial Revolution

Industry 4.0

Complex Systems

A Sense Making Model for Systems (The Cynefin Framework)

Complex

Complicated

Ordered Systems
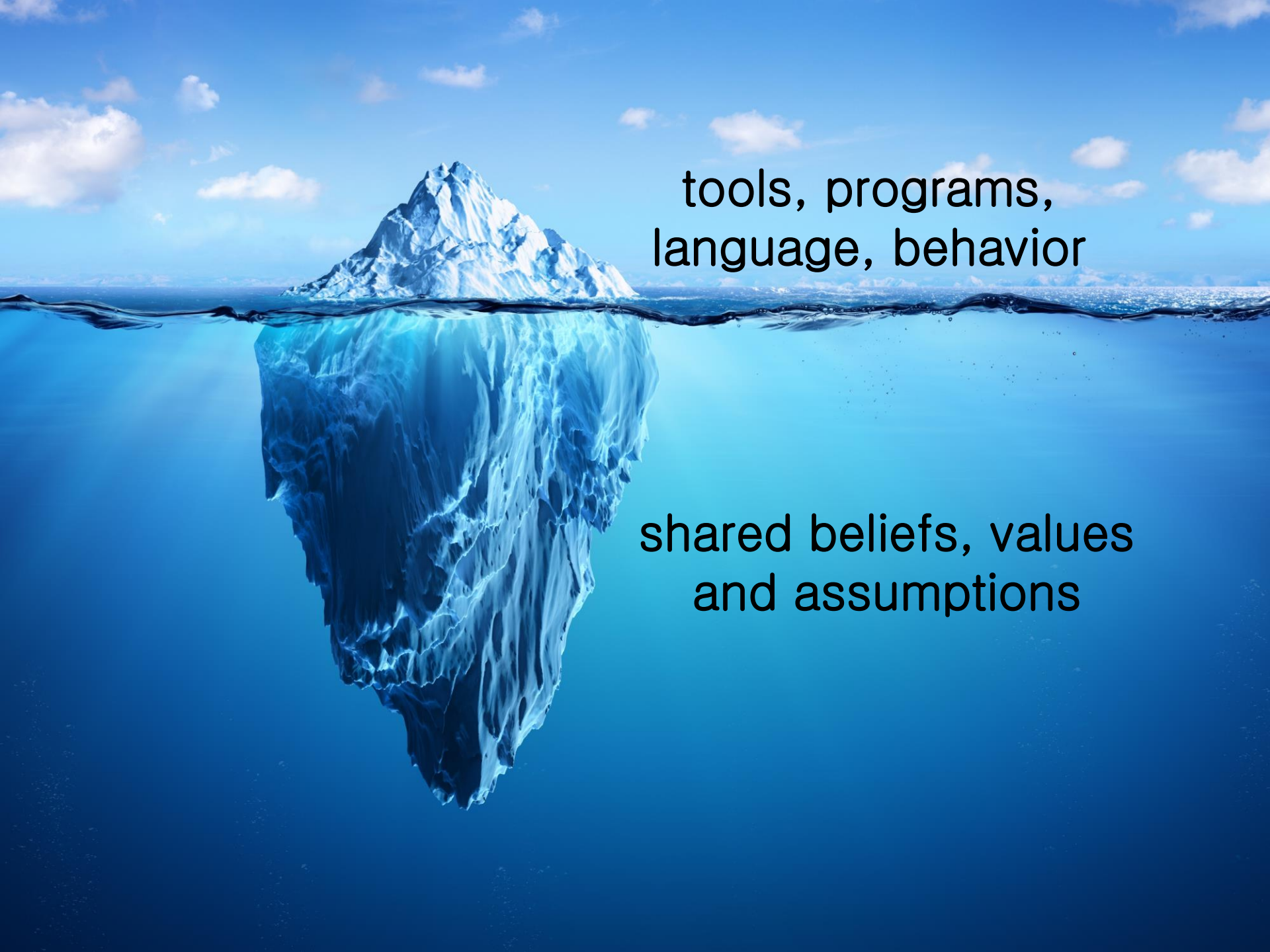
Chaotic

Simple

(David Snowden)

programs, practices, rituals

shared beliefs, values and assumptions
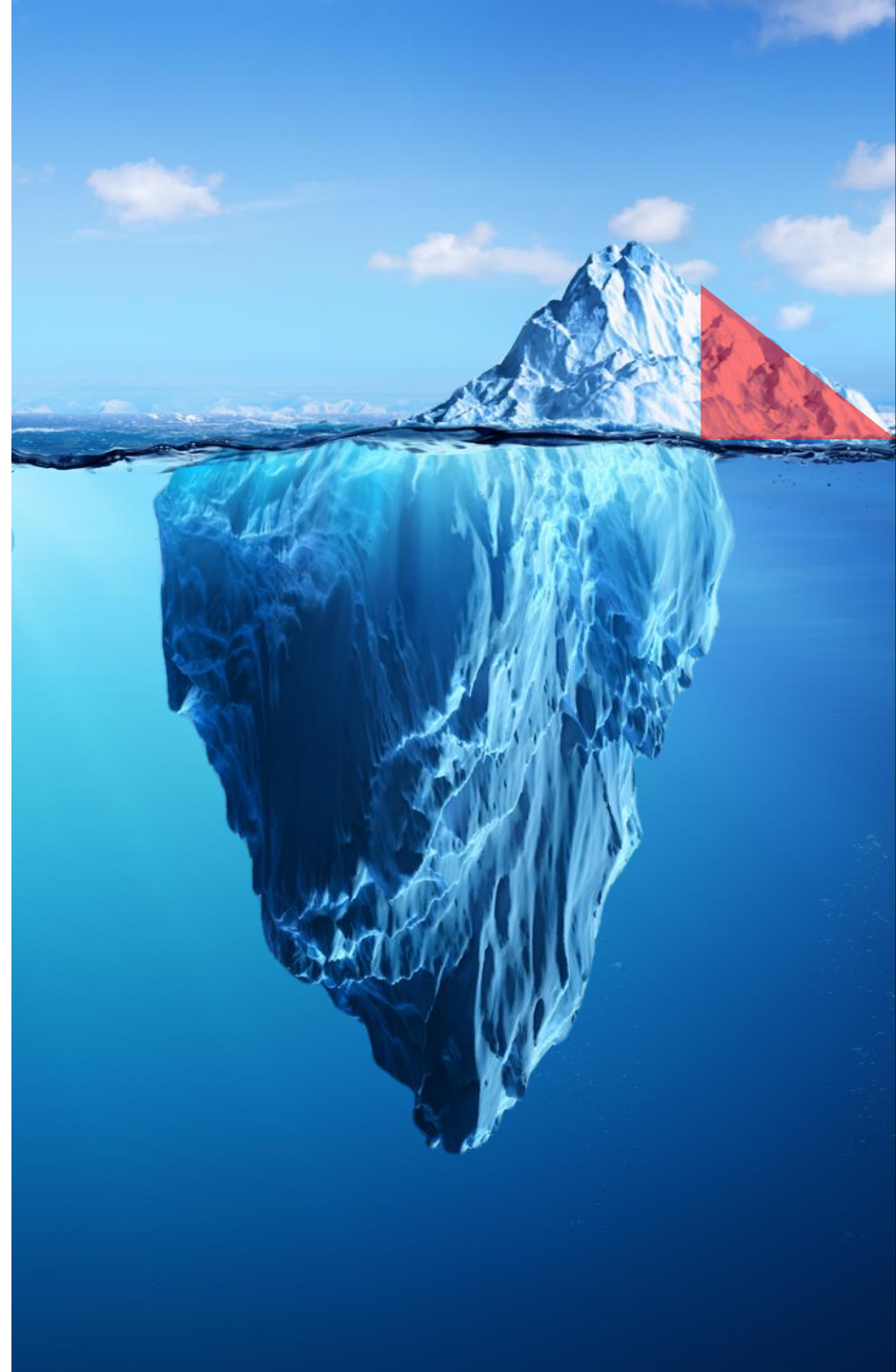
The problem with **AND?**

Efficiency Thoroughness Trade Off

(Hollnagel)

programs, practices, rituals

shared beliefs, values and assumptions
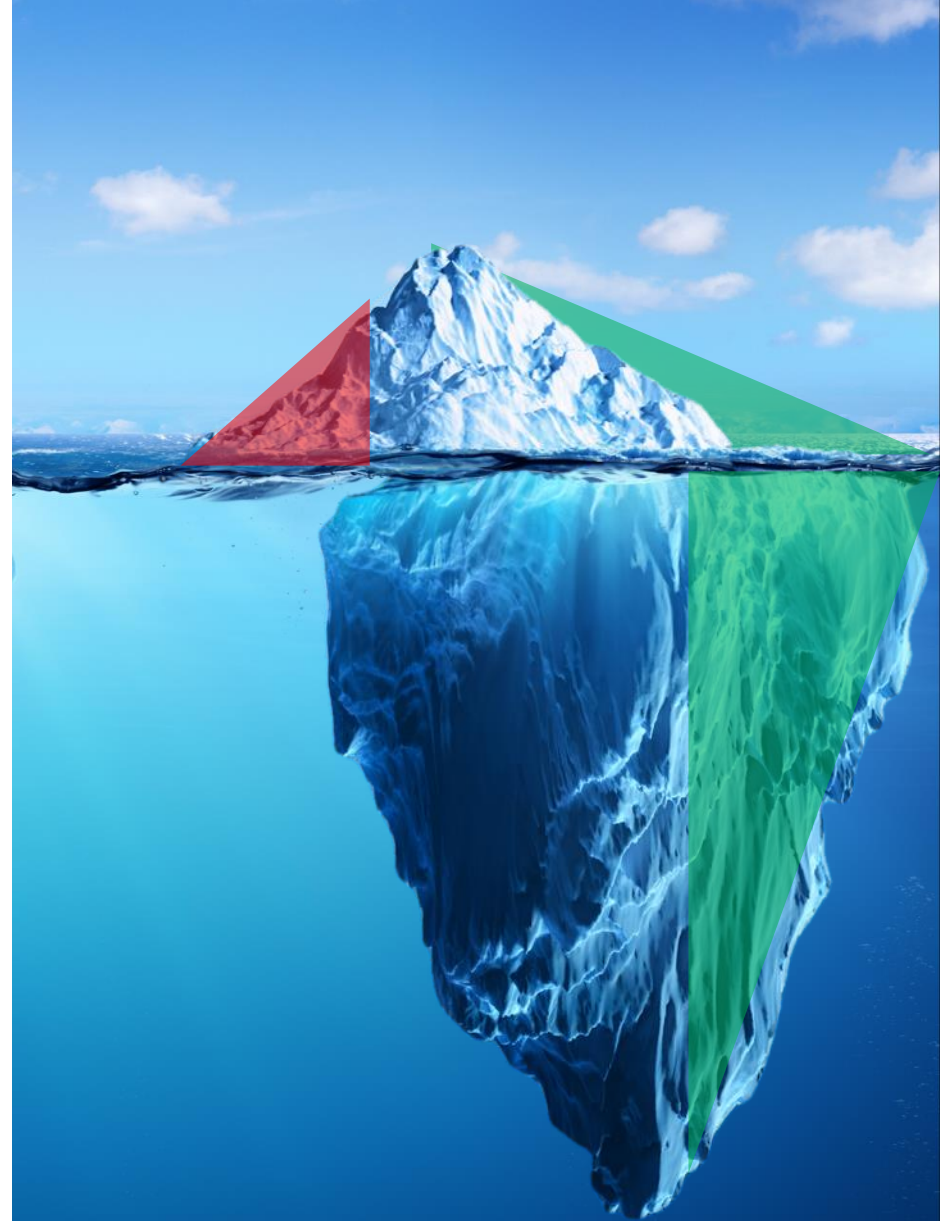
Foundational Beliefs

H.O.P. Foundational Beliefs

➢ Work is Complex
➢ People Make Mistakes
➢ Blame Wastes Resources
➢ Context Drives Behavior
➢ Learning & Improving is Vital
➢ Leader's Response Matters

Assumption: if you try hard enough you won't make mistakes

Error
- Didn't intend my actions
- Didn't intend a negative outcome.

Mistake
- I intended my actions
- Didn't intend a negative outcome.

Person Problem
- I intended my actions
- I intended a negative outcome.

Is error a choice?

Are mistakes a choice?

"Mistakes arise directly from the way the mind handles information, not through stupidity or carelessness."

(Edward de Bono PhD)

Is error bad?

- Error is not intrinsically bad
- Error is normal
- We are error-guided creatures
- We depend on trial and error.

October 1879
(13 ½ Hours)

Error is **not a Choice**...

Error is **not a Violation.**

Error Trap?

Provocative Error Trap?

Emergency Exit Only

Alarm Will Sound

Salida de emergencia solamente.
Sonará la alarma.

SCREEN OFF

P R N D

PUSH

A/C PUSH
MAX A/C

PUSH

TOW/ HAUL

OFF

Norman Door

Assumption: the worker is the problem

"Fundamentally,

people come to work to do what?

Good work!"

Waldorf & Statler

Response to an event

We need to answer the question . . .

*Do we want **retribution?***

or

*Do we want **restoration?***

*We can **blame and punish?***

or

learn and improve?

*But we **can't do both!***

Human or system problem?

Saturday
Jan 13, 2018
8:07 am

⚠ EMERGENCY ALERTS ✕

Emergency Alert
BALLISTIC MISSILE THREAT
INBOUND TO HAWAII. SEEK
IMMEDIATE SHELTER. THIS
IS NOT A DRILL.

Settings

Caleb Jones, AP   Screen capture of Hawaii's alert sent Jan. 13, 2018.

Fundamental Attribution Error

False Alarm

Amber Alert (CAE) - Kauai County Only

Amber Alert (CAE) Statewide

1. TEST Message

PACOM (CDW) - STATE ONLY

Tsunami Warning (CEM) - STATE ONLY

DRILL - PACOM (CDW) - STATE ONLY

Landslide - Hana Road Closure

Amber Alert DEMO TEST

Surf Warning North Shores

- Lots of recent EMA activity due to North Korea threat
- Sirens tested in Dec for 1st time in 30 years
- Test occurred at shift change, non-standard drill time
- Leadership set the drill in motion and acted like it wasn't a drill (disguised voices)
- 5 others on the call – placed on speaker phone part way through (Operator did not hear "exercise, exercise, exercise")
- Operator had confusion on 2 past drills (10 year veteran)
- Most sirens did not work
- Shelters were locked
- Phone and internet overloaded (911 calls didn't work)
- Leadership had to call Pacific Command to verify no threat
- No military base activity taken
- People told to take alerts seriously next time.

"insufficient management controls, poor computer software design, and human factors"

"employee had performance issues and had messed up on at least two previous drills"

Resulting in:
- Firing the operator
- EMA manager resigning

Blame fixes nothing!

"It doesn't take phenomenal ability to realize that a person who is given blame learns how to avoid the blame next time, while the person who gives blame learns nothing. As a result, things continue to go wrong . . ."   Bill Salot

H.O.P. is NOT the absence of rules or discipline

. . . its the notion that if you depend on a person doing something 100% right 100% of the time…

…you will be disappointed...

…A LOT

(Andrea Baker)

Don't we need to hold people accountable?

What is accountability?

We have confused the ideas of accountability, culpability, and discipline

> Accountability is the **willingness to accept responsibility**, or to account for ones actions.
>
> – *Merriam-Webster dictionary*

tell the story of

- Not punishment
- Not retribution
- Not something you can "do" to a person or "extract" from a person

Accountability is not something that management can demand, or dictate, or punish people into compliance with.

–Tim Autrey

(Andrea Baker)

The less we know. . .

. . . the more we tend to blame . . .

. . . the more we blame . . .

. . . the less we are going to learn.

Charles Major - Luminant

"No one, and I mean no one, has punished their way to operational excellence!"

Trust is a lot to ask?

Lets start with establishing an environment where we can at least be honest!

"...blame is the enemy of understanding."

(Andrew Hopkins)

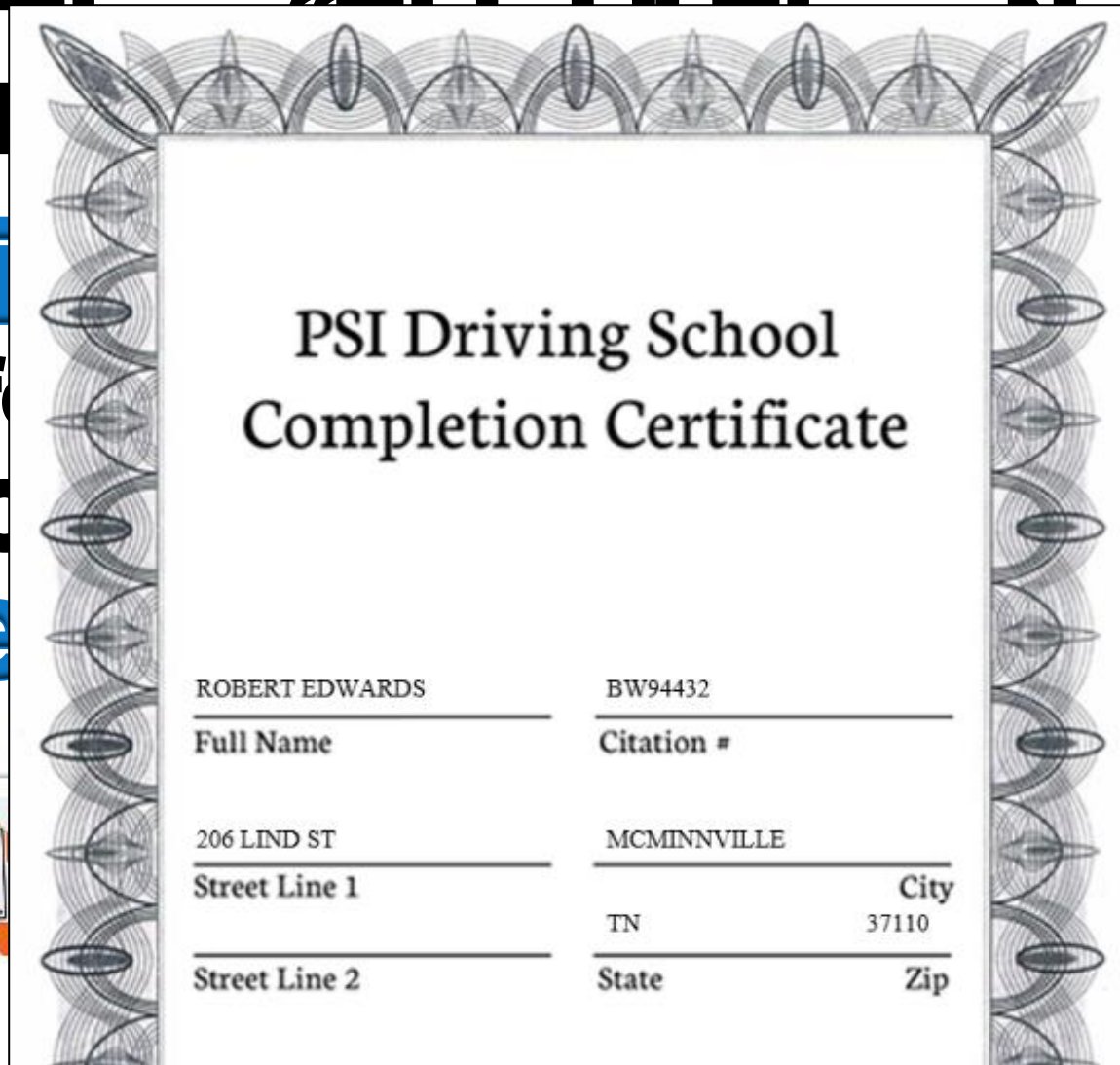**People** Are As **Safe** As They "Think" They Need To Be, **Without** Being Overly Safe... In Order To Get Their **Job** Done.

(Conklin/Edwards)

Drivers Are As Safe As They "Think They Need To Be"

Will Only Drive Safely In Case of Death

PSI Driving School
Completion Certificate

ROBERT EDWARDS

Full Name

BW94432

Citation #

206 LIND ST

Street Line 1

Street Line 2

MCMINNVILLE

City

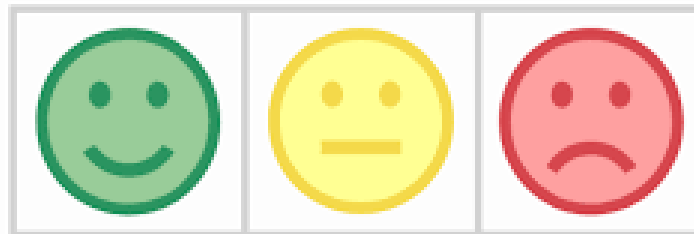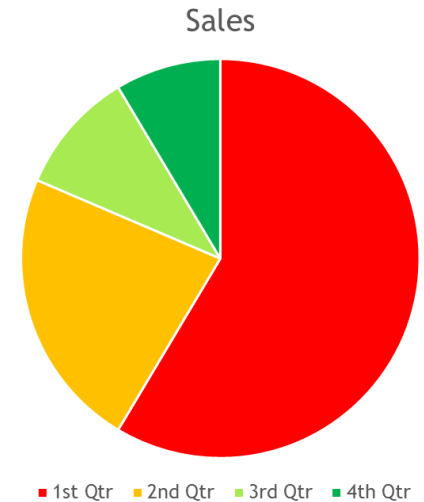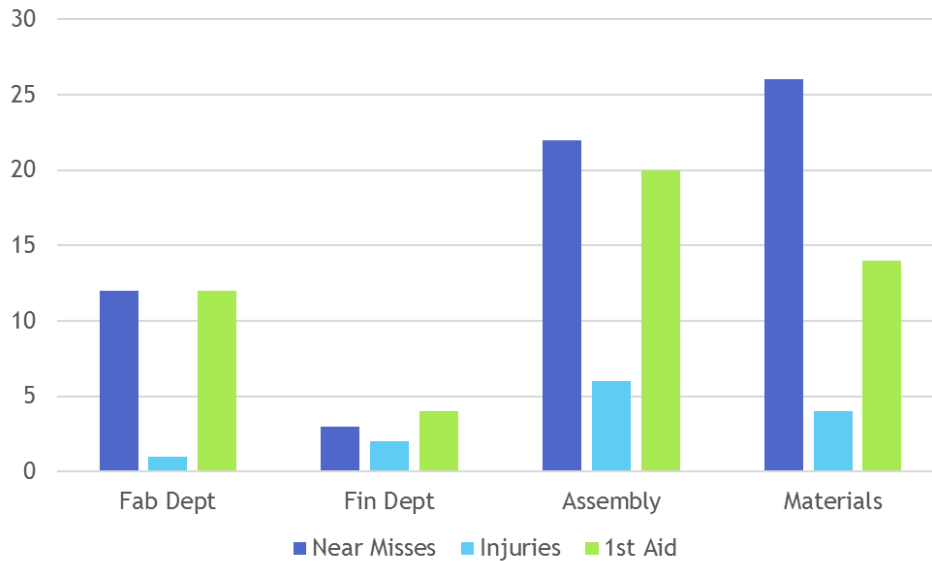TN   37110

State   Zip

ROAD CLOSED

(Edwards)

Assumption: What we measure, we improve.

The METRIC Bias
"what gets measured gets improved"
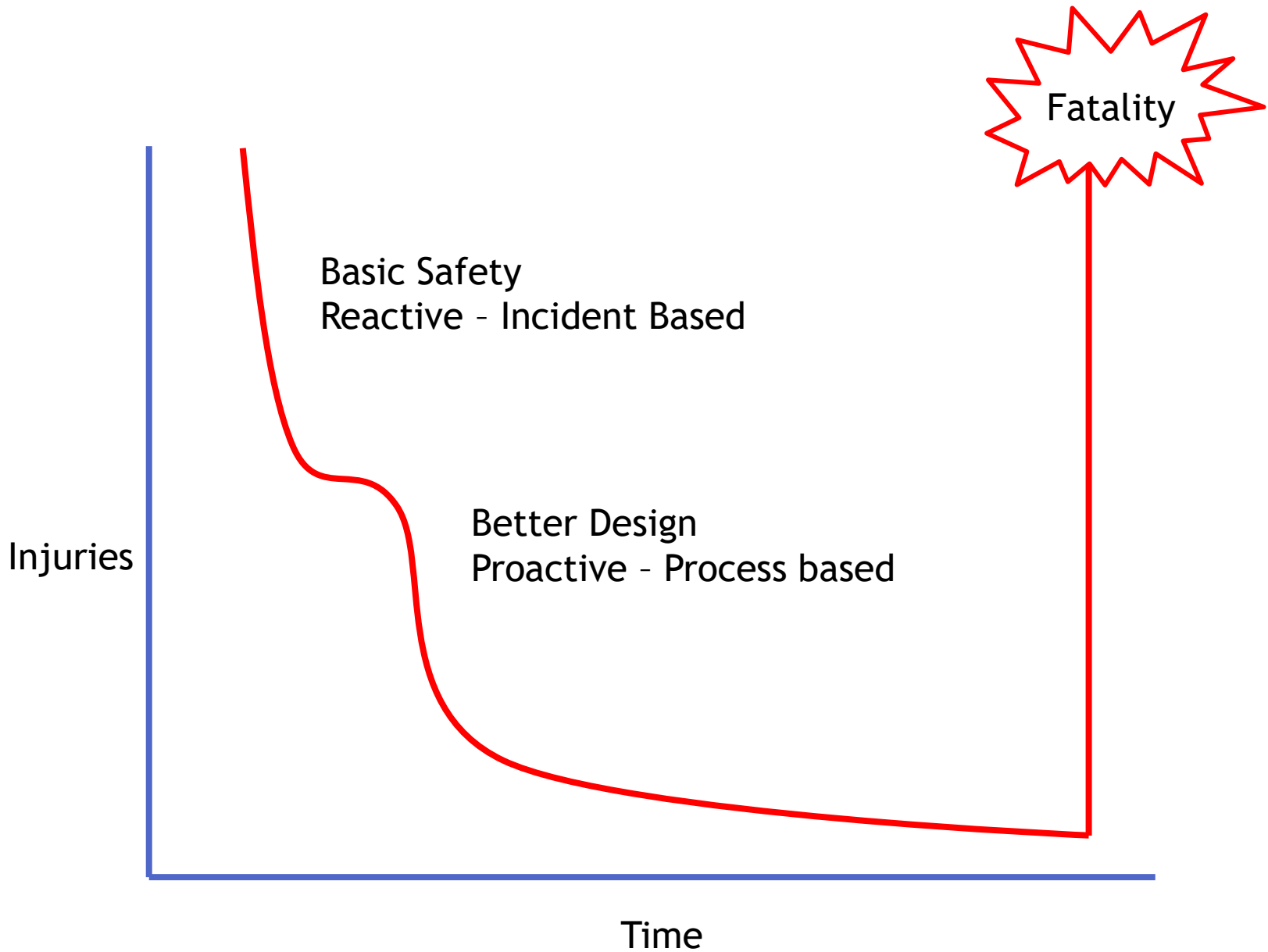
Metrics?

Have we become **managers of metrics?**

Instead of **leaders of people?**

We often measure what is easy to measure but may not be that important, because often times the things that are important are hard to measure.

The Tyranny of Metrics, J. Muller

Great metrics don't necessarily mean you have great performance.

*"Do we know how brittle
we actually are?"*

(David Payne)

*Can we **change people's behavior?***

Changing Behavior??

Behavior Modification
Behavior Change

↑

Belief Systems (Values)

What gets rewarded –
gets repeated (positively and negatively)

(Edgar Schein)

"You cannot change the human condition, but you can change the conditions under which humans work"

James Reason

Our **Goal** . . .

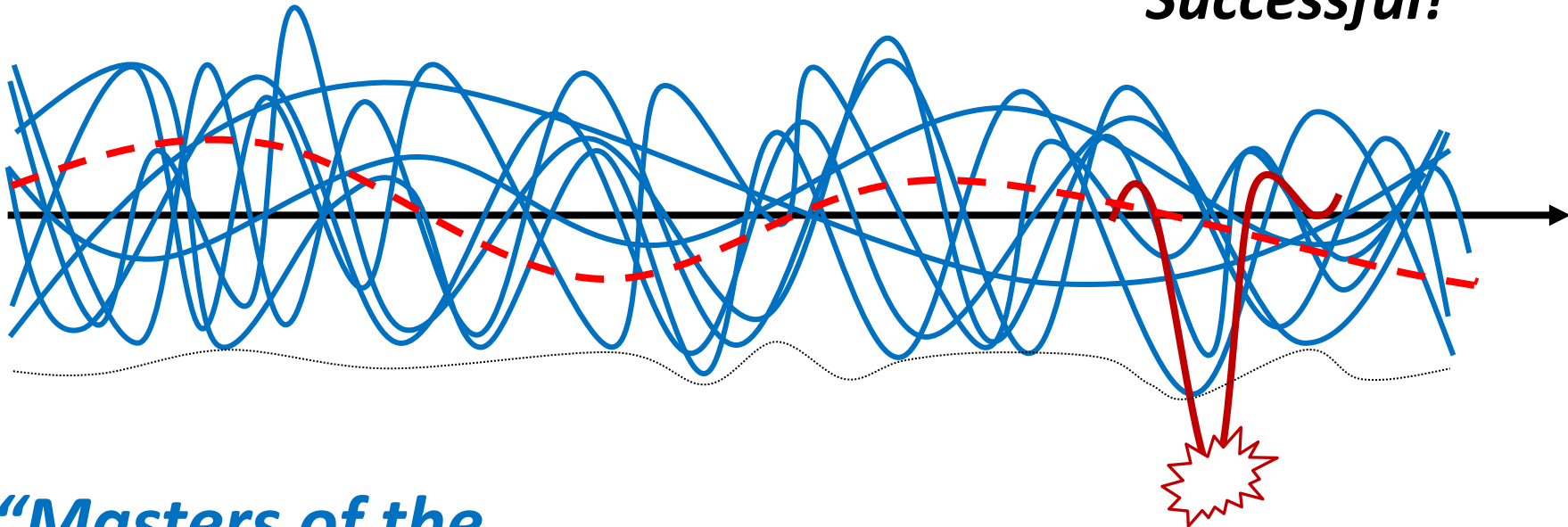. . . is to become **less surprised** by human error and failure . . .

. . . and instead, become a **lot more interested in and a lot better at operational learning!**

(Edwards)

Failure is a combination of normal variability

Work as planned

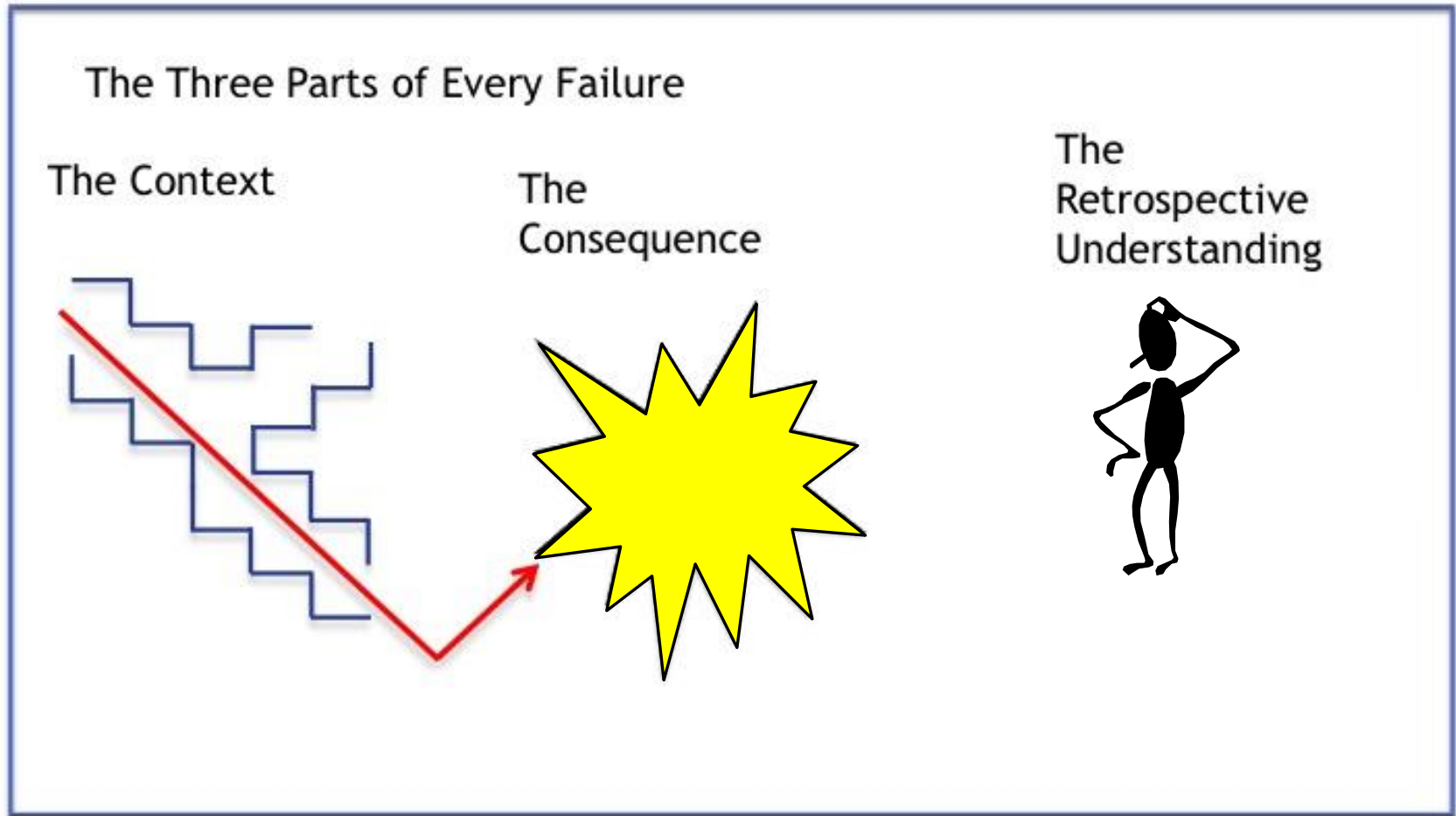## Reality

Normally Successful!

"Masters of the blue line"

(Hollnagel, Conklin, Baker, Edwards)

3 Parts of an Event

The Three Parts of Every Failure

The Context

The Consequence

The Retrospective Understanding

(Conklin)

3 Parts of an Event

The Challenge:

Not to let

post-event hindsight

bias our judgment of the

pre-event context.

(Conklin)

Bloomberg

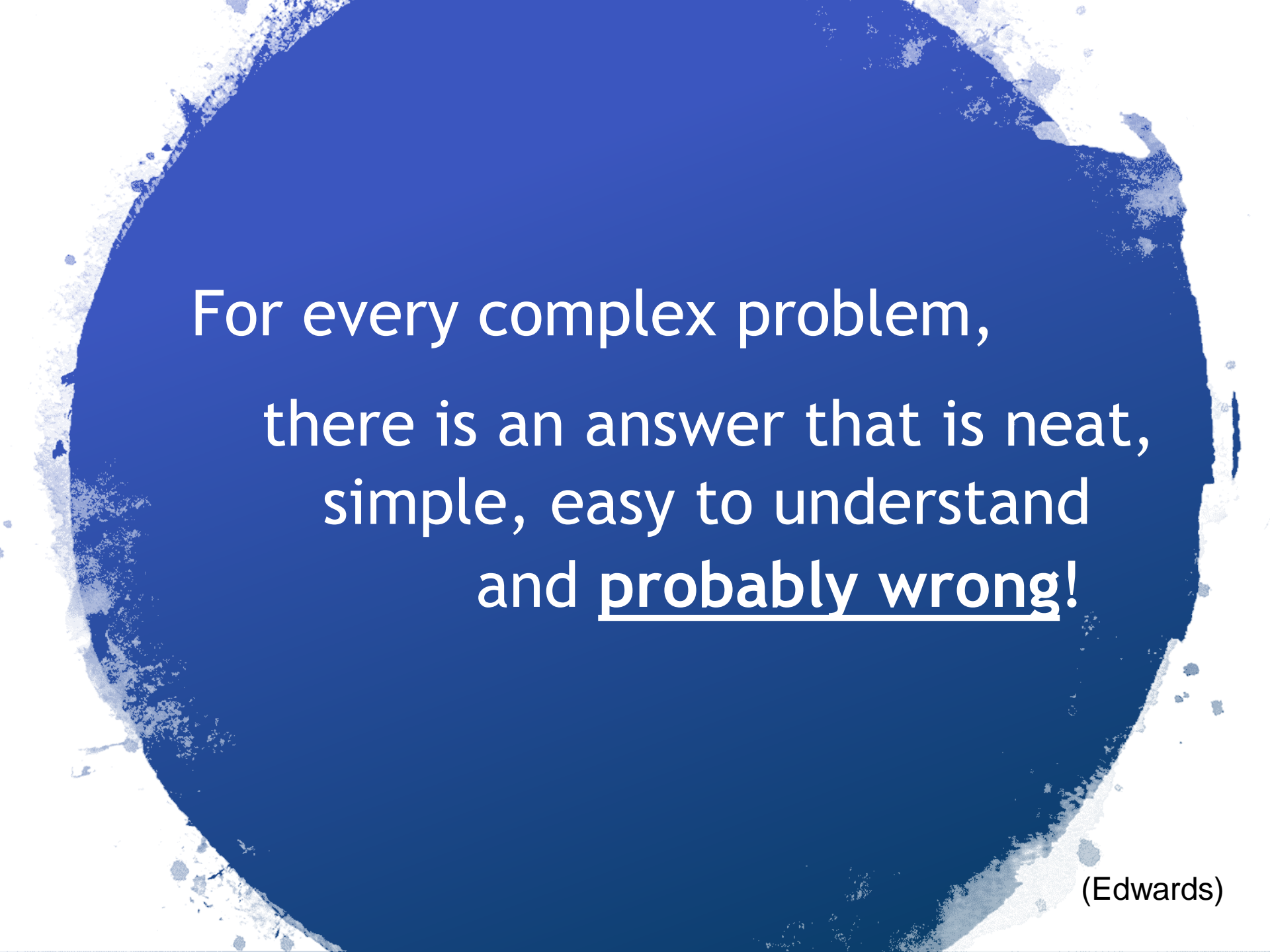SFO PLANE CRASH: WHO WAS AT FAULT?

For every complex problem,

there is an answer that is neat, simple, easy to understand and **<u>probably wrong</u>**!

(Edwards)

"Underneath every seemingly obvious, simple story of error, there is a second deeper story. A more complicated story . . . a story about the system in which people work."

(Dekker, 2006)

Some tools lead us to a linear understanding of the event . . .
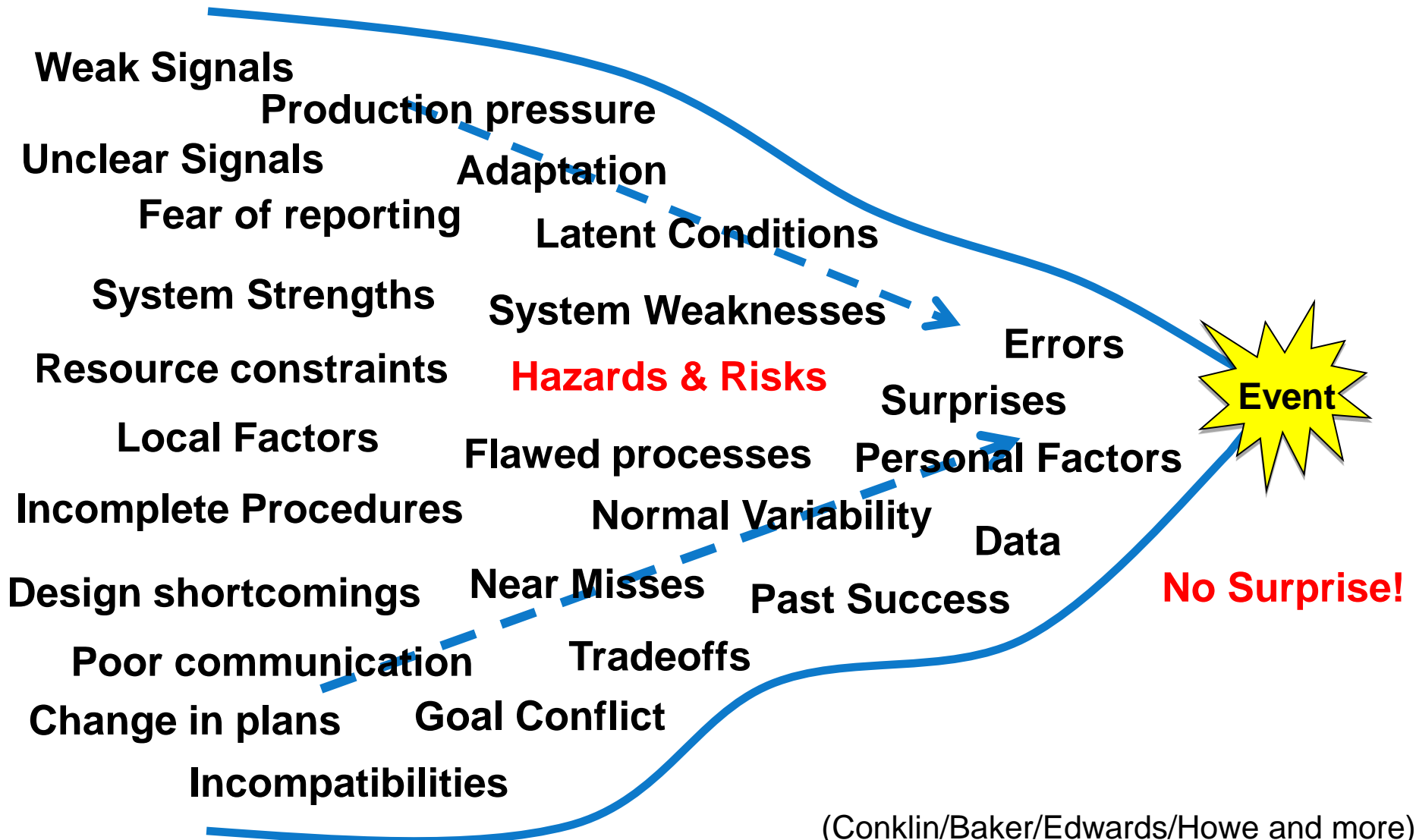
. . . which may be enough

Root Cause? 5 ← 4 ← 3 ← 2 ← 1 ← **Event**
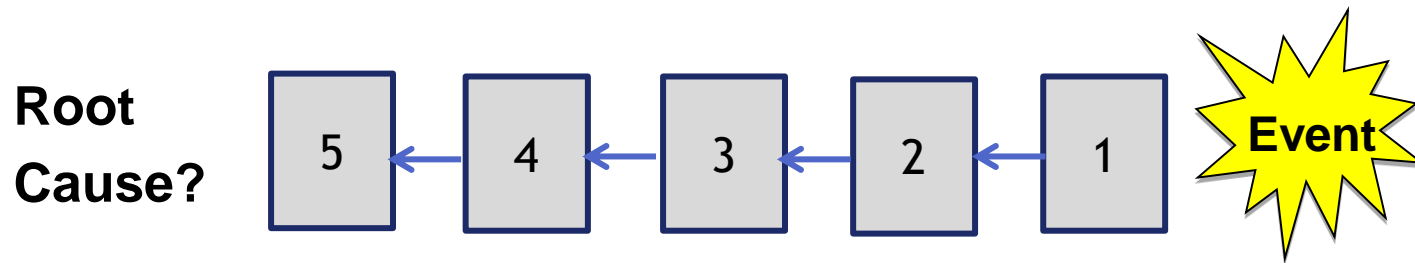
The problem is, complex failures are not linear . . .

. . . and there may not be a single actual root cause.
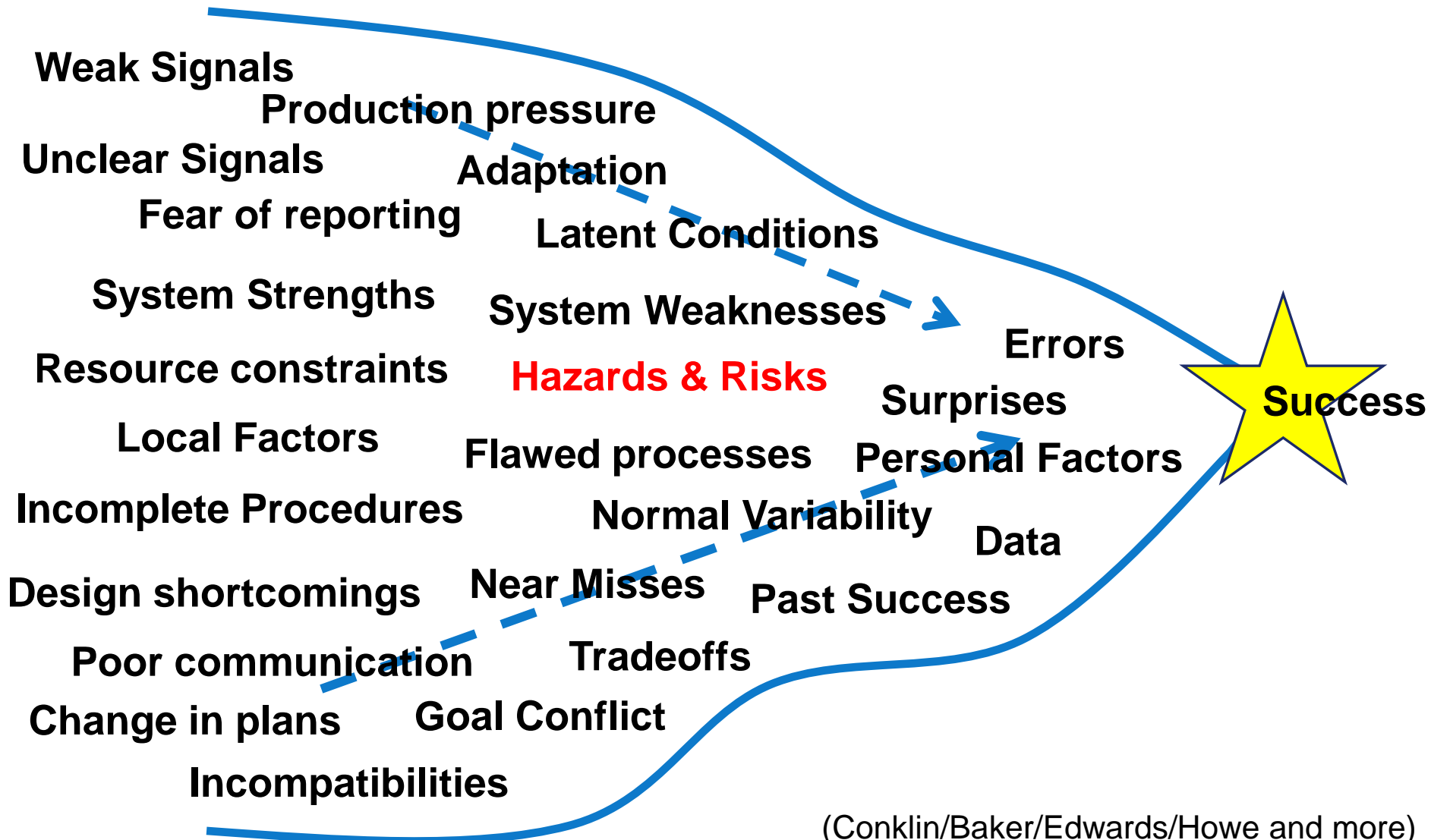
Start back in process . . .

. . . move towards the event

Weak Signals

Production pressure

Unclear Signals

Adaptation

Fear of reporting

Latent Conditions

System Strengths

System Weaknesses

Errors

Resource constraints

Hazards & Risks

Surprises

Event

Local Factors

Flawed processes

Personal Factors

Incomplete Procedures

Normal Variability

Data

Design shortcomings

Near Misses

Past Success

No Surprise!

Poor communication

Tradeoffs

Change in plans

Goal Conflict

Incompatibilities

(Conklin/Baker/Edwards/Howe and more)

Difference between Failure and Success?

Start back in process . . .

. . . move towards the event

Weak Signals

Production pressure

Unclear Signals

Adaptation

Fear of reporting

Latent Conditions

System Strengths

System Weaknesses

Errors

Resource constraints

Hazards & Risks

Surprises

Local Factors

Flawed processes

Personal Factors

Incomplete Procedures

Normal Variability

Data

Design shortcomings

Near Misses

Past Success

Poor communication

Tradeoffs

Change in plans

Goal Conflict

Incompatibilities

Success

(Conklin/Baker/Edwards/Howe and more)
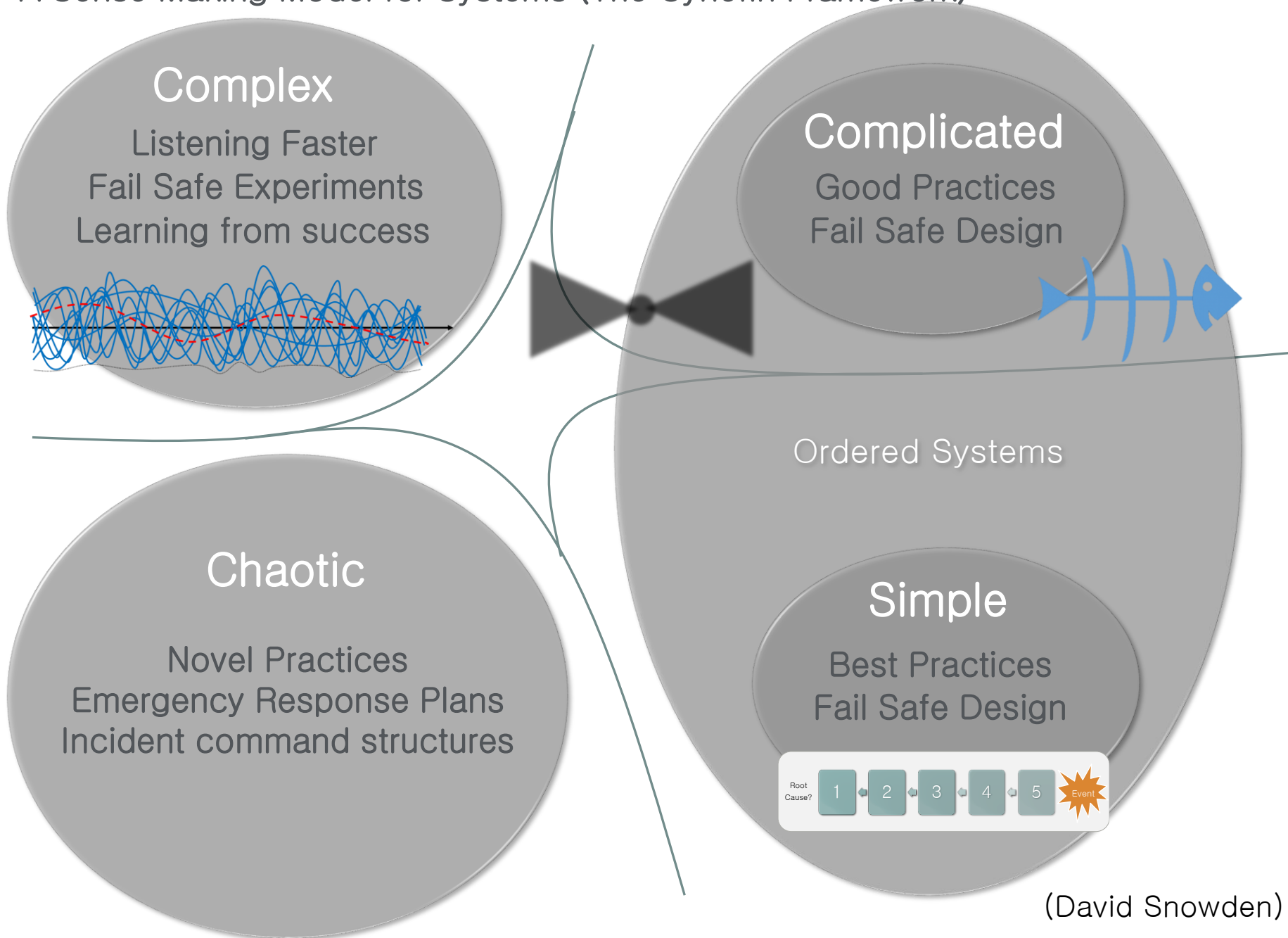
Success

~~Failure~~ is a combination of normal variability
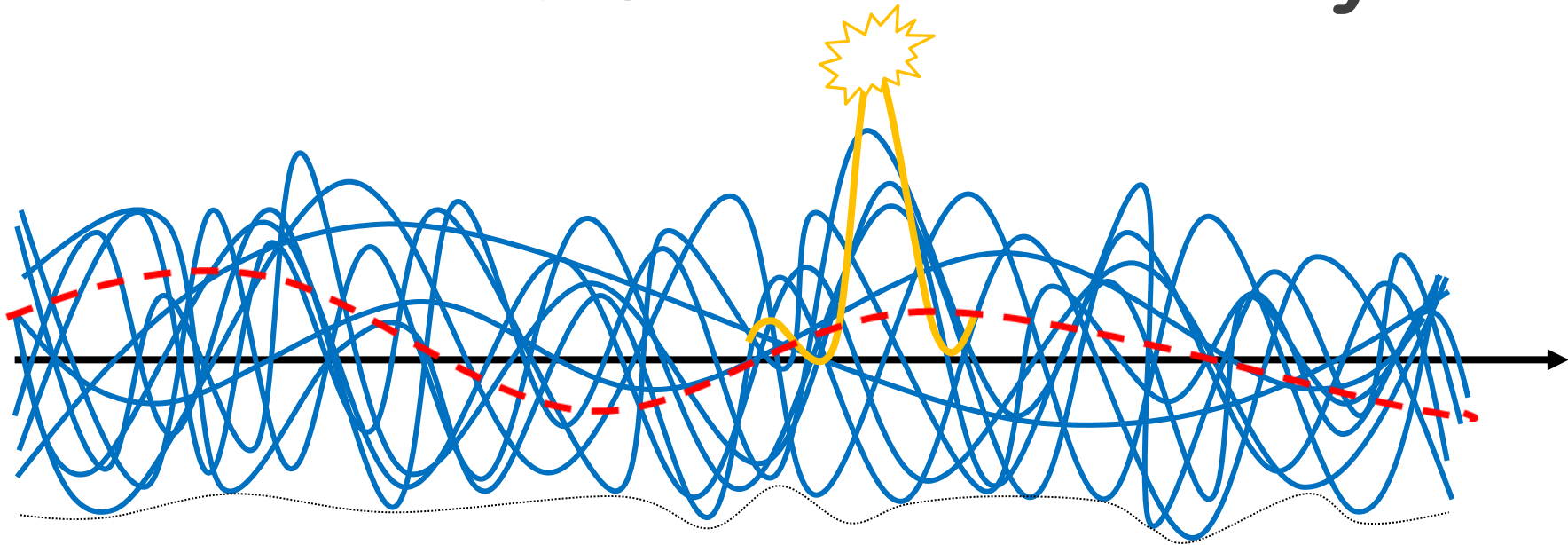
(Hollnagel, Conklin, Edwards, Baker)

A Sense Making Model for Systems (The Cynefin Framework)

Complex

Listening Faster
Fail Safe Experiments
Learning from success

Complicated

Good Practices
Fail Safe Design

Ordered Systems

Chaotic

Novel Practices
Emergency Response Plans
Incident command structures

Simple

Best Practices
Fail Safe Design

Root Cause? 1 2 3 4 5 Event

(David Snowden)

If we want **better answers** and a deeper understanding. . .

we have to **ask better questions!**

(Conklin, Edwards)

Expand the question from "**why did you do that?**" . . .

. . . to "**how do we normally do this work?**"

(Conklin)

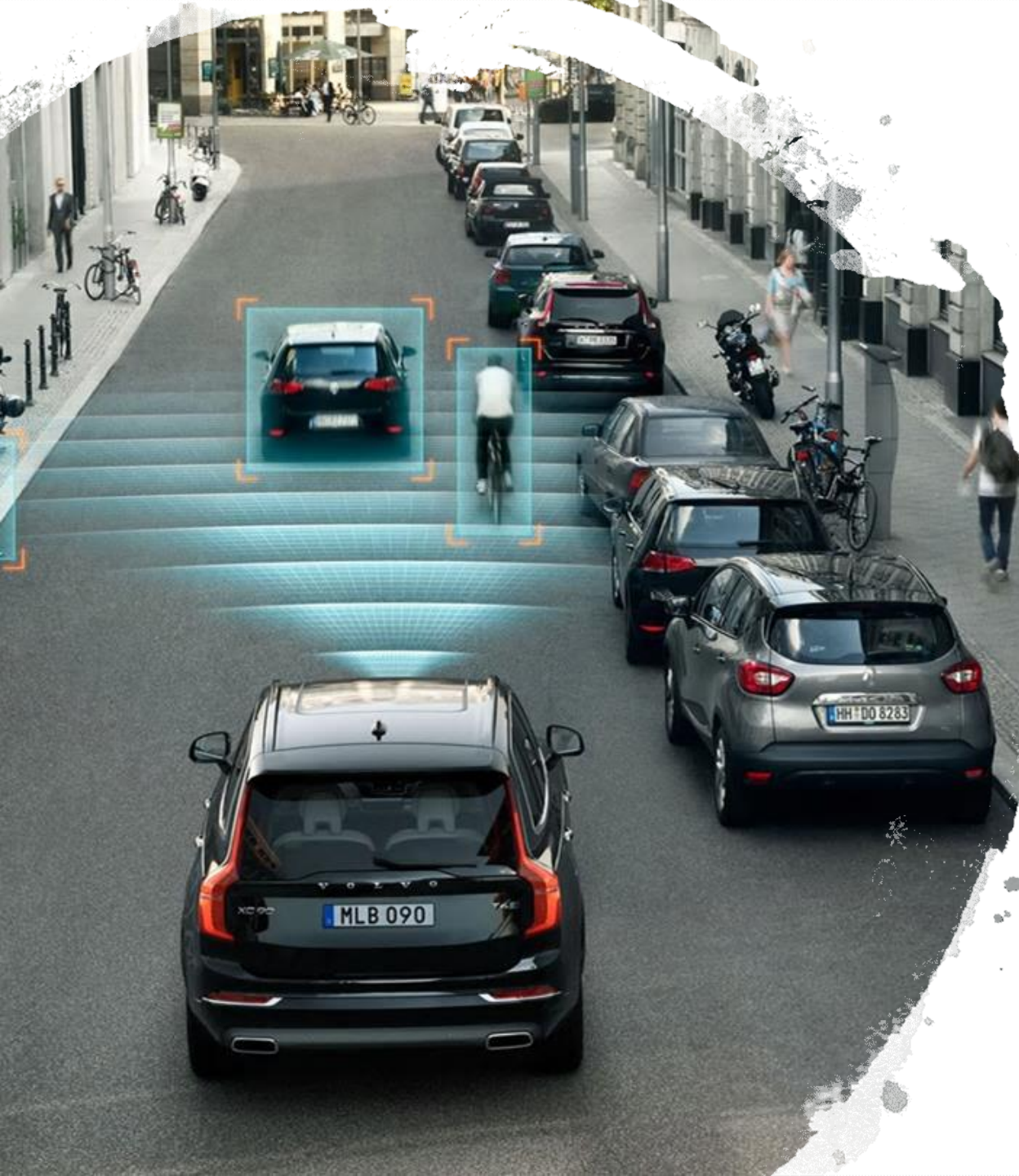*Let's learn and improve . . .*

. . . and build more capacity

The things people think and talk about, what they discover and learn, are implicit in the very first questions asked. Questions are never neutral, they are fateful.
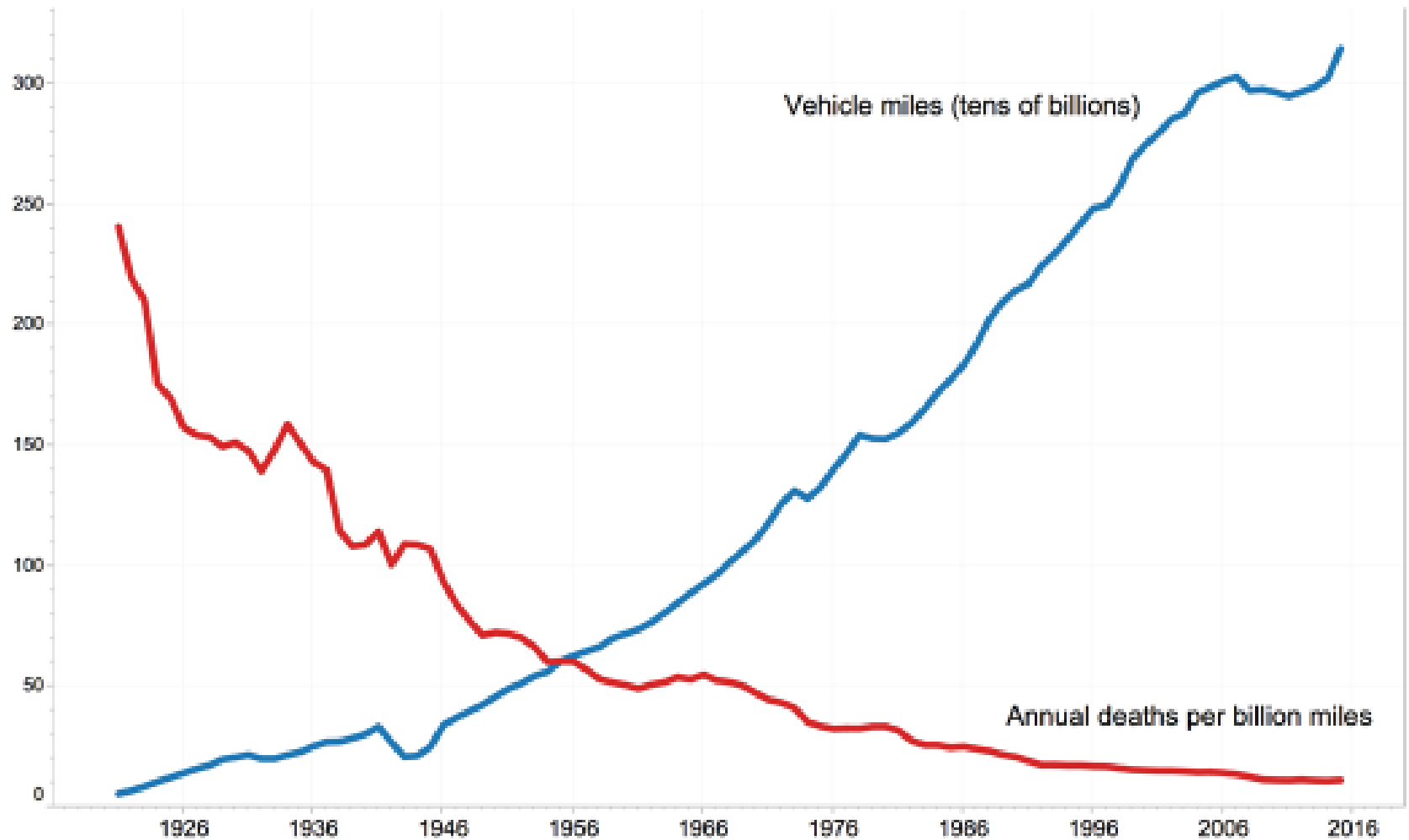
(David Cooperrider, Suresh Srivastva, 1987)

Hard to crash
& safe to crash

Great performance is not the absence of errors⋯

⋯ it's the presence of capacity

(Conklin)

US vehicle miles travels and proportionate fatality rates

Vehicle miles (tens of billions)

Annual deaths per billion miles

Defenses

- Types of Defenses

- Strength of Defenses

- Layers of Defense

- Sustainability of Defenses

Hierarchy of Controls??

- Elimination

- Substitution

- Engineering Controls

- Administrative Controls

- PPE

More focused on ownership and effectiveness.

Procedures are important…

But they are **not sufficient** enough to create safety

Our organizations have become complex-webs of **procedures** that are **incomplete and difficult.** (Conklin)

What does this mean?

The whiteboard will be clean every Friday afternoon

Request?

Fact?

Threat?

Promise?

If you want **great procedures**,

Have those who have to use them,
help you **write them.**

Strength of Defenses

Caution!

All railings are decorative.

Do Not Sit or Lean!

WiFi 4G LTE 36°F 3:4

Warning

Taking your eyes off the road too long or too often could cause a crash resulting in injury or death to you or others. Focus your attention on driving.

OK   Language

Critical Steps

Documented Procedural Steps

All Steps and Tasks

CRITICAL STEPS
- **Non-recoverable**
- **Must be done correctly**
- **Need Essential Controls**

Essential controls must be in place around the conditions that must be satisfied in order to prevent catastrophe after the critical step.

Main chute fails to open 0.1%

Fatality rate 0.001%

Source: www.uspa.org

Reliability & Resilience

Aug 7, 2015. DL1889 Boston to Salt Lake.

Emergency landing in Denver

Air Canada:
"In the go-around, Air Canada 759."

Air Canada
Flt. 759

↕ 51 ft.

Philippine Airlines
Flt. 115

The Mercury News
EAST BAY TIMES

Response to this message

When we believe we know the answer . . .

. . . we stop asking questions
. . . we stop listening
. . . we stop learning!

The power to ask the right questions . . .

. . . comes from acknowledging that you don't know the right answer.

The worker is not the problem to be solved . . .

. . . the worker is the problem solver.

Sterigenics

"I have never been especially impressed by the heroics of people convinced they are about to change the world. I am more awed by those who struggle to make one small difference."

(Ellen Goodman)

Resources

www.hophub.org
www.hopcommunity.org
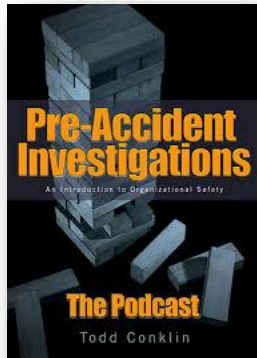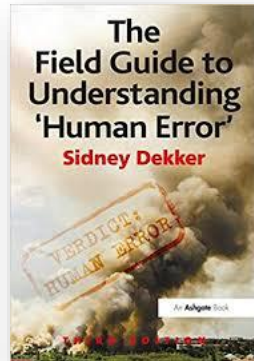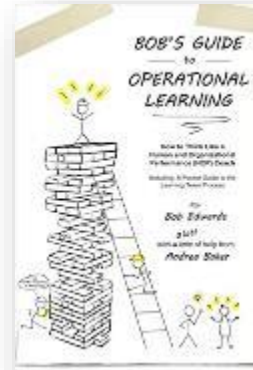
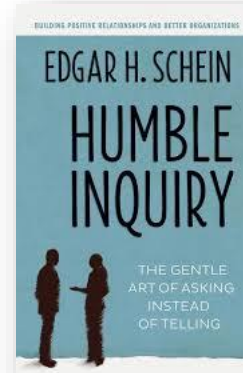Todd Conklin, PhD

Sidney Dekker, PhD
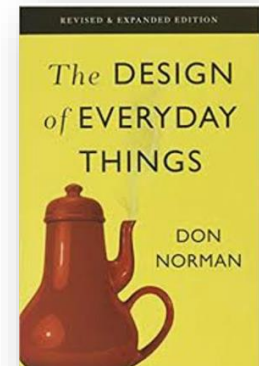
Bob Edwards
Andrea Baker
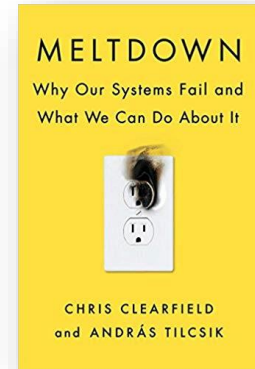
Chris Clearfield
Andras Tilcsik

Weick & Sutcliffe
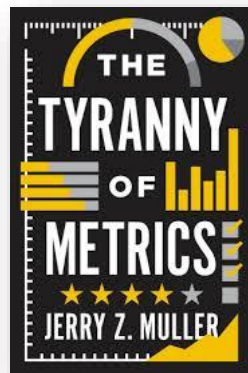
Jerry Muller

Edgar Schein, PhD

Don Norman

Learn and Improve. . .

Operational Learning
Human & Organizational Performance (H.O.P.)

Bob Edwards

H.O.P. Foundational Beliefs

- ➢ Work is Complex
- ➢ People Make Mistakes
- ➢ Blame Wastes Resources
- ➢ Context Drives Behavior
- ➢ Learning & Improving is Vital
- ➢ Leader's Response Matters

What is Operational Learning?

Not a traditional investigation

Not worried about collusion

Not focused on the "one true story"

Not focused on the one "root cause?"

Not focused on blame

Tells the story of how work normally gets done.

Tells the story of complexity

Tells the story of normal variability and coupling

(Tells how the conditions lead to this type of event if an event brought the Learning Team together)

Ingredients for Operational Learning (including Learning Teams)

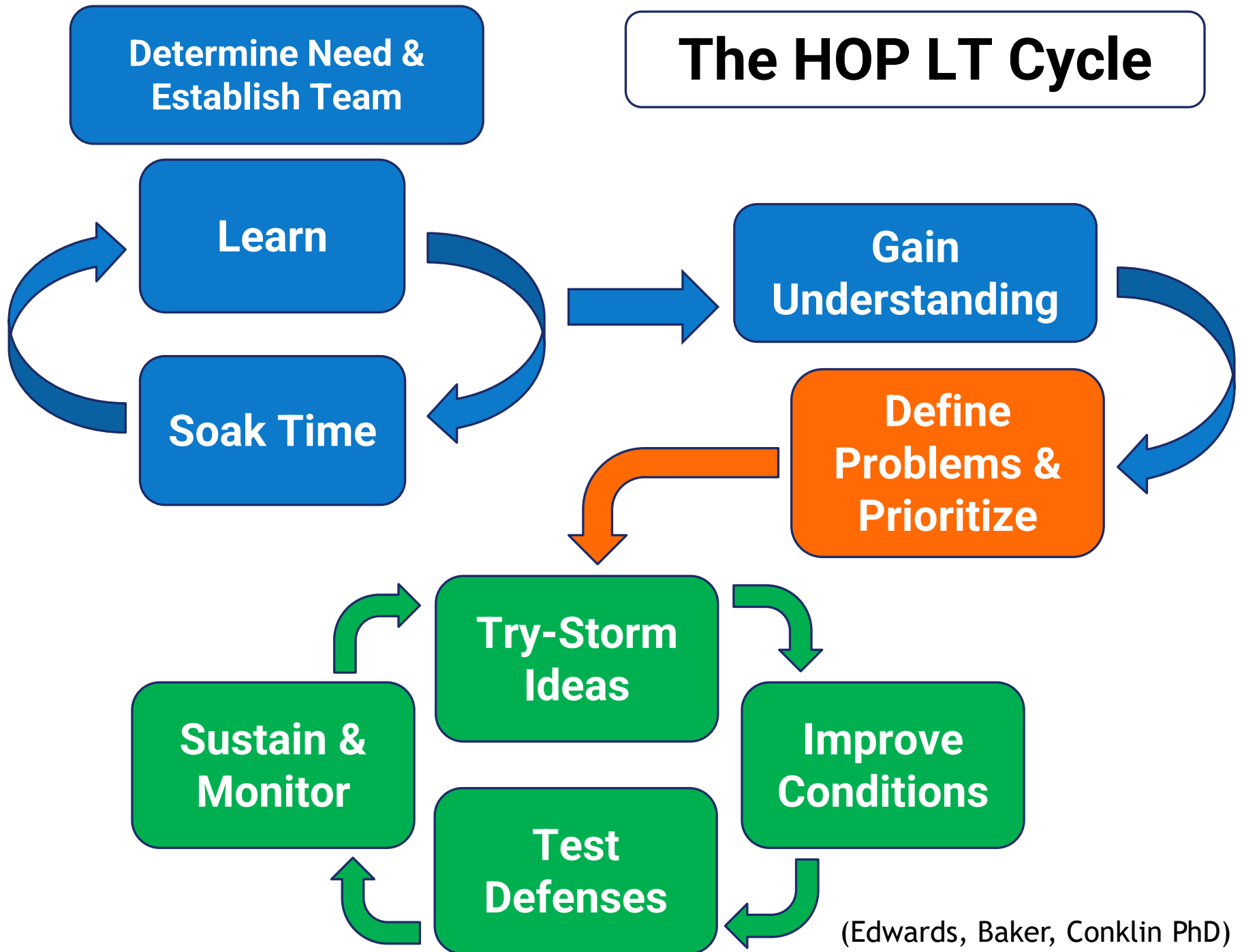Safe place to talk

Being teachable

Learning First

Valuing Soak Time

Defining the Problems

Team Generated Ideas

(Baker/Edwards)

The HOP LT Cycle

Determine Need & Establish Team

Learn

Soak Time

Gain Understanding

Define Problems & Prioritize

Try-Storm Ideas

Improve Conditions

Test Defenses

Sustain & Monitor

(Edwards, Baker, Conklin PhD)

The things people think and talk about, what they discover and learn, are implicit in the very first questions asked. Questions are never neutral, they are fateful.

If we want **better answers**
and a deeper understanding. . .

we have to **ask**
better questions!

(Conklin, Edwards)

Expand the question from "**why did you do that?**" . . .

. . . to "**how does work normally get done?**"

(Conklin, Edwards)

Oct 12, 1997 at 5:18 PM

John Denver dies in plane crash
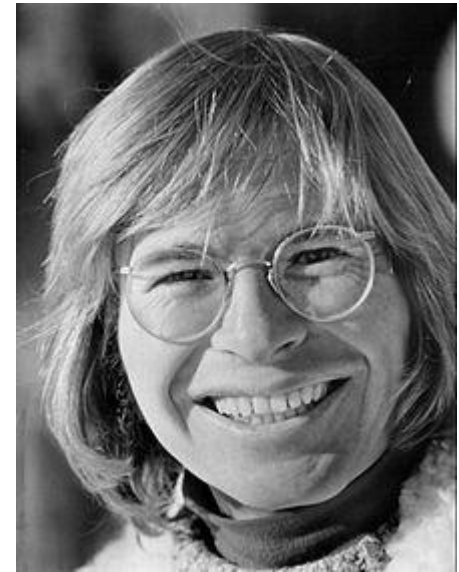
Failed to fill up tanks before flight

Did not put plane on auto-pilot

Hit right rudder pedal by accident

Pilot Error!

www.angelfire.com

20 years experience

2400 hours

Single / Multi / Aerobatic Bi-Planes / Lear Jet

Had flown it once for 30 minutes prior day

Quick one hour flight

Buzz neighbor's house.

Switch location / labeling

Operation (up=off / down = right / right = left)

Fuel gauge marking

Fuel consumption rate.

When?

- Not for everything (resources!!)
- Based on severity (or potential)
- Post-event (Injury/Quality/Operations)
- Near Miss or Close Call
- Good Catch
- Interesting Successes
- High Risk Operations
- Challenging Design Problems
- Not for determining punishment
- Not for criminal behavior.

Everybody knows . . .

DOOR
AJAR

Audible Alarm

DOOR
AJAR
It shows you which one...
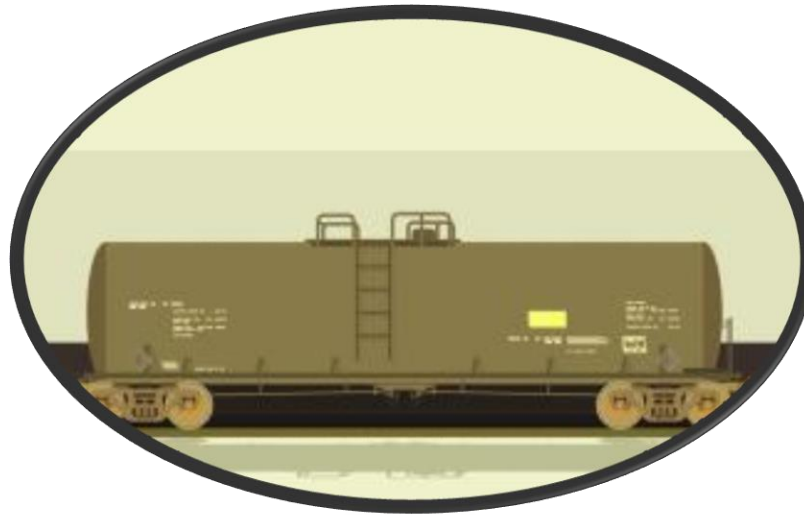
Learning Team Make-up

- Coach or Facilitator (and co-facilitator)
- Small enough to manage but large enough to capture the context (i.e. 5 – 7ish)
- Those close to the event or issue
- Possibly someone from outside the process
- Support members as needed
- Leadership to sponsor it and kick it off (they may or may not be able to stay, depends. If you are not sure, have them step out)

Industrial Empathy

*"Our goal is to learn enough that we realize, given the **conditions** they faced and the **information** they had, the **tools and equipment** they used and the **pressure** they were under, that we would probably have made the same decision."*

(Edwards/Baker)

Intersection

Break Room

STOP

STOP

STOP

STOP

The HOP LT Cycle

Determine Need & Establish Team

Learn

Soak Time

Gain Understanding

Define Problems & Prioritize

Try-Storm Ideas

Improve Conditions

Test Defenses

Sustain & Monitor
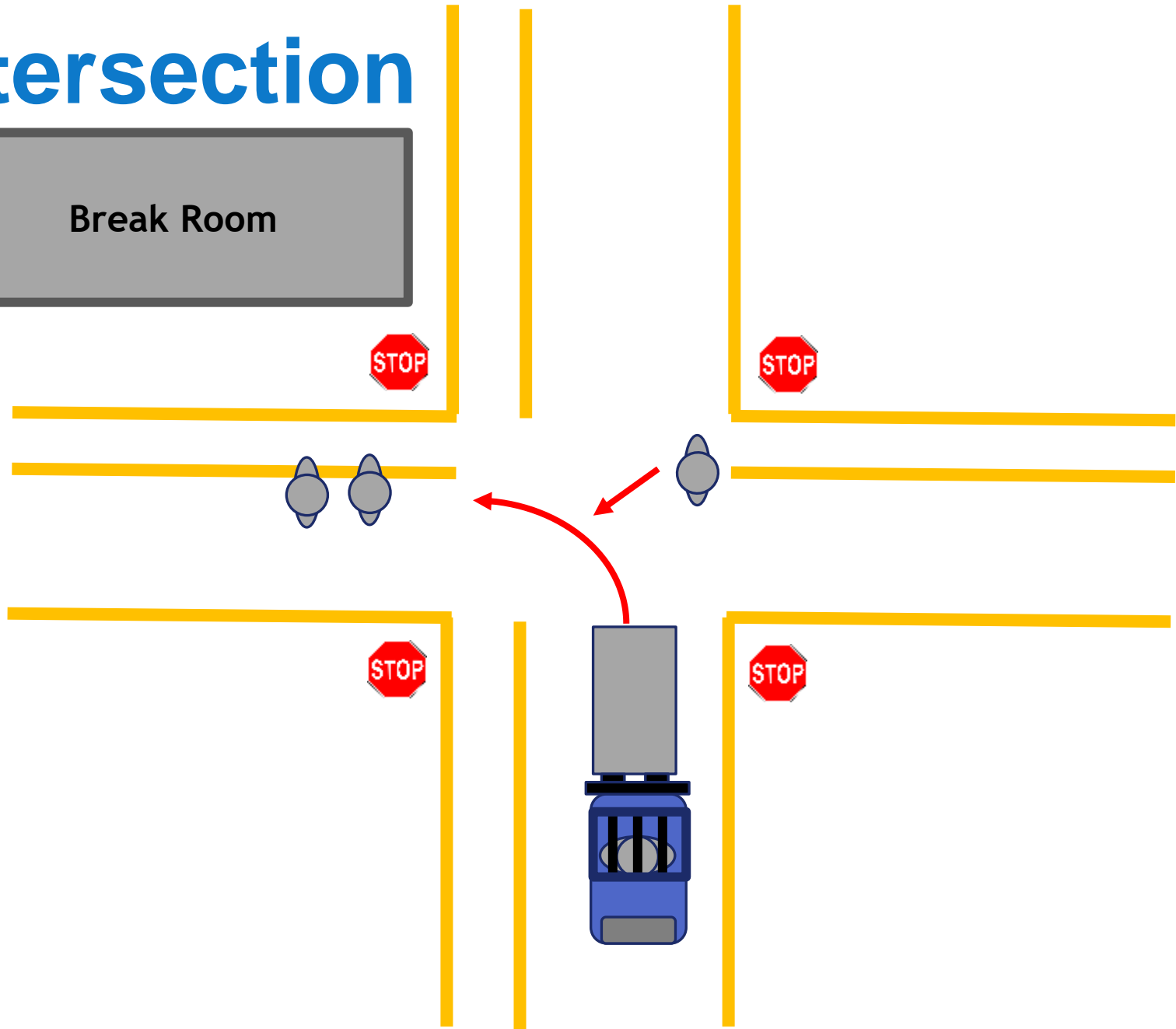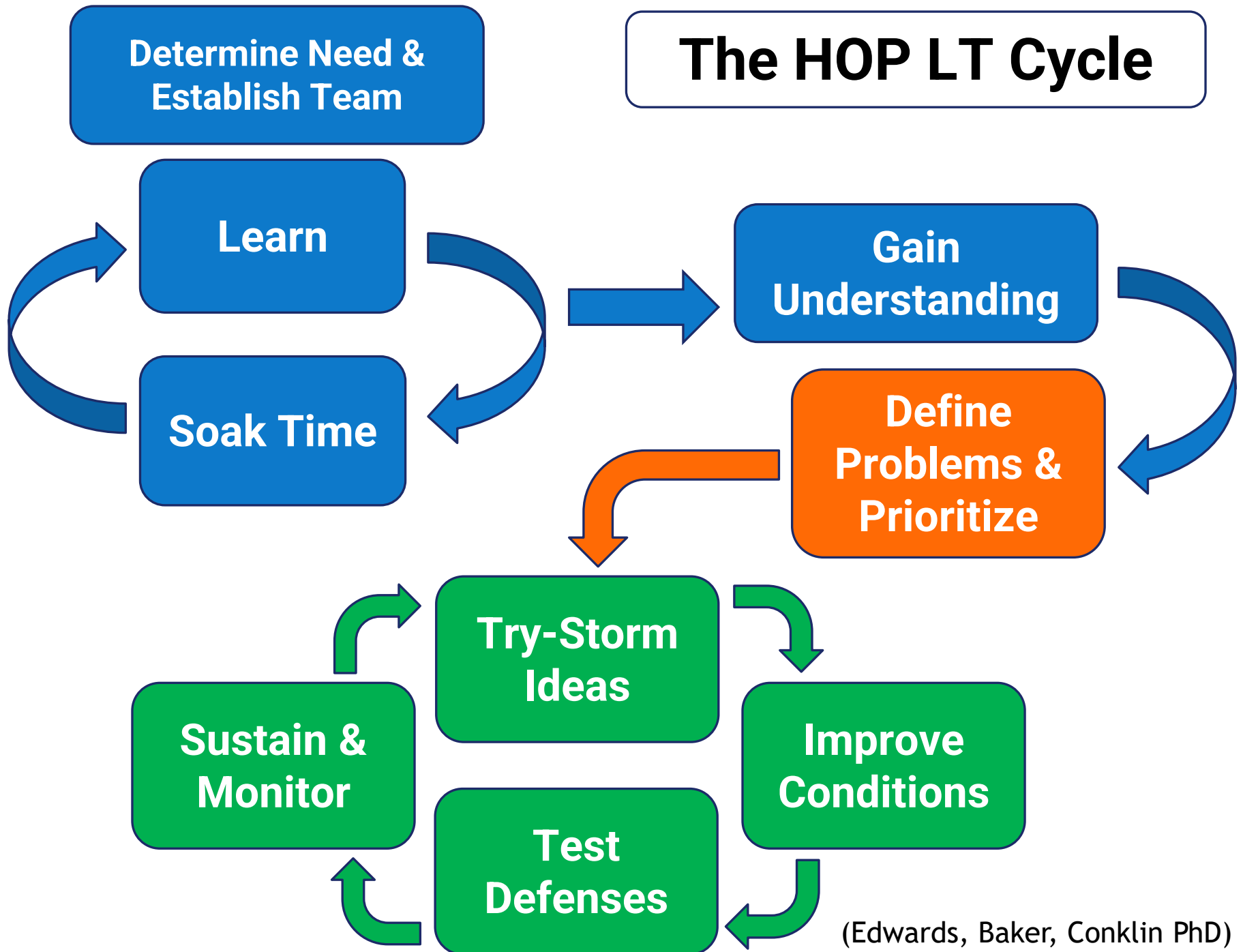
(Edwards, Baker, Conklin PhD)

Soak Time Tips

Ülepedési idô

- At least overnight (if at all possible)
- **Allows time to process learnings**
- Allows time to go look
- **Allows the coach time to think of additional questions.**

einveichzeit

tiempo para reflexionar

soako

הפנמה - Hafnama

Circle of control

Circle of Influence

Circle of Concern

Micro-experiment

Try your own ideas
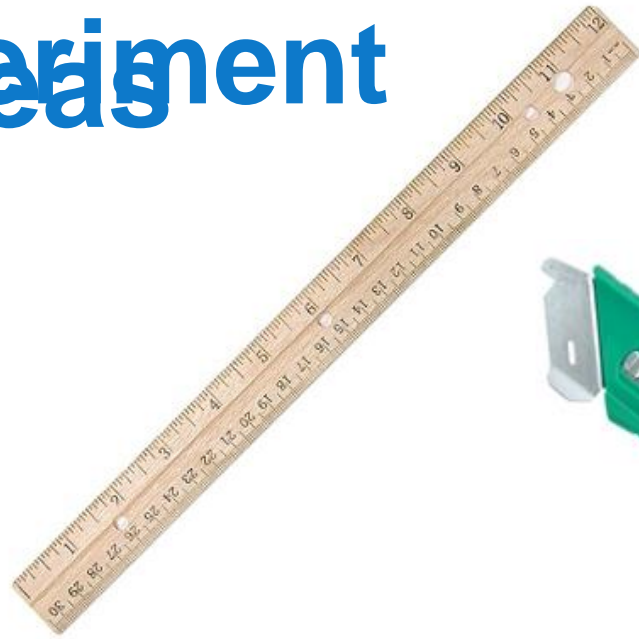
Be completely present with the Learning Team.

Coaching Learning Teams

- Be a coach (Take off your safety hat)
- Co-coach (Builds capacity and helps a lot)
- Good listener (Everyone can't be a coach!)
- Be curious (. . . and then be quiet)
- Nonjudgmental (or at least act like it)
- Open minded (You may not always like what you hear)
- Engaging (Value everyone's input)
- Street credibility (Basic process knowledge helps)
- Encourage (Let them figure it out)
- Be interested in helping tell the blue line story
- Don't be afraid to tell the real "blue line" story.

Seek out differing opinions . . .

The HOP LT Cycle

Determine Need & Establish Team

Learn

Gain Understanding

Soak

Tell the Learning Team Story

Sustain & Monitor

Improve Conditions

Test Defenses

(Edwards, Baker, Conklin PhD)
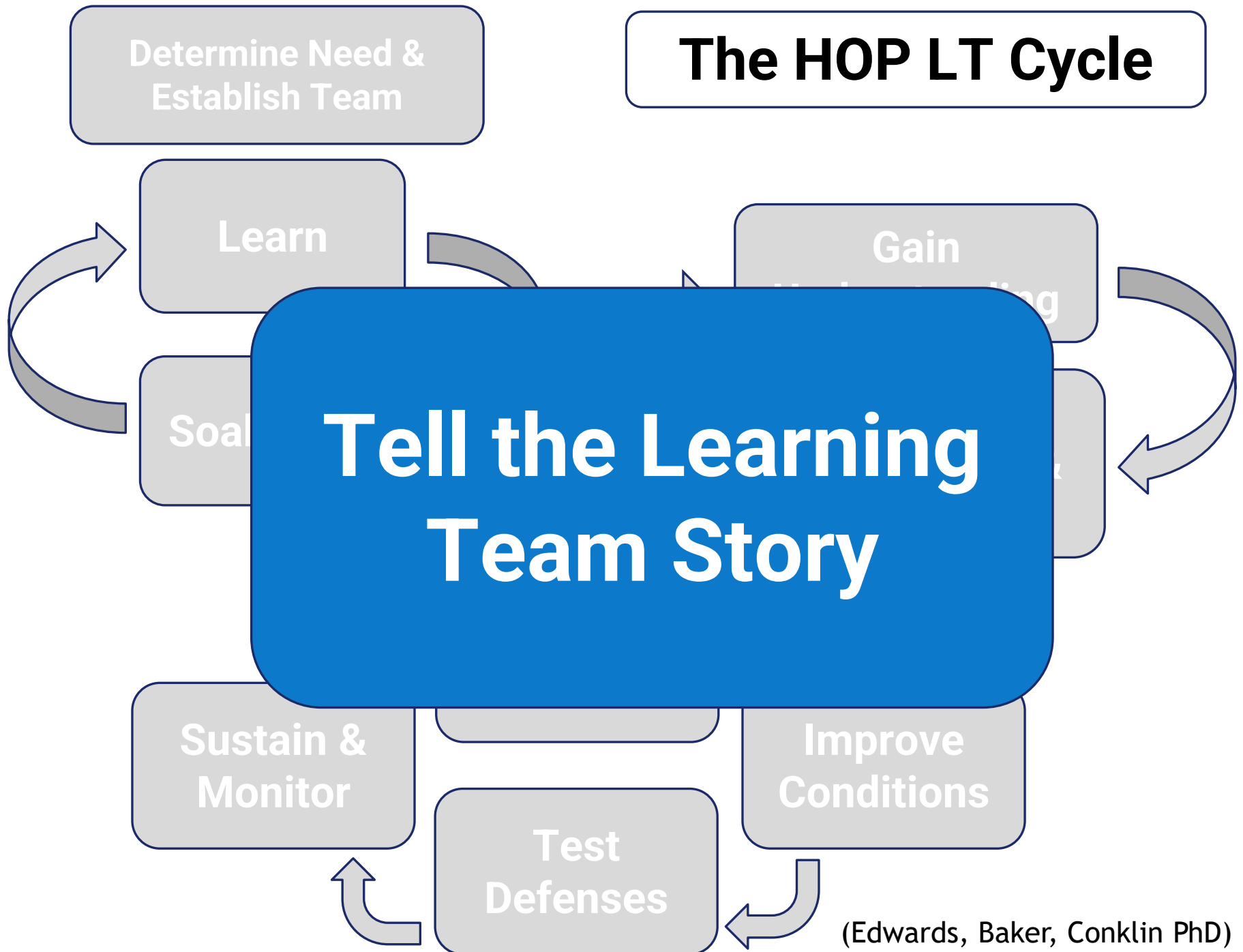
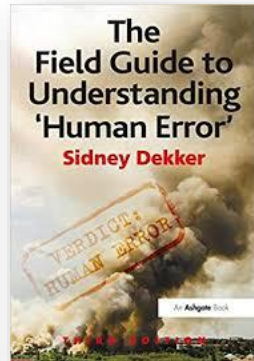It's hardly ever a safety problem . . .
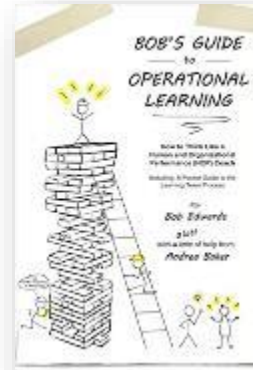
It's usually an operational problem!
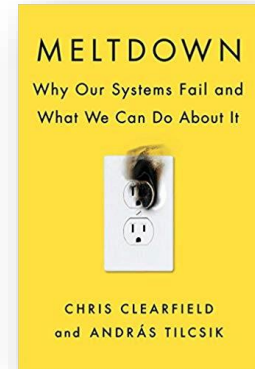
Resources

www.hophub.org
www.hopcommunity.org
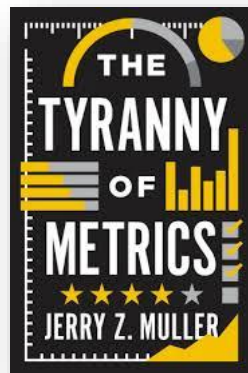
Todd Conklin, PhD
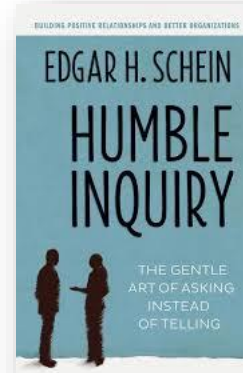
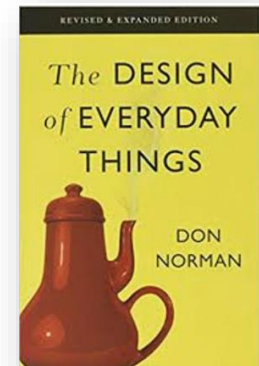Sidney Dekker, PhD

Bob Edwards
Andrea Baker

Chris Clearfield
Andras Tilcsik

Weick & Sutcliffe

Jerry Muller

Edgar Schein, PhD

Don Norman