7 INSIGHTS INTO SAFETY LEADERSHIP

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CHAPTER 2

SAFETY LEADERSHIP STARTS WITH ATTENTION TO SERIOUS INJURIES AND FATALITIES

About ten years ago, Krause received a call from the corporate safety director of a global organization he had been consulting with on safety leadership. The director said they had observed a disturbing pattern in their data: Recordable injuries were declining steadily over the previous five year period, but serious and fatal injuries were level during the same time period.

Senior corporate leadership had seen this information and was very concerned about it. They had discussed it for months, and the organization as a whole was perplexed. They had assumed, as most organizations have, that as their smaller injuries declined, their larger ones would as well.

They asked Krause to develop a new paradigm for the prevention of serious injuries and fatalities and bring it to a meeting of their top hundred leaders globally and present it. He took on the challenge, and over the next several months we looked at data across organizations, across industries, and across North America. We found that a similar pattern existed consistently in all areas. And the analysis changed our thinking about how we approach serious injuries and fatalities.

Put bluntly: The traditional view that preventing smaller injuries will lead to preventing larger ones has been shown to be false. The second insight into safety excellence is that *safety leadership should begin with attention to serious injuries and fatalities (SIFs)*. We'll show why in this chapter, and the reasons are strategic, compassionate, and research-based.

THE TRADITIONAL SAFETY TRIANGLE AND THE NEW DATA

The concept of the Safety Triangle (Figure 1) was first presented by Herbert William Heinrich in 1931. It has been widely accepted by the safety community worldwide. It has two premises:

- Frequency and severity are inversely correlated. Any distribution of injuries will have a larger number of small injuries (represented at the bottom of the triangle), and a smaller number of more serious injuries (represented at the top of the triangle).

- Reducing injuries at the bottom of the triangle will also reduce injuries at the top of the triangle.

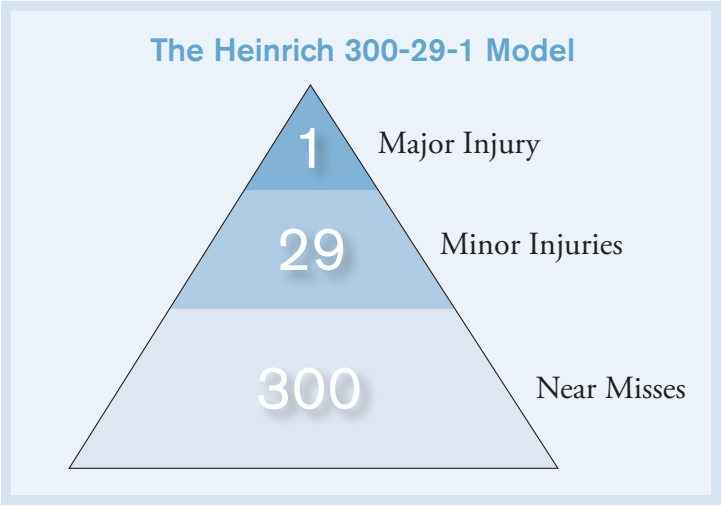

Figure 1

Yet, as we looked at that data from organizations and industries across North America, we saw a trend of non-fatal injuries steadily dropping while fatalities decreased slowly or not at all.

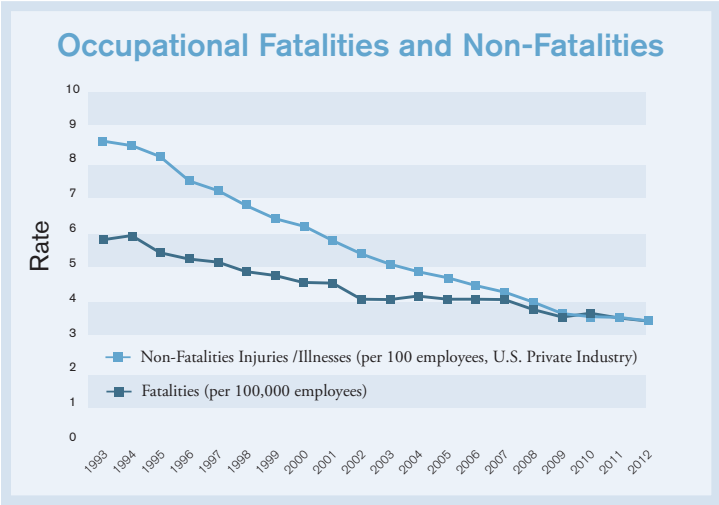

Figure 2

This pattern implicates the design and implementation of existing safety systems as inadequately addressing SIFs. It calls into question why safety systems, in general, are working to reduce smaller injuries without working specifically to address more acute events on their own terms. In short, this pattern is a very big deal, and it demands the attention of safety leaders across the organization.

Some of the safety community look at this pattern and shrug their shoulders, because it doesn't fit with a principle they've held for a long time. But unless we are willing to challenge our assumptions and understand the specific reasons for this pattern, we will not be in a position to understand what changes need to be made in order to address it. In the workplace, what this looks like at the day-to-day level is a pattern where the recordable injury frequencies of a given organization are low and either level or getting lower—and suddenly, seemingly out of the blue, a serious or fatal injury, or even a series of SIFs occur. This is a surprise to operations people, and it leaves them disappointed and perplexed.

THE STUDY

As a result of this initial data analysis, a group of global organizations came together to pool their data and study the problem. BST and ORCHSE co-sponsored the research group, which agreed with the participant organizations that the findings of the study would be held in the public domain and made available as widely as possible. The participating organizations were ExxonMobil Corporation, Archer Daniels Midland Company, BHP Billiton, PotashCorp, A.P. Moeller – Maersk Group, Cargill Inc., and Shell.

The study asked two broad questions addressing the two premises of the Safety Triangle:

1. Is the widely accepted description of the incident distribution found in the Safety Triangle accurate?

2. Are SIFs similar in nature and cause to smaller injuries?

We'll explore the findings below.

IS THE DISTRIBUTION BEHIND THE SAFETY TRIANGLE ACCURATE?

The study confirmed Heinrich's first premise; more people suffered minor injuries than major injuries, and more major injuries than serious injuries or fatalities. Figure 3 shows the combined data from all six organizations and it is clear that the distribution aspect of Heinrich's idea is correct: The inverse correlation between number of incidents and severity of incidents is an accurate and useful concept, and there was no evidence that it should be discarded.

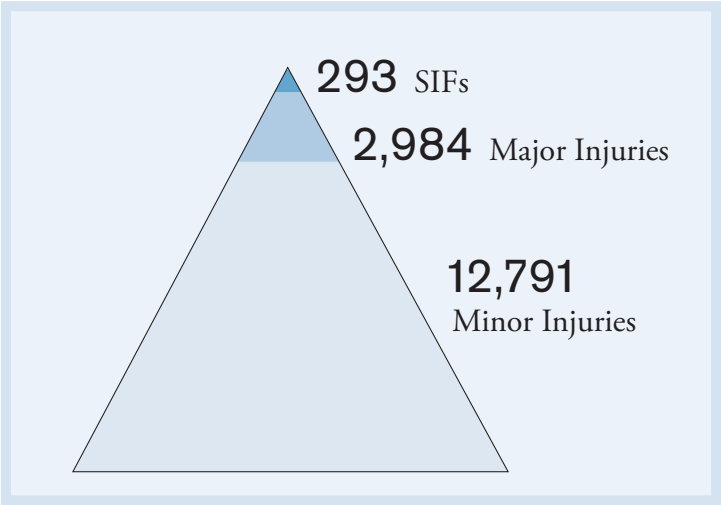

Figure 3

This finding has further implications. It also means that a single serious event is necessarily a reflection of many other events that *could have been* serious. One incident occurs every x times when the potential for an incident exists. Drunk drivers don't have accidents each time they drive. Yet, single incidents tell us about the whole system. It takes a set of variables happening at the same time to produce an incident. For instance, the driver is drunk, the car brakes are faulty, the child runs into the street when visibility is low, etc. So when an accident or incident happens, we are wrong-headed to think it is a one-time single event. The set of variables that led up to the event have happened many times previously with no incident. We know this from the Safety Triangle.

When this is not understood, misattribution manifests in reactions like the ones below:

> "This was a one-off event"
>
> "This catastrophic event was not related to systematic factors in the industry"

"Sometimes you step off the curb and get hit by a bus"

"We don't see a pattern in the data"

But in fact there *is* a pattern. And it points us towards a better approach to reducing SIF events.

ARE SIFS SIMILAR TO SMALLER INJURIES?

To examine whether SIFs are similar in nature and in cause to other injuries, we broke the question into two more parts:

- Do some circumstances have greater potential to lead to a serious injury or fatality than others?
- Do SIFs have different kinds of characteristics and causes than less serious injuries?

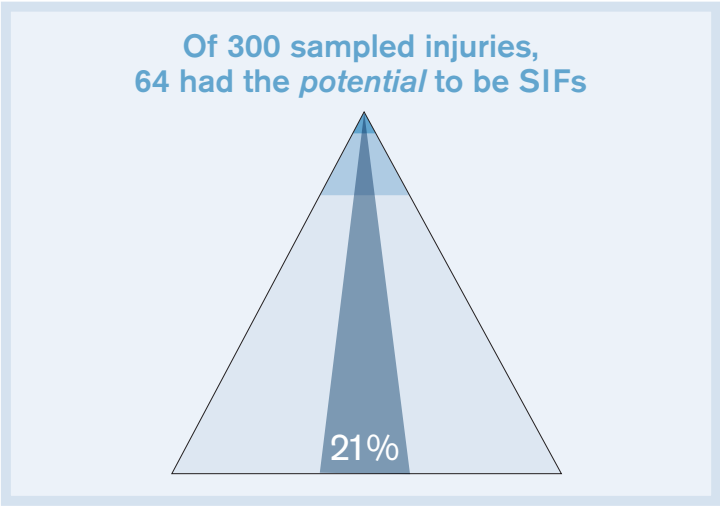

Figure 4

Figure 4 does indeed show that only a subset of smaller injuries

have the potential to be serious or fatal injuries. In this sample of 300 injuries across six organizations, just 21% of smaller injuries had the potential to have been SIFs. This finding explains at least in part why some organizations see reductions of recordable injuries but not of SIFs.

This finding is a direct contradiction of the second premise of the Safety Triangle concept: *Reducing injuries at the bottom of the triangle will not necessarily reduce injuries at the top of the triangle.* This means that leaders must focus attention where it counts. Leaving it to chance and assuming that safety efforts will reach up to SIFs because they are reducing smaller injuries is a flawed strategy. *We have to start with SIFs directly.*

If leaders do not have this crucial insight they will make decisions incorrectly. For any kind of safety effort that seeks to identify hazards as a mechanism for creating a safe workplace, a leader should ask, "How do you focus attention on SIF prevention?"

SIFS HAVE DIFFERENT CHARACTERISTICS AND CAUSES

The study also found evidence that SIFs differ from minor incidents in both their characteristics and causes. For instance, it showed that Safety Absolutes (things like lock out tag out, confined space entry, fall protection) played a part in 71% of SIFs, but only 17% of less serious injuries (see Table 1 below). That's a big difference. A leader who understands this finding will target SIF prevention and ask questions like, "How do you assure that employees are able to adhere to the Safety Absolutes and do so reliably?

Table 1

	SIFs	Non-SIFs
Safety Absolutes	39 / 55 (71%)	5 / 35 (17%)

What's more, *not all injuries have SIF potential*. SIFs are disproportionately related to certain types of activities. Knowing that, identifying SIF precursors will help inform intervention strategies.

A precursor is an unmitigated high-risk situation that will result in a serious or fatal injury if allowed to continue. Here are three examples drawn from actual SIFs:

- Front-end loader operators must reposition their equipment in areas with other people working nearby. Their ability to see their paths of travel are limited by the terrain and their practice of storing extraneous material on top of the rear portion of the cabs.

- Workers repeatedly expose themselves to carbon monoxide, even after complaining of 'bad air.' They do not test the air before entering high-risk areas and they do not carry respirators.

- Pipeline inspections using poorly calibrated equipment produce erroneous measurements of metal loss due to corrosion. One pipeline that is used by three different companies is inspected and reported to be well within operating limits, when in actuality it is on the brink of failure in many places.

The leader who targets SIF prevention is concerned with the precursors of SIF events. Addressing precursors is a system-wide view that prioritizes reductions in the most severe events.

A NEW PARADIGM FOR SERIOUS INJURIES AND FATALITIES

Over the years, we have heard many variations of the following story: "I came to work the other day and found a pack of guys

in ties with clipboards walking around the parking lot taking notes. It was pathetic. Do they really think they are doing something for safety? I could have shown them things in the plant that they should have been looking at."

We need a new paradigm to understand and guide prevention efforts for SIFs. The old paradigm has a valid generalization of the way incidents vary by frequency and severity, but it is misleading with respect to understanding and preventing SIFs. The old paradigm incorrectly assumed:

- All injuries of low severity have the same potential for serious injury.
- Injuries of differing severity have the same underlying causes.
- One injury reduction strategy will reach all kinds of injuries equally.

These inaccuracies of the old paradigm have been detrimental. They have resulted in elevation of trivial issues, creative classification of injuries, loss of credibility with labor organizations, cynicism among workers, and ineffective fatality prevention.

It has also been damaging to the credibility of leaders who espouse it. Think of Deepwater Horizon, where a few days before the catastrophic explosion that led to the sinking of the oil rig, 11 fatalities, and the largest oil spill in the history of the petroleum industry—the location was given a prize for excellence in safety performance.

This pattern is seen repeatedly in the analysis of SIF events. What effect does it have on the culture of the organization when leaders talk enthusiastically about the success of safety efforts, while sitting on a potential fatal event waiting to happen? Front-

line employees and supervisors know of these vulnerabilities. So what they hear from leaders saying otherwise is at the very least ignorant and at worst downright hypocritical.

We can do better. What we need is a new paradigm that accounts for four key findings from the research:

- Injuries of differing severity have differing underlying causes.
- All minor injuries are not the same: A sub-set of low severity injuries are associated with precursors to serious injuries and fatalities.
- Reducing serious injuries requires a different strategy than reducing minor injuries.
- The strategy for reducing serious injuries should use precursor event data drawn from all available sources of data: accidents, injuries, near misses, and exposures.

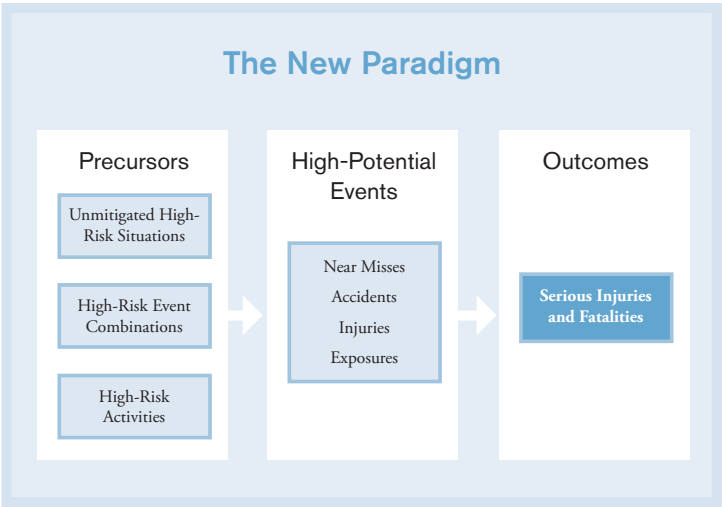

Figure 5

So keep the Safety Triangle if you want to talk about the ratios of SIFs to minor incidents; but if you want to do something to reduce SIF events, we suggest thinking in terms of the paradigm shown in Figure 5.

Focus on the potential for serious injury. Identify precursors. Precursors lead to high potential events including near misses, and high potential events lead to SIFs. The effects of the new paradigm are:

- More focused effort on the prevention of serious injuries.
- Stronger safety culture.
- More engagement of labor organizations in safety.
- Lower rates of serious injuries.

If a facility has vulnerabilities for SIFs and is not paying attention to those precursors in a systematic way, focusing on small injuries is counter-productive. It allows SIF rates to stagnate and employees to get hurt. It leaves the most senior leaders flummoxed when a serious injury occurs seemingly out of the blue—while the worker who sees the vulnerabilities day in and day out counts the event as inevitable.

Senior leaders at every level are motivated to reduce SIFs. They are frustrated by the fact that they spend time and resources on safety and still have them. That time and money is better spent—and safety professionals have better access to the tools they need to get things done—when they address SIF reduction.

Examples of Situations that May Have High Proportions of Precursor Events

Mobile equipment operation

Confined space entry

Jobs that require lock-out tag-out

Lifting operations

Working at height

Caustic liquid handling

Manual handling

Process instability

Significant process upsets

Unexpected maintenance

Unexpected changes

High energy potential jobs

Emergency shutdown procedures