Agenda

- Research & Definitions
- Key Conclusions
- What to do about it
- Q/A
Incident Rate Trends: Non-Fatal vs. Fatal

Source: US BLS
SIF Defined...

- **Life-Threatening:**
  - Work-related injury or illness that required immediate life-preserving rescue action, and if not applied immediately would likely have resulted in the death of that person.

- **Life-Altering:**
  - Work-related injury or illness that resulted in a permanent and significant loss of a major body part or organ function that permanently changes or disables that person’s normal life activity.

- **Fatal:**
  - Work-related fatal injury or illness.
Traditional Safety Triangle *is* Descriptive

- 1028 Total Cases Studied
- 7 Global Clients

Data from 2008-2009

<table>
<thead>
<tr>
<th><em>Average Rate</em></th>
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</thead>
<tbody>
<tr>
<td>Serious Injuries and Fatalities</td>
</tr>
<tr>
<td>Restricted and Lost Workday Cases</td>
</tr>
<tr>
<td>Medical Treatment</td>
</tr>
</tbody>
</table>
Traditional Safety Triangle \textit{is not} Predictive

A subset of reported cases will have SIF Exposure.

A reduction of injuries across the base of the triangle or working outside the SIF triangle will not correspond to a proportionate reduction of SIFs.
SIF Exposure

SIF Actual
- Life-Threatening Injury or Illness
- Life-Altering Injury or Illness
- Fatality

SIF Potential
- Realistic possibility
- Repeat exposure 100X
- One or two things change
- If not for luck...
- Worker perspective

SIF Exposure
- SIF Precursor
- Discovery

Very few “Actuals” + many “Potentials” = SIF Exposure
The Current Paradigm – Are We Stuck On This?

- SIFs and Non-SIFs have the same causes and correlates.

- You can impact the top of the triangle by working on the bottom of the triangle (the triangle is predictive).

- TRIR and audit information are reliable indicators of SIF Exposure Potential.

- When SIFs occur, they are one-offs.

- Accident investigations (are transactional) and good enough.
A New Paradigm

A new way of thinking about the Safety Pyramid:
Focus on prevention of SIFs.

Precursors
High-risk situations in which management controls are either absent, ineffective, or not complied with, and which will result in a serious or fatal injury if allowed to continue.

- Fatal and Serious
- LT/RD Injuries
- Recordable, Medical and FA Injuries
- Near-Misses, Property Damage, Spills and Releases, Fires, Reliability Incidents, etc.
- 21% SIF Exposures
SIF Precursor = a high-risk situation in which management controls are either absent, ineffective, or not complied with and which will result in a serious or fatal injury if allowed to continue.
Don’t Expect SIF Prevention by Working Outside of the SIF Triangle
Recordable Injuries Log is Misleading When it Comes to SIF Exposure
Recordable Injury Log is Misleading

Fractured Foot

Case A (SIF Exposure = No) – Employee suffered a fractured foot when they climbed out of a truck cab, missed the bottom rung of the ladder, and fell 30 inches to the ground. Their foot rolled off a small rock, resulting in a fracture.

Case B (SIF Exposure = Yes) – Employee suffered a fractured foot when backed over by a forklift truck (PIT). The PIT operator backed up without looking, and the backup alarm was not functioning. This easily could have been a serious (life-threatening or life-altering) injury, or fatality if the employee’s full body had been struck and run over.
The SIF Blind Spot is Significant
Accident Reporting & Investigations Are Not As Good As You Think They Are

Longitudinal analysis will prove it, and will point out leadership and culture implications.
Accident Investigation Processes Must Become Transformational

- Longitudinal analysis
- Multiple contributing factors, root causes, and SIF Precursors
- Effectiveness of corrective and preventive actions
- Tracking of recommendations and verification of problem-solved
- Effective communication and implementation of lessons learned
- The perspective of the affected workers
- Proportionate response
- Case narrative descriptions must help us understand what really happened and the context surrounding the exposure.

Encourages and supports reporting!
Proportionate Response

**SIF Exposure**
- Report – High Level / Across Organization
- Deeper Investigation
- Share Action Plan – High Level / Across Organization

**Non-SIF Exposure**
- Report – Locally
- Short Form – Investigation

**Patterns**
- Report – Affected Groups
- Root Cause Investigation
- Develop Action Plan to Address – Trend
- Share Action Plan – Those That Need to Know

**Share Action Plan**
- High Level / Across Organization
- Those That Need to Know
Solutions Are Typically Centered in the Lower Rungs of the Hierarchy of Controls
<table>
<thead>
<tr>
<th><strong>The Hierarchy of Controls</strong></th>
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<tbody>
<tr>
<td><strong>Elimination</strong></td>
</tr>
<tr>
<td>Complete redesign of the system to remove the exposure</td>
</tr>
<tr>
<td><strong>Substitution</strong></td>
</tr>
<tr>
<td>Switch out a process step with a less hazardous step; Use low voltage system versus high voltage; replace a toxic material with a non-toxic material</td>
</tr>
<tr>
<td><strong>Engineering Controls/Isolation</strong></td>
</tr>
<tr>
<td>Isolate hazard; install guards and/or interlocks; build barriers; use light curtain; develop new tool</td>
</tr>
<tr>
<td><strong>Administrative Controls</strong></td>
</tr>
<tr>
<td>Post signs and warning; Write procedures and rules; Train employees</td>
</tr>
<tr>
<td><strong>Personal Protective Equipment</strong></td>
</tr>
<tr>
<td>Provide protective equipment for Employee (e.g., hard hats, respirators)</td>
</tr>
<tr>
<td><strong>Gimmicks; incentives; hollow threats</strong></td>
</tr>
<tr>
<td>Employee seen as the cause of exposure and requiring motivation, no change in exposure.</td>
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</tbody>
</table>
SIF Events Are Not One-Offs. The Precursors Have Been There All Along.

Our vocabulary and reaction to SIF must change.
WHERE DO YOU START?

Educate senior leaders on SIF exposure.

Provide visibility to SIF exposure.

Identify SIF precursors.
Three Things You Must First Do

1. Educate Senior Leaders on SIF:
   - They need to understand this problem before they can act on it.
   - The solutions to the SIF problem require their regular attention.
   - Enlist their sponsorship.

2. Provide Visibility to SIF Exposure:
   - Define “SIF”: Life-Threatening vs. Life-Altering.
   - Calculate SIF Exposure Rate: SIF Recordable and SIF Total.
Three Things You Must First Do (continued)

3. Know Your SIF Precursors:
   • Three places where they hide:
     • High Risk/High Exposure Tasks (81% Routine)
     • Management Systems Missing, Deficient, or Not Complied With
     • Allowed to Continue
<table>
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<th>Nine Interventions That Really Matter</th>
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<tr>
<td><strong>Life Saving Safety Rules</strong></td>
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<tr>
<td><strong>Normalization of Deviation Controls</strong></td>
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<tr>
<td>Management Field Verifications</td>
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<tr>
<td><strong>Pre-Task Risk Assessments</strong></td>
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<tr>
<td><strong>Pause Work &amp; Near Miss Reporting</strong></td>
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<tr>
<td><strong>Incident Handling Systems</strong></td>
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<td><strong>Incident Data and Analytics</strong></td>
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<tr>
<td><strong>Contractors Selection Oversight Retention</strong></td>
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<tr>
<td><strong>Over Road MV</strong></td>
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<tr>
<td><strong>Understanding &amp; Influencing Human Behavior</strong></td>
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Client A – Total SIF Incident Rate Is Declining

Total SIF Incidents
(Injury/Illness, Vehicle, Property Damage, Near-Miss)
Control Chart

![Line chart showing the decline in total SIF incidents per 100 employees from January 2013 to November 2014. The average line is shown in orange, and the rate line in dark blue. The rate line shows a steady decrease over time, indicating an improvement in safety performance.]
OSHA & DART Rates over Time

SIF Strategy Begins May 2012

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Final Thoughts

As senior executives and safety professionals we can’t “not know” about our SIF potential.

SIF exposure recognition and mitigation is a core operational responsibility.

The closer you get to an SIF exposure, the more likely you are to take action on it.
Thank You

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Normalization of Deviation – how it starts

- No knowledge of procedure/field improvisation
- Following procedure is optional/workarounds
- Inconsistent application and interpretation
- Ease of granting variances
- Ineffective exception management

But wait... there’s hope!!!
Work on the right problem

INSTEAD OF . . .

Human performance
Human error
Mistake elimination

WORK ON . . .

Focus on safety critical tasks
Mitigating severe consequences of human error
Performance reliability