

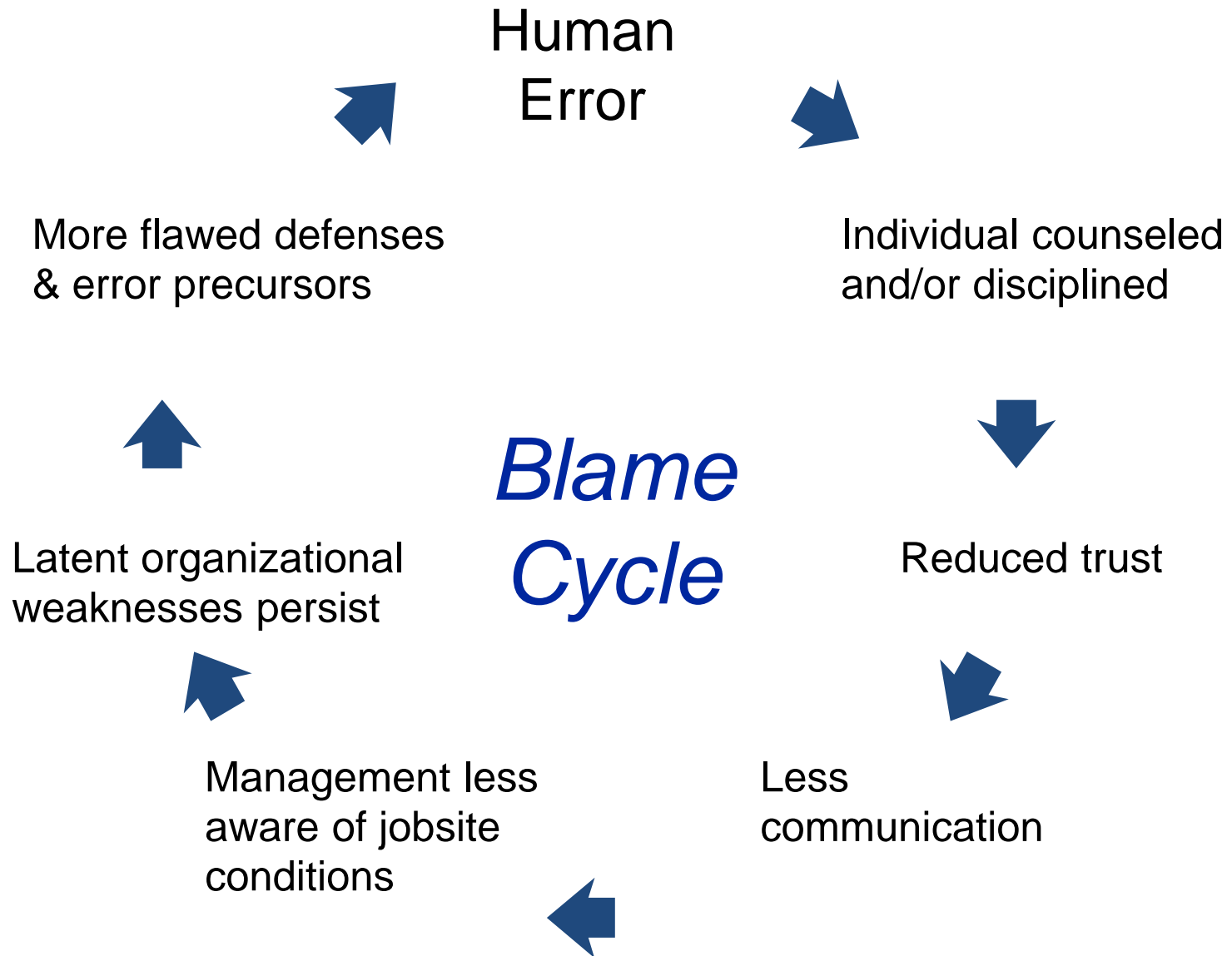
# Understanding Human Error and Improving Human Performance

**Borkowski & Associates, LLC**

*Helping Individuals and Organizations Achieve Their Full Potential*

# Facts about Human Error

- It thrives in every industry
- It is a major contributor to events and unwanted outcomes
- It is costly, adverse to safety and hinders productivity
- The greatest cause of human error is weaknesses in the organization, not lack of skill or knowledge
- Error rates can never be reduced to zero
- Consequences of errors can be eliminated



*New From Award Winning Author Tony Kern*

EMPOWERED

# BLUE THREAT

WHY TO ERR IS  
**INHUMAN**

— HOW TO WAGE AND WIN —  
THE BATTLE WITHIN

*"Kern's 'empowered accountability' approach is the first  
major human performance breakthrough in decades."*

— John Nance, Author and TV News Analyst

TONY KERN

RESPONSIBLE

IMPROVING

ACCOUNTABLE

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# Human Error Lesson #1

Things that have  
never happened before,  
**HAPPEN ALL THE TIME!**

# Brian Peacock



# Human Error Lesson #2

Anything less than  
a conscious commitment  
to understanding and reducing  
personal error  
is an unconscious commitment to  
accepting their continuing presence  
and all future consequences

# Dawn Ewing



- 32 Years Old
- Engaged to be married
- Safety Committee Person
- March 5, 1998
- 12:20 p.m.



**Life is not something  
that happens to you,  
you are something that shapes  
the present and future  
of your personal and  
professional life.**

# You intentionally and mindfully create your future by:

- Systematically structuring and learning from experience
- Mindfully living in the present
- Deflecting violation and error-producing conditions
- Seeing and seizing new opportunities in real time

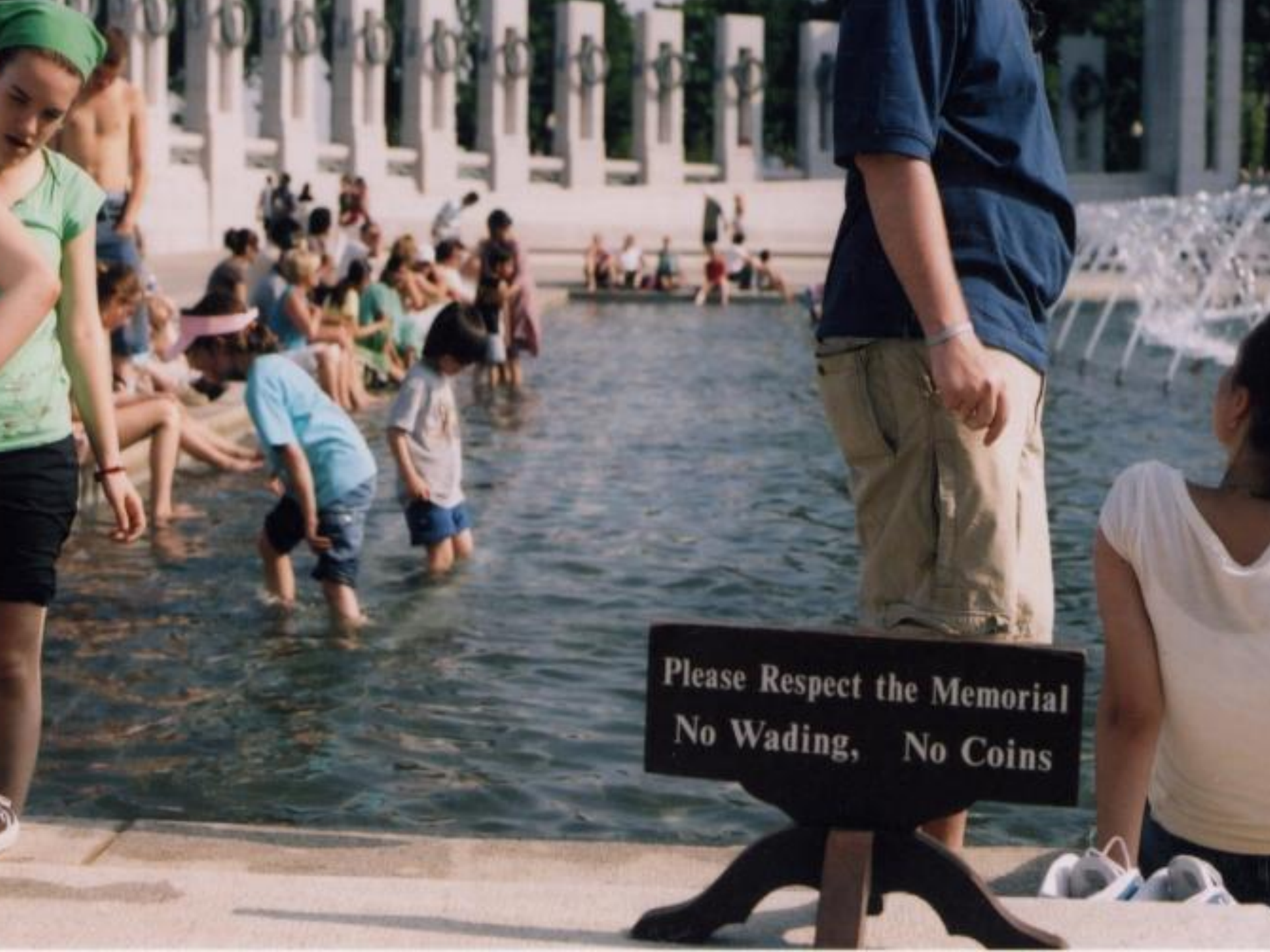
# Thereby creating the future you both intend and deserve.

# Some Things To Remember

- 90% of Events are Caused by Something **OTHER THAN JUST** the Individual
- 95% of People Respond Similarly to the Same Stimuli
- Human Performance is NOT Common Sense
- People Do What They Do, At the Time They Do It, For Reasons that Make Sense to Them at The Time.

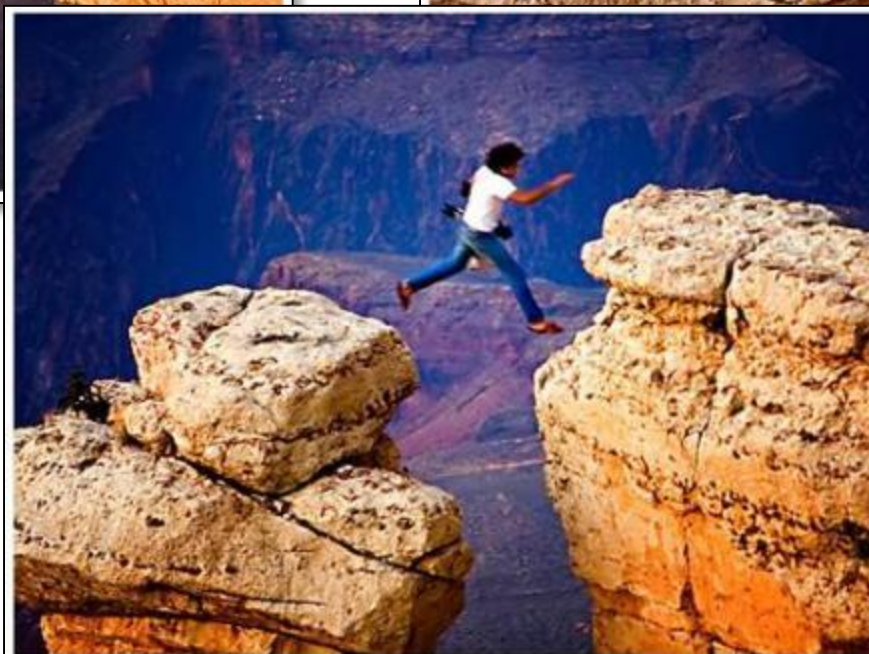
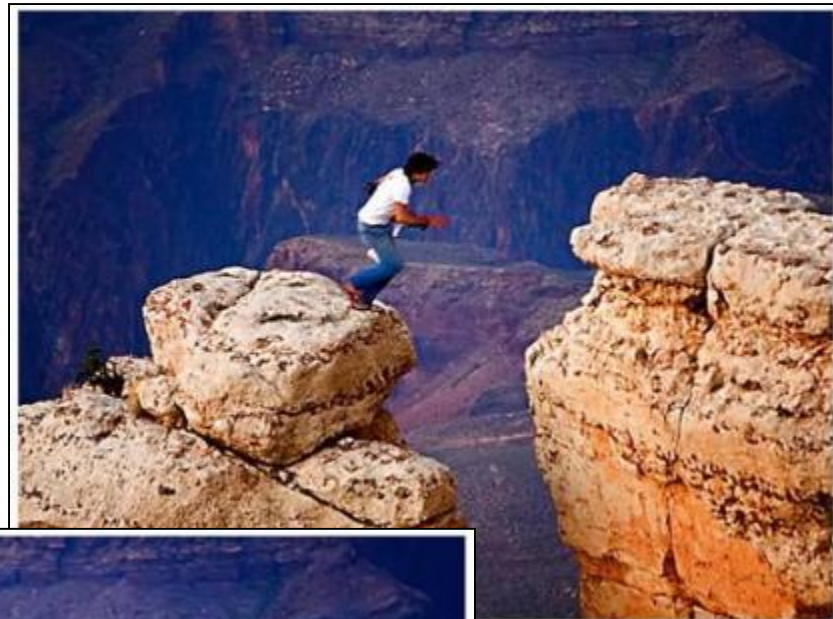






Please Respect the Memorial  
No Wading, No Coins





**Associates, LLC**  
*Achieve Their Full Potential*





# Devil's Kitchen

- Middle aged adult male, educated and experienced in the outdoors.
- Ignored signs, hiked around barricade, broke through crust
- Circumferential 3<sup>rd</sup> degree burns to lower extremity
- Emergency evacuation
- Weekly doctor visits





# Devil's Kitchen

On interview victim stated:

**“I thought the signs were  
for liability, not actual  
danger.”**



**CAUTION: The ground near hydrothermal area is thin, brittle, and slippery. To avoid breaking through and being severely burned, stay on established trails and boardwalks at all times.**



# Guiding Principles

- Organizational values influence individual behaviors
- Recognition that **People are fallible...**
- Error-likely situations are **predictable** and preventable
- Performance is based on reinforcement and self-motivation
- Events can be avoided by understanding **causes** and applying lessons learned

# Performance Modes

## Skill Based

Execute from memory without significant conscious thought or little attention

Test:

Can Person carry on a conversation while performing the task?

## Rule Based

Based on the selection of stored rules derived from one's experience or from a procedure.

Test:

Is the person using IF (symptom X), THEN (situation Y) logic either using a procedure or by conscious mental thought

## Knowledge Based

Person relies on their understanding and knowledge of the system and scientific principles and fundamental theory related to the system to develop a response.

Test:

Is this an unfamiliar situation? (no skill or rule recognizable by the individual)

# Which Performance Mode Do You Want To Operate In?



# WE ARE HIRED TO DO AN OCCUPATION

OPERATOR-MECHANIC-MOBILE EQUIPMENT OPERATOR-WELDER

THESE OCCUPATIONS REQUIRE  
US TO DO JOBS

DRIVE MOBILE EQUIPMENT,  
PERFORM LOCK-OUT-TAG-OUT  
OPERATE EQUIPMENT, WELD

THESE JOBS  
CONTAIN TASKS

LOCK-OUT-  
TAG-OUT THIS  
PUMP

DRIVE FORK LIFT  
INTO THIS TIGHT  
PLACE TO HANDLE  
THIS LOAD THIS WAY

THESE TASKS  
CONTAIN  
ACTIONS (STEPS)

HANG LOCKS  
ON EACH  
ELECTRICAL  
SUPPLY

HANG LOCKS  
ON EACH  
WATER SUPPLY

LIFT LOAD  
UP TO SEE  
TIGHT  
SPACE

LOAD  
GOES INTO  
AREA IN  
TRUCK

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# Top 10 Error Traps

- Stress
- Multi-tasking/High work load
- Time pressure



**All Feel the Same**

- Poor communications
- Vague/poor written guidance
- Overconfidence
- Infrequent or first time task



**Put us in or keep us in Knowledge Based Mode**

- Distractions
- First working day following time off > 4 days
- The end of a shift or extended shift



**Interact With Other Traps**

# Human Error Reduction Tools

- Pre-Task Brief
- Questioning Attitude
- Pause When Unsure – Seek Out Help
- Three-Way Communication
- Place Keeping
- STAR: Stop, Think, Act, Review

# ***What We've Learned About***

## **Fatalities**

### **and Other Low Probability High Consequence Events**

- Have multiple causes
- Surface at different locations
- At times seem hard to predict and foresee
- Involve many people operating at different levels
- Involve gaps in work environment, work method, organization, equipment/process and individual defenses
- Know no boundaries, often showing up where we least expect
  - Including locations with low TRIR and strong fatality prevention programs*
  - Everyone should believe they are vulnerable*
- Magnify latent conditions that went undetected
- Often point out lessons from our past that we have not applied or institutionalized
- Often result from simple deviations from safe work practices that often became normalized

***....almost always involve some gap in leadership!***  
***Even if that gap is temporary!***

*Adapted from James Reason's Managing the Risk of Organizational Accidents*



# ***What was holding us back?***

- **Over-confidence is fueled by one's past success.**
  - A good TRIR creates a perceived “comfort zone” that risk is in control
  - Often, there is no plan for identifying and managing the “high” risks – daily
  - Misses the “changes in conditions, boundary issues or non-routine work”
- **Tendency to view people as a constant vs. biggest variable in the “Safety Equation”.**
  - ability to recognize hazards and perception of risk
  - the choices they make and actions they take
- **The tolerance of contracted services risk is extremely high and the oversight is weak.**
- **Follow-up often stops short of pursuing the systemic drivers of individual deviation.**
- **Mismatch between resource capabilities and the magnitude of the challenge.**
- **Reliance on single-layers of protection where the risk is high, deviation potential is high and ability to test and verify is low.**
- **Supervision with a widening span of control.**
  - Supervisor to crew ratio
  - Less available time for direct-in-the field supervision of new to job employees
  - Less available time for coaching and verification

# ***Fatality Prevention***

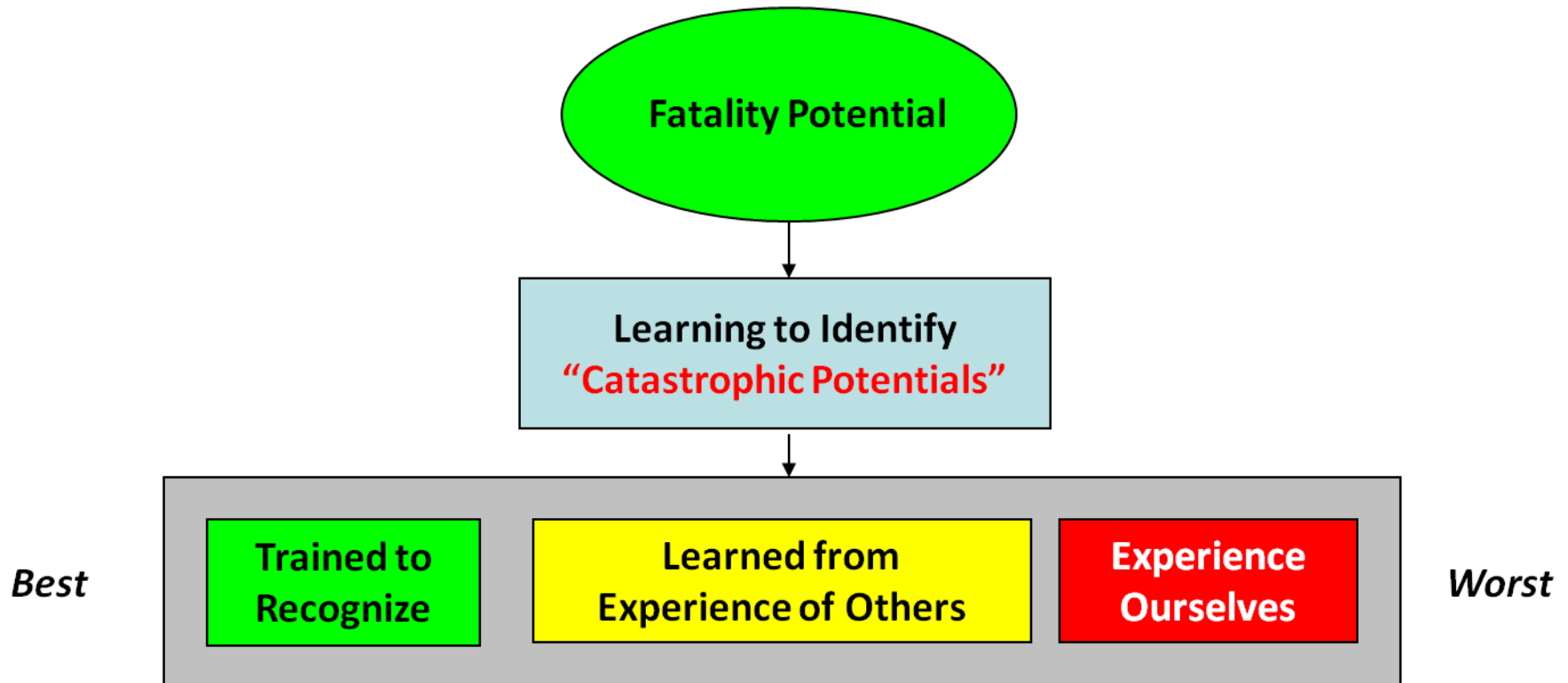
## **Starts With Leadership**

***Senior Line Leadership is Essential  
to Set the Tone for a Culture that Promotes***

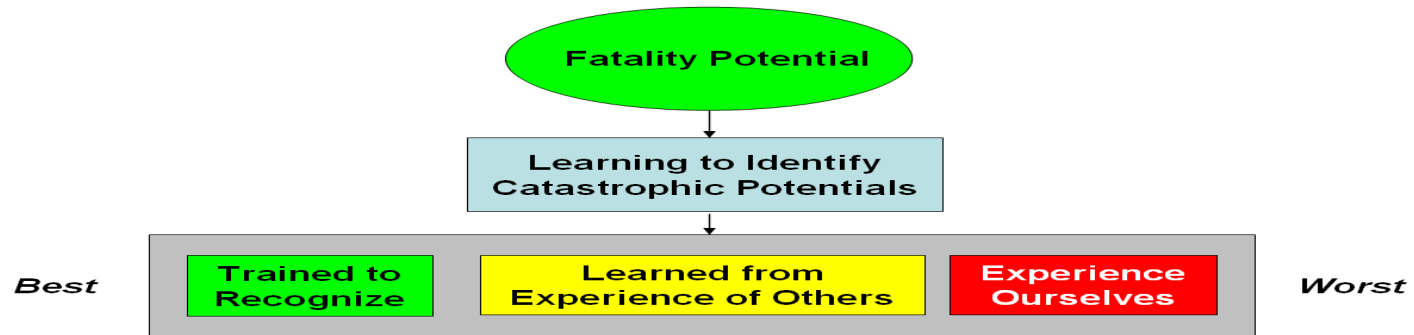
- ***Effective Communication***
- ***Proactive Hazard Recognition***
- ***Risk Assessment and Management***

***All Essential Building Blocks for Effective  
Fatality Prevention.***

# ***Leaders Need to be Aware of the Fatality Potential Within Their Sphere of Influence or Control.***



# Example - Applying Lessons Learned



A sustainable process must be in place to:

- **Pass on our Institutional Knowledge About Historical Fatalities to the Next Generation.**
- Review Major Incidents and other Injury Free Events with Fatality Potential
- Ensure Lessons Learned are Communicated
- Where Similar Risks Exist, Corrective Actions are Taken to Eliminate or Mitigate Those Potentials

**Mechanisms Used to Warn of Known High Risk, Low Probability Potentials Include but are not Limited to:**

- Project Environment, Health and Safety Reviews
- Work Permits Systems
- Pre-job Safety Plans
- Pre-job Briefings
- **Feedback associated with Field Observations!**

# ***Leaders Need a Process to Test and Reinforce a Culture that Manages the High Risk Exposures DAILY!***

- **Field Observations Allow Leadership to Test Reality** on the floor and helps identify where the organization is vulnerable.
  - Highlights when what's on paper doesn't match actual practice.
  - Informs us of the unexpected or non-routine that we did not expect or did not know existed.
- **Employee Contacts or Engagement**
  - Ensures employees participate in the identification of significant risks and what to do to protect against them.
  - Receives Major Incident communications and lesson's learned are applied at the floor level.
  - Ensures employees participate in High Risk Task of the Day dialogues, work permits, pre-job safety plans and pre-job briefings.
- **Process Safety Reviews and Management of Change**
  - Identifies potential sources of accidental releases and safety incidents with the potential for catastrophic consequences.
  - Ensures maintenance materials, and spare parts are fabricated and installed consistent with design specifications.
  - Maintains systems for critical process-related equipment, procedures, training, inspections, and testing to ensure ongoing mechanical integrity.
  - Completed for all newly installed or modified processes or equipment.

# Field Involvement & Observation Are Effective in Error Prevention

- With good observation techniques, **70-85%** of individual human errors can be identified by a co-worker or supervisors.
- About **60-70%** of the latent conditions or other causes can be effectively identified and corrected by **Supervisors** before the human errors are made.

***People Are The Greatest Single Variable***

**Don't wait for  
the perfect  
moment.**



**Do not let what you  
cannot do interfere  
with what you can  
do.**



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