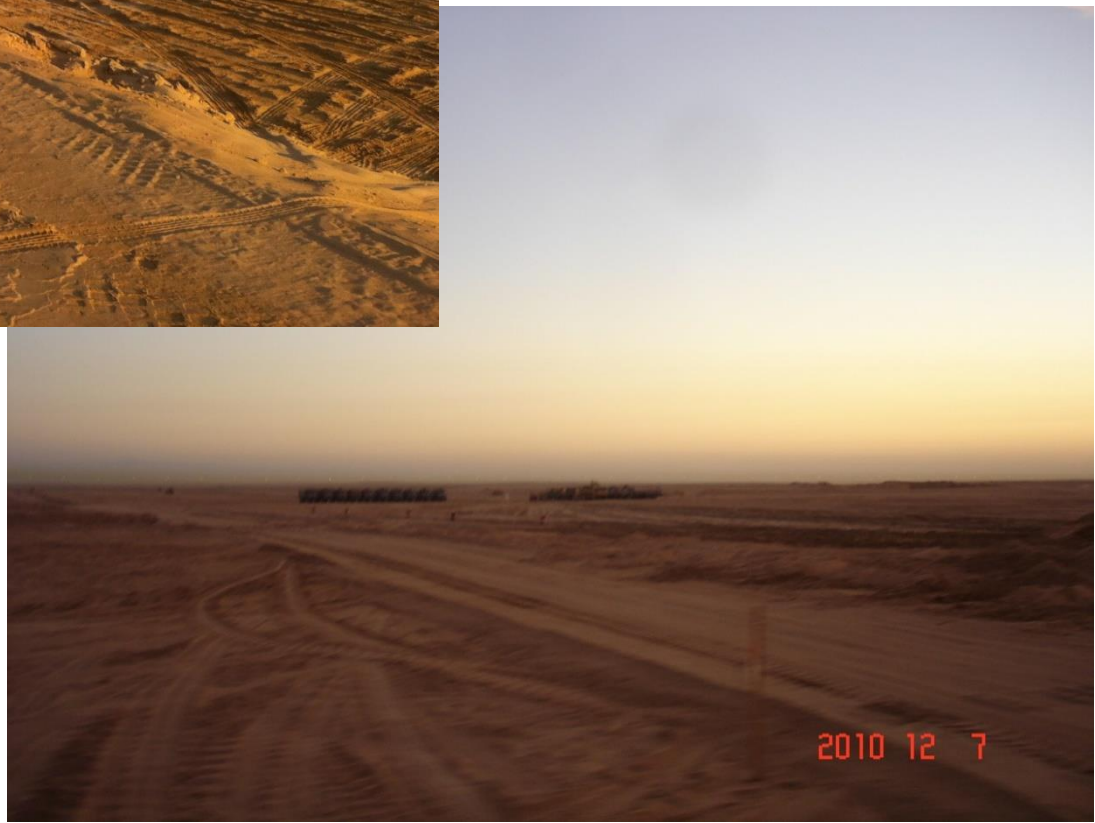
Steve Borkowski

About Steve

STRENGTHS	POTENTIAL LIMITERS
↘ Optimistic	↘ Impatient
↘ High paced	↘ Find it hard to say no
↘ Likes people	↘ Disorganized

Ukraine
Slovakia
Bratislava
Austria
Hungary
Moldova
Dnepropetrovsk
Дніпропетровськ
Zagreb
Romania
Odessa
Одеса
Croatia
Serbia
Bucharest
Black Sea
Italy
Rome
Bulgaria
Georgia
Caspian Sea
Istanbul
Ankara
Azerbaijan
Greece
İzmir
Turkey
Turkmen
Athens
Αθήνα
Antalya
Aleppo
حلب
Mosul
الموصل
Tehran
تهران
Ashgab
Syria
Mediterranean Sea
Lebanon
Esfahan
اصفهان
Afghanistan
Tripoli
طرابلس
Alexandria
الاسكندرية
Israel
Iraq
Basrah
البصرة
Iran
Jordan
Pakistan
Cairo
القاهرة
Libya
Egypt
Persian Gulf
Karachi
کراچی
United Arab
Emirates
Saudi Arabia
Jeddah
جده
Muscat
مسقط
Ahmedabad
Red Sea
Oman
Mumbai
Sudan
Chad
Eritrea
Sana'a
صنعاء
Yemen


2010 12 7

The largest, most efficient vertically integrated aluminum complex in the world

Bauxite Mine	Refinery	Smelter	Rolling Mill
			
■ Al Ba'itha mine ■ 4 MMT annually ■ 30+ years of reserves ■ Direct rail line to refinery	■ Located at Ras Az Zawr ■ 1.8 MMT annually ■ Designed for expansion	■ Co-located with Refinery at Ras Az Zawr ■ 740 KMT annually ■ Designed for expansion	■ Co-located with Smelter at Ras Az Zawr ■ Up to 460 KMT hot mill ■ Body, end and tab stock for aluminum cans

Preventing Fatalities and Serious Injuries

Strategies and Lessons Learned

What we know…

MOST FATALITIES:

- **Occur rarely**
- **Have multiple causes**
- **Surface at different locations and times**

- **Seem hard to predict and foresee**
- **Involve many people operating at different levels**

- **Involve a breech of human-technical-organizational defenses**
- **Know no boundaries, showing up where we least expect.**

- **Magnify latent conditions that went undetected**
- **Institutional lessons from out past that we have not applied.**
- **Simple deviations from safe work practices that often became normalized.**

What we know…

"Organizational Norms" can increase the fatality risk, for example when:

- **Safety not viewed as a line responsibility as a result safety lacks ownership and accountability.**
  ***-Most easily identified by a lack of visible or active leadership for fatality prevention*.**

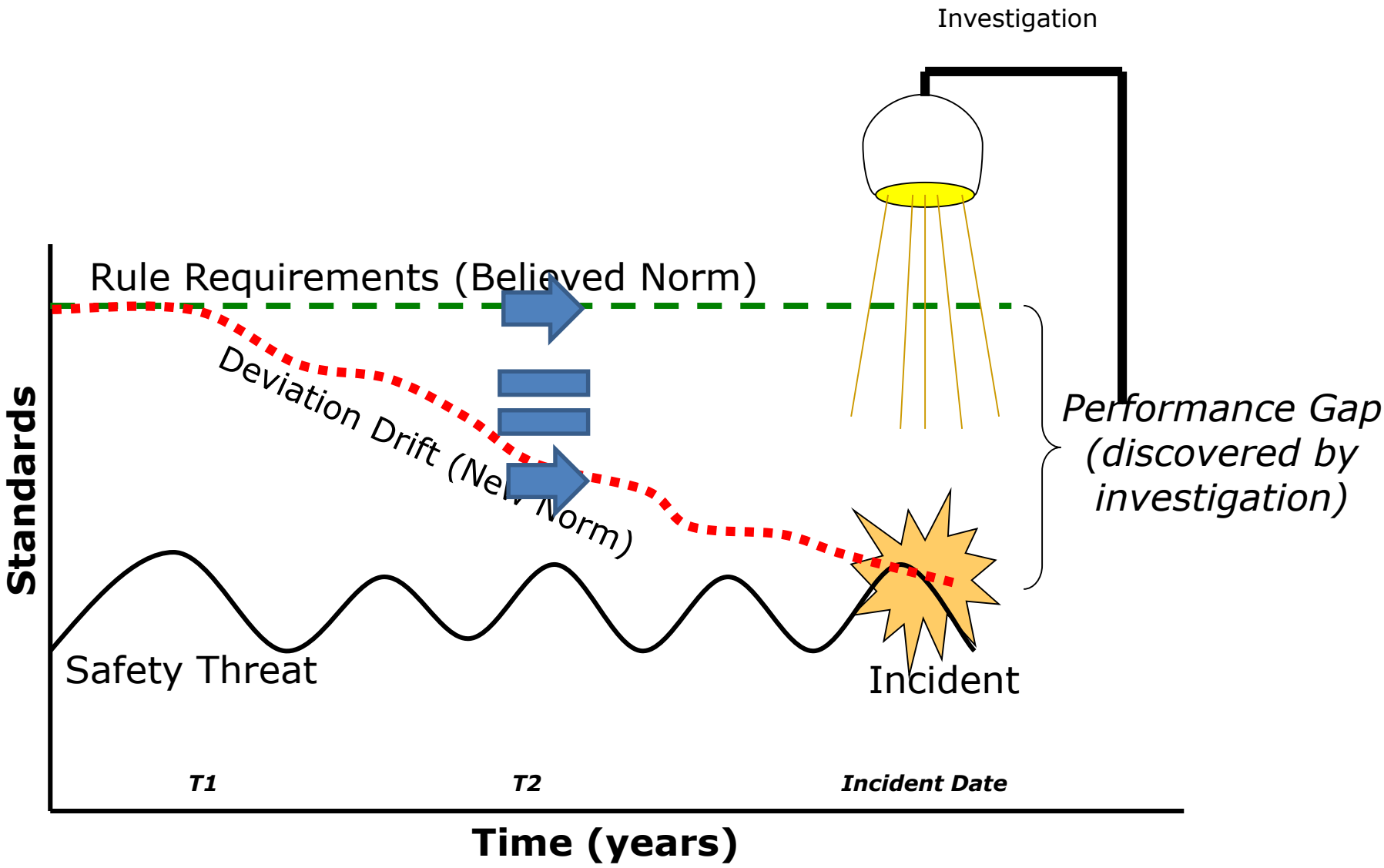
- **Over-confidence is fueled one's by past success.**
  - Often, there is no plan for identifying and managing the "high" risks – daily.
  - Misses the "changes in conditions, boundary issues or non-routine work."

- **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 (e.g. violations of rules or procedures or error).**

- **Available resource capabilities are not consistent with the risk and the magnitude of the challenge.**

Deviation Drift



We have good processes… If we could just get people to follow them we would be fine!

The Problem

- **Fatalities and serious injuries continue to occur because leaders incorrectly apply the hierarchy of control concept to corrective actions, often relying on lower order controls.**
- **During investigations of events, causality may tend to focus on personal safety accountability and decision-making, which results in application of administrative controls (e.g. procedure rewrites, re-training) instead of higher order controls such as elimination, substitution and engineering (re)design.**

Human Nature

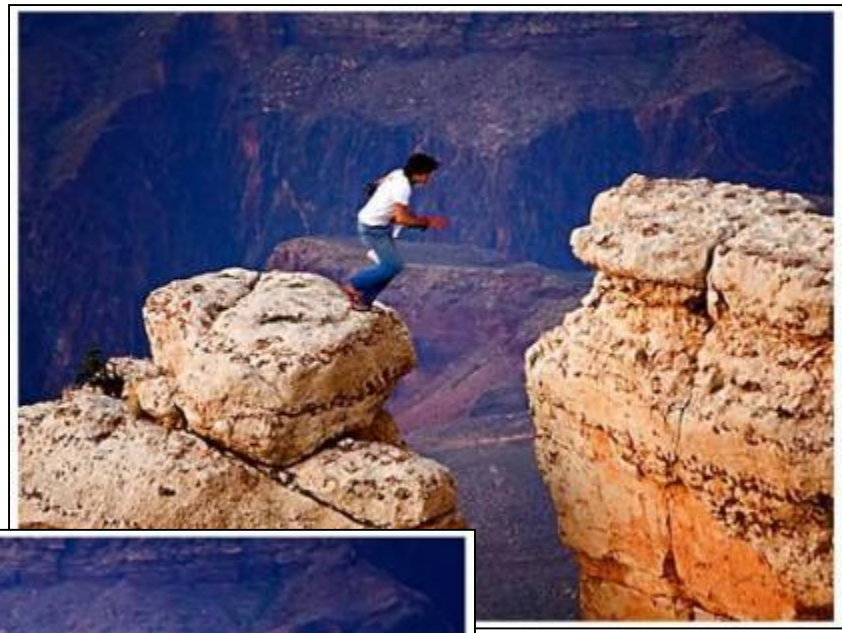
$$\text{Potential to Deviate} = \frac{\text{Difficulty of Task}}{\text{Perceived Risk} + \text{Observation}}$$

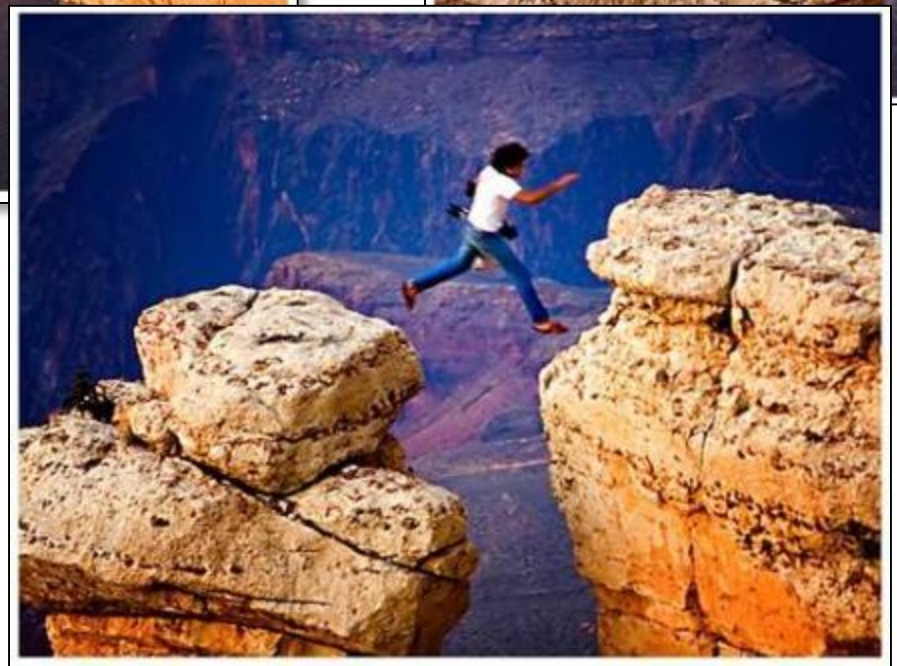

People
Equipment
HUMAN
PERFORMANCE
IS A
SYSTEM!
Programs
Organization
Processes
Work
Environment

Things to Remember

- **90% of Events are Caused by Something Other Than Just the Individual!**
- **95% of People Respond Similarly to the Same Stimuli**
- **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





Things to Remember

- **90% of Events are Caused by Something Other Than Just the Individual!**
- **95% of People Respond Similarly to the Same Stimuli**
- **People Do What They Do, At The Time They Do It For Reasons That Make Sense To Them At The Time!**
- **Human Performance is Not Common Sense!**

Definitions

- **Error:** An action or inaction that ***unintentionally***:
  - Results in an undesirable or unwanted condition OR
  - Leads a task or system outside of limits OR
  - **Deviates** from a set of rules

We MUST learn to separate the ERRORS from the EVENT

- **Event** (or incident): The undesirable result of an error, a set of errors or a set of conditions
- **Deviation:** Not strictly complying with a rule, standard or expectation
- **Violation:** **Intentionally** not complying with a rule, standard or expectation

Errors and violations are different things

Health & Safety System Efforts

Organization Focus

1. **To improve our ability to look for and recognize hazards.**
2. **To provide a means for employees to become involved in the hazard identification process**
   - **Develop “The right set of eyes”**
3. **To be able to understand and evaluate the risk associated with the hazard.**
4. **Empower Everyone in the Organization to Take Action..**

   In the Moment!

System Safety Objective

- *To establish a state such that each person will work under conditions in which hazards are **known** and **controlled** to an **acceptable** level of potential harm (risk)*

What is Risk?

- The expectation of a loss
- It is the combination of …..
  - severity
  - probability

Assessing Risk:

- Is there a hazard?
- If yes ...
  - What is the magnitude of the harm?
  - What is the likelihood that the hazard will cause harm?
  - What controls are in place?

Managing Risk

- A process consisting of evaluation and control of
  - the probability of occurrence and,
  - the severity of the consequences of the hazard
- Determines the extent and nature of controls needed to decrease risk to acceptable levels

Managing Risk vs. Managing Injuries

Injury Management:

- Event occurs
- Existing layers of protection
- Outcome
- Corrective action

Risk Management:

- Identification of hazards
- Existing layers of protection
- Risk (how likely, how bad)
- Layers of protection to be added

You Choose What You Manage!

Hazards and Risks

Types of Risk

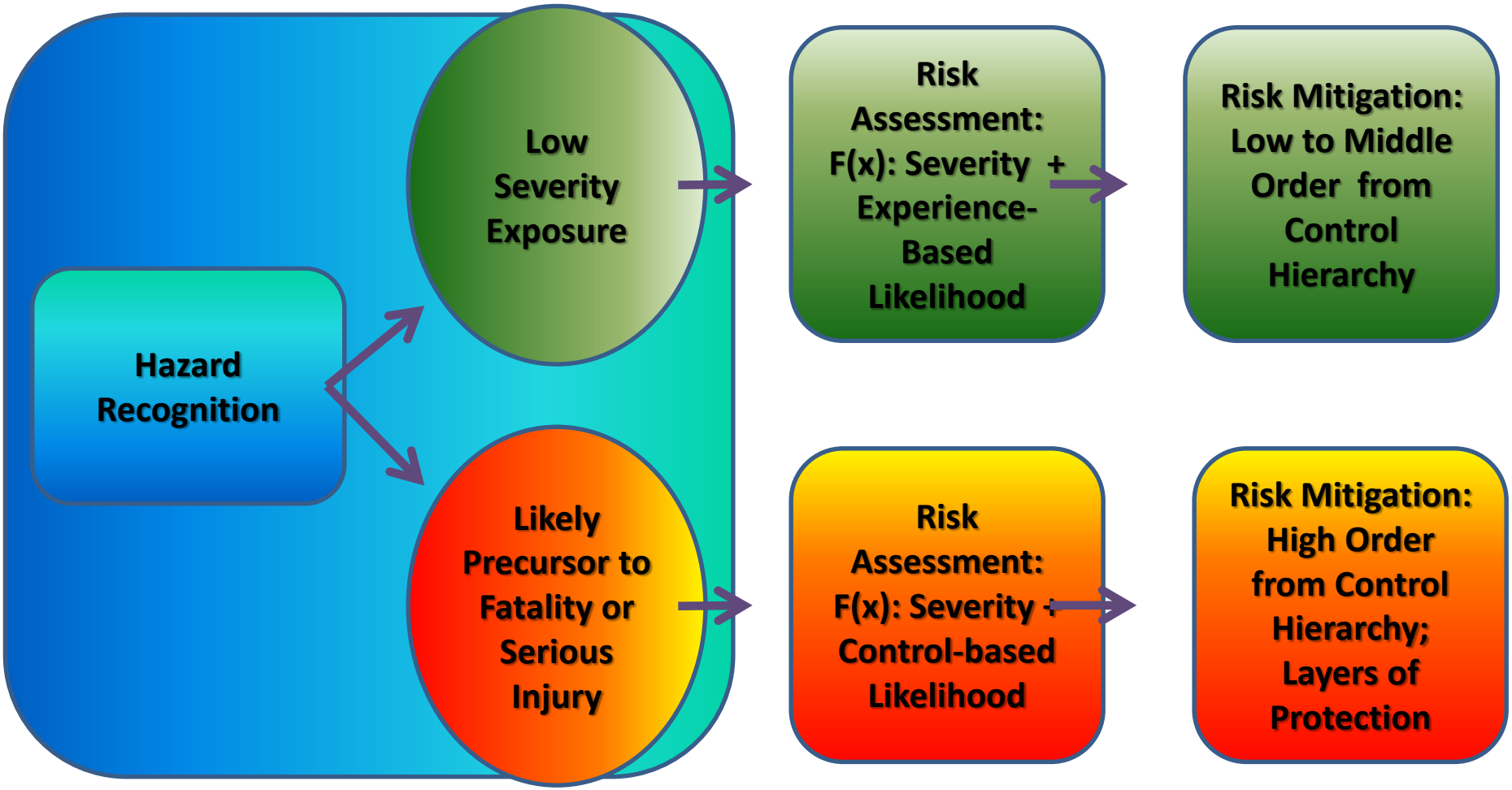
- Unidentified
- Identified

Types of Identified Risk

- Acceptable - Low
- Marginal - Med
- Unacceptable - High

Typical S&H Prevention/Risk Model

Dual Path Strategy for Prevention



“Phase of Operation”

- Installation
- Start-up
- Standard run
- Shutdown
- Troubleshooting
- ***Upset condition***
- Emergency Stop

Be Familiar with the Process to be Assessed:

- Purpose:
  - Understand the process
  - Understand the scope of the Hazard Assessment
  - Review the safety procedures
- Safety orientation:
  - Area
  - Equipment
  - Process
  - Personnel

Become Familiar with the Process:

- **Control stations**
  - **Multiple stations = red flag**
- **Support equipment**
  - **Cranes**
  - **Conveyors**
  - **Fork trucks, etc.**

Become Familiar, How?

- Ask about
  - Upset conditions
  - Methods of communications / verification of crew member location
- Observe and watch

Identifying Hazards:

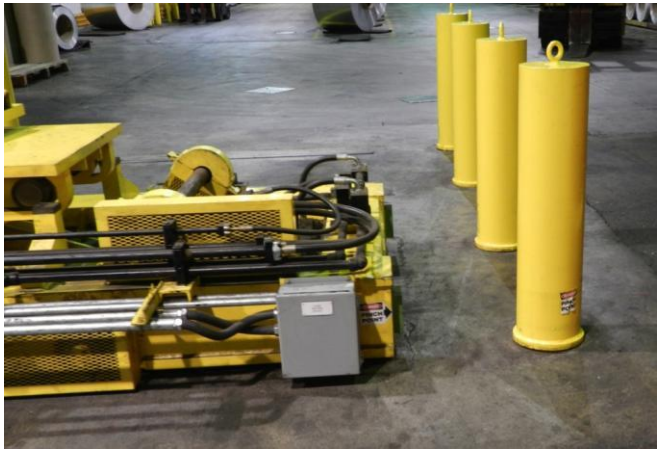
- Use intuitive “safety sense”
- Conduct physical inspections / examinations
- Observe positions and activities of crew
- Talk to crew / operators
- Consider Codes / Regulations / Standards

Identifying Hazards:

- Utilize various hazard identification checklists
- Review prior hazard assessments:
  - Project safety reviews
  - Machine guarding assessment
  - Fall surveys, etc.
- “What-iffing”
- Careful and repeated observation

Equipment-related Hazards:

- Machine guarding
- Fall hazard
- Hot surface contact
- Electrical
- Crush points



People Related Hazards:

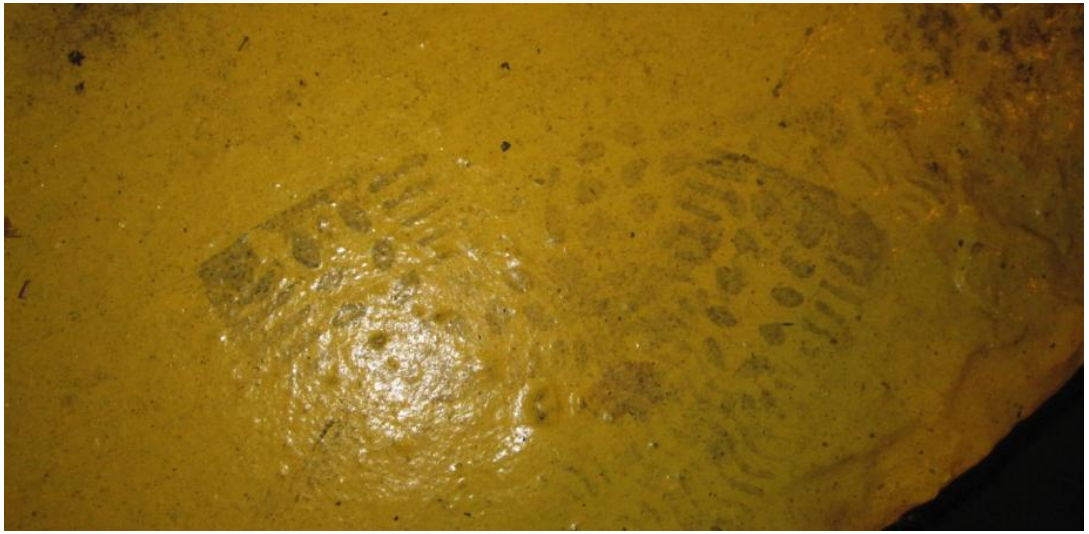
- Position / posture
- Line of fire / barriers
- Hand / finger placement
- Communications

Identifying Hazards:

- **Work area conditions:**
  - **Housekeeping**
  - **Vehicle movement**
  - **Noise levels**
  - **Lighting levels**
  - **Congestion, etc.**

Identifying Hazards

- Visual Clues
  - Damage to equipment/product
  - Molten metal on walls/ceilings
  - Scrapes
  - Footprints



Identifying Hazards:

- **Consider "people position", e.g. are people in safe positions prior to equipment movement?**
- **What methods insure safe positioning of personnel?**

Identifying Hazards:

- Warnings?
  - Line of sight?
  - Automatic movement?
  - How fast or slow is movement?
- Escape routes

Identifying Hazards:

- **Who else enters area?**
  - **Contractors**
  - **Metallurgical**
  - **Vibration analysts**
  - **Quality samples**

Identifying Hazards:

- **Review historical evidence:**
  - **Injury free events**
  - **Safety-Alerts**
  - **Injury / Illness data**
  - **Ask about incidents that have occurred**

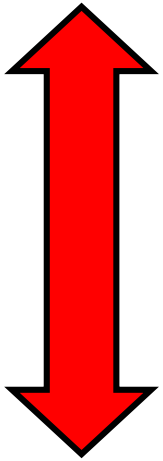
Remember…

You will never find
"ALL"
of the hazards!

Your Job is to Teach People How to Fish!
Recruiting an entire organization of Safety Managers!

Layers of Protection

Most Effective



Least Effective

1. Design change
2. Engineered safety features
3. Safety devices
4. Warning devices
5. Procedures/Training/PPE

Integrity of Layers of Protection

- **Inspected?**
- **Audited?**
- **Maintained?**

Is it a "Real" Layer of Protection?

  - **Mean Time to Detection**

Layers of Protection

What Layer of Protection is This?

Most Effective

1. Design change
2. Engineered safety features
3. Safety devices
4. Warning devices
5. Procedures/Training/PPE

Least Effective

Layers of Protection

What Layer of Protection is This?

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Layers of Protection

What Layer of Protection is This?

Most Effective

1. Design change
2. Engineered safety features
3. Safety devices
4. Warning devices
5. Procedures/Training/ PPE

Least Effective

When Do We Accept Risk:

- When we don’t know it’s there
- When it’s significantly low
- When we’re sure “it’s worth it”

What we know…

People, their perception of risk, subsequent choices, and actions are the biggest variables in the "safety equation".

Here are a few of the examples from some fatalities:

- **Chasing a moving bus**
- **Assigning a new employee to a task without the required mentor.**
- **Transporting and unsecured load**
- **Descending stairs carrying an object - potentially not using the handrail.**
- **Deviating from energy isolation procedures**
- **Deviating from a defined pedestrian walkway**
- **Exercising a "rolling – stop"**
- **Not attaching the lanyard to the lifeline provided.**
- **Commencing with a task under a "stop work" directive.**
- **Permitting two employees with less than 6 months collective experience unsupervised on a roof.**

What we need to do…

Continue to broaden the scope of our hazard identification efforts.

Looking for exposures…

At remote locations, boundary & support services.

Transportation & Delivery

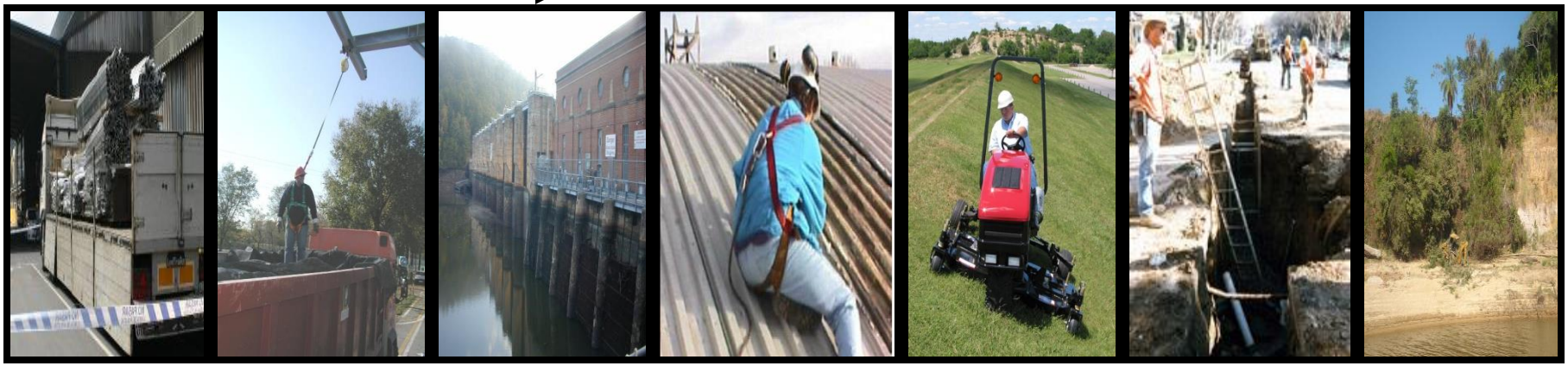
Power & Dams

Roof Work

Buildings &Grounds

Excavation /C. Spaces

Remote Situations



What we need to do…

Continue to address the risks we know about in a timely manner.

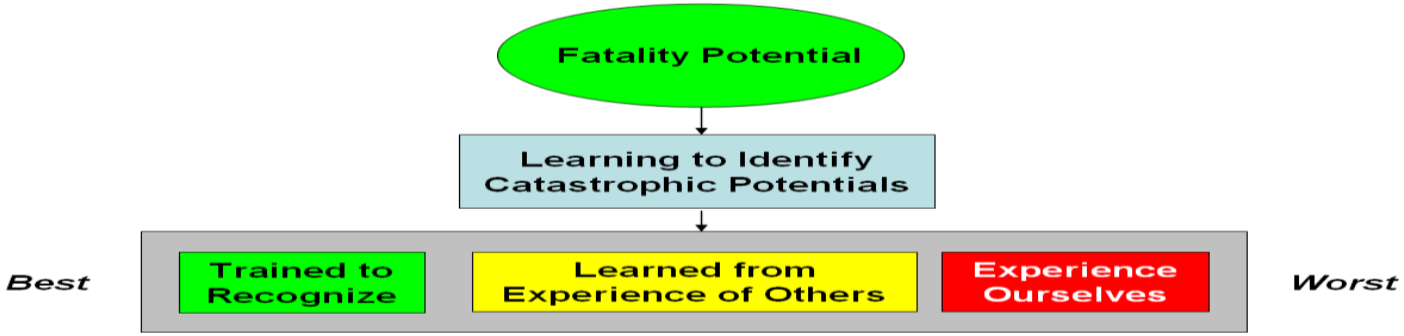
- **Interim controls**
  - **Required when a more permanent layer of protection is not readily available**
  - **Must provide at least a "marginal" level of safety**

- **Empower employees to STOP THE JOB**
  - **If the equipment or the task represents an imminent risk (e.g. catastrophic potential with likelihood of occurrence) and the risk can't be reduced or controlled, the job or task needs to stopped.**

- **Select and Implement layers of protection**
  - **Effectively eliminate or minimize the risk**
  - **Consistent with hierarchy of control**

What we need to do…

Apply the Lessons Learned more aggressively and consistently.



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,
- AND, 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!**

What we need to do…

Move faster/deeper into the organization to influence individual perceptions of risk and deviation potential.

When to we accept risk?

When we don't know it's there.
When it's significantly low.
When we're sure "it's worth it".

Tools in our Toolbox

- Hazard Awareness Training
- Recognition of Error Trap & Triggers
- Tools - STAR & Safe-Start
- Peer-check
- NTJ Mentoring
- Working-alone risk
- Permits for high risk tasks
- SWI for non-routine work and trouble-shooting
- Planned Pre-job Briefings
- Planned Field Observations
  - -High risk tasks
  - -Remote work
  - -New/transferred employees

What we need to do…

Ensure the fundamentals are in place.

Move faster to close any remaining gaps in contractor safety process…

- **Responsible Person who is actively engaged** in the daily management of the contractors on site.
  - *- Hands-on the pre-qualifications, hazard assessments, pre-job planning, and field audits/observations.*
- **Safety Hazard Assessments and Job Specific Safety Plans**

- **Screen for and manage "High" risk contractors closely.**
  - **-** *Requires written approval by the plant manager or BU EHS.*
  - *-Evaluate how many high risk contactors are on site at once.*
  - *-Ensure sufficient resources in place to manage/monitor high risk.* contractors.
- **Robust and frequent audits/field observations** to ensure that deviations are identified, corrected and communicated.

What we need to do…

Avoid focusing <u>exclusively</u> on the "catastrophic equipment failure or the complex process risks" by getting in the field…

Field Observations:

- **Maintain a visible floor presence.**
- **Set and calibrate expectations.**
- **Get the "big picture"- foresee where you are likely to be vulnerable.**
- **Look for the "triggers" that signal the presence of an error trap…**
  - **-observable actions or reactions,**
  - **-a recognized thought or individual perceptions**
  - **-or a "gut-feeling" that something isn't right**
- **Gives you the opportunity to provides guidance at the critical decision points.**
- **Gives you the opportunity to address deviation potential in the moment.**
  - **- Remember fix the sources of error-not the blame.**
- ***Sometimes it's not the complex sequence of events, but the most simple straight forward deviation from "fundamentals" that becomes the fatality.***

“A person should not pay for a mistake with their life or limb ”

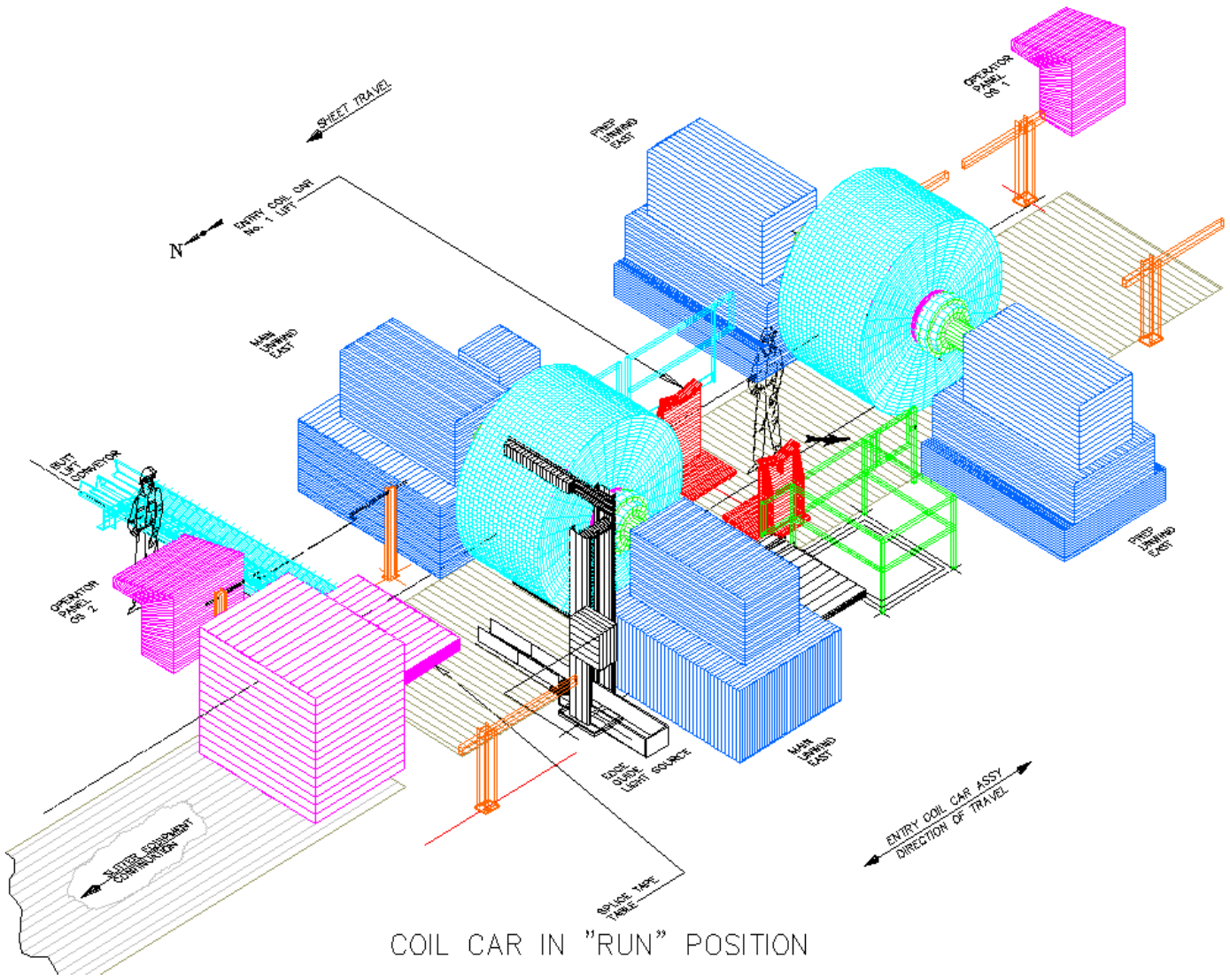
Why?

Dawn Ewing

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

Summary:

- Apparently attempting to move scrap
- Between two unwind stations
- Pinned between a coil car lift arm and...
- Stationary coil



COIL CAR IN "RUN" POSITION

Engage Senior Leadership

Have A Proactive Discussion About…

- **Existing levels of risk**
  - Organization's S&H values/risk tolerance
  - Existing exposures that could result in unacceptable outcomes
- **Limitations of current approaches for preventing fatalities and serious injuries**
  - Using OSHA data to identify problems and target prevention efforts
  - Hazard recognition and risk assessment
  - Mitigation and control
- **Availability of new tools and approaches for serious injury prevention**

➢ **Get empowered – make the value proposition for revitalizing the company's approach to serious injury prevention**

- Moral
- Financial
- Customer
- Worker satisfaction
- Compliance

Questions?

Preventing Fatalities and Serious Injuries

Strategies and Lessons Learned