



White Paper

From Close Calls to Critical Insight: Rethinking Near Miss Reporting

Executive Summary

Near miss reporting is one of the most powerful, yet misunderstood, tools available to organizational leaders and safety professionals. When properly implemented, near miss programs provide organizations with necessary early warning signals, allowing proactive intervention before injuries, fatalities, or catastrophic failures occur. However, empirical and anecdotal evidence indicate that near miss data is widely underreported, misapplied, misinterpreted or, even worse, weaponized against the workforce.

This white paper examines near miss management holistically: from its intellectual origins in the 1930s and codification through International Organization for Standardization 45001 in the 2010s to the practical challenge of turning weak signals into meaningful exposure reduction. Drawing on peer-reviewed research, case studies, international standards and DEKRA experience in serious injury and fatality prevention, this paper identifies common misuses and misunderstandings and offers a practical framework for reform.

Key findings include:

- *The gap between near miss management in theory versus practical execution is wide.*
- *Near misses are often undermined by punitive organizational cultures, driving reporting underground and leading to a false sense of safety.*
- *Heinrich's ratio, while historically influential, is frequently misapplied as a predictive formula rather than a descriptive model.*
- *Organizations that effectively leverage accurate near miss data demonstrate measurable reductions in Serious Injuries & Fatalities (SIF).*

In essence, near misses are free lessons. The organizations that benefit from them are not the ones that collect the most reports; they are the ones that recognize meaningful signals, understand SIF potential and act before exposure becomes harm.

Foundations

Definitions

Before understanding how near misses are misused, it is important to understand what near misses are and how definitional ambiguity is one of the primary barriers to effective reporting.

Definitional ambiguity (see Table 1) creates two issues: (1) it makes cross-organizational benchmarking nearly impossible, and (2) it limits the ability to conduct research on near miss data across studies to find new approaches to this valuable source of data.

Table 1 – Ambiguous definitions for near miss

Authority/Standard	Definition
ISO 45001	Occurrence arising from work that could have resulted in injury or ill health
OSHA	No formal regulatory definition; sector/division guidance varies
UK HSE	Events not causing harm but having the potential to cause injury or ill health
National Safety Council	Unplanned event that doesn't result in injury or death, but could have
Center for Chemical Process Safety	An incident where no loss occurred but had the potential to do so, including all demand events on protection layers
ANSI Z10	Unplanned event that did not result in injury, illness or damage – but had the potential to do so
Joint Commission	Event or situation that could have resulted in harm, error or adverse outcome

In addition to definitional ambiguity, many organizations do not even use the term near miss but use one or more of these other common descriptors, creating additional misalignment and inconsistency:

- *Good catches*
- *Close calls*
- *Near hits*
- *Near accidents*
- *Precursor events*
- *No-harm incidents*

Descriptors and definitions that are used interchangeably across regulatory agencies, standards bodies and organizations create challenges in capturing consistent data, resulting in ineffective trend analysis and the potential for undermining the entire program.

What DEKRA Has Learned

Near miss value depends on clarity. When employees, supervisors and investigators apply different definitions, organizations lose the ability to see exposure patterns, prioritize SIF potential and learn across sites. A shared definition is not administrative cleanup; it is the foundation for meaningful event learning.

History

The modern safety field owes much to early work that connected minor incidents, near misses and severe outcomes. Heinrich's model helped organizations recognize that serious events are rarely isolated surprises. However, the lasting problem is not the idea that weak signals matter. It is the way the triangle is often applied.

Heinrich's Triangle

In 1931, Herbert Heinrich analyzed industrial incident reports and proposed the now-famous 1:29:300 ratio: for every major injury, there were 29 minor injuries and 300 near misses. The model was influential because it suggested that severe incidents could be preceded by a much larger number of lower-consequence events.

Over time, many organizations began treating the triangle as a predictive formula rather than a conceptual model. This is the core misunderstanding. Heinrich's ratio was not a universal law, and later research has challenged the idea that reducing low-severity incidents will automatically reduce fatalities or SIF events. Minor incidents and serious events may share common system causes, but they do not always follow the same causal pathway.

DEKRA's own SIF prevention work reinforces this distinction. The relationship between frequency and severity may be triangular in shape, but the ratio is not constant. More importantly, organizations can have very low recordable rates while still carrying significant SIF exposure. The practical takeaway is clear: near misses should not be used to predict a fatality by count. They should be used to identify exposure, understand control effectiveness and detect system weakness before harm occurs.

What DEKRA Has Learned

The absence of injury does not mean the presence of safety. Serious exposures often exist beneath strong-looking performance metrics, especially when near misses are underreported, misclassified or treated as a numbers exercise rather than a source of operational intelligence.

The Evolution of "the Triangle"

Later models, including Frank Bird's work in the 1960s and the behavioral extensions that followed, expanded the concept but did not remove the risk of oversimplification. The most useful modern interpretation is not "reduce the base and the apex will follow." It is "recognize which signals reveal serious exposure, then act with discipline and urgency."

Proper Uses of Near Miss Reporting

When properly designed and implemented, near miss reporting systems serve multiple safety functions. The following sections provide insight into evidence-based applications that distinguish effective programs from performative compliance.

Near Misses as a Leading Indicator

Traditional safety metrics, such as Total Case Incident Rate (TCIR), Total Recordable Incident Rate (TRIR), Lost Workdays (LWD) and similar lagging metrics, measure harm after it has occurred. They reveal that a system has failed but provide limited guidance on where and why failure will likely occur next.

However, near miss data functions as a leading indicator—a signal of the conditions and system vulnerabilities that have not yet caused harm but will without the right types of intervention. A 2021 Safety Management Trend Report survey found that 55% of occupational health and safety specialists regard near misses as an integral part of their key performance indicators (KPIs). The National Institute for Occupational Safety and Health (NIOSH) researchers (have additionally found that an increase in near miss reports, when accompanied by effective corrective action, is associated with a reduction in high-severity incidents.

The distinction between leading and lagging indicators is not merely technical but reflects a philosophical shift from reactive to proactive safety management, from asking “What went wrong?” to asking “What could go wrong?”

What DEKRA Has Learned

The strongest near miss programs do more than log events. They help leaders identify where critical controls are weak, where work is drifting from design and where SIF potential exists even when no one has been hurt.

Root Cause Analysis & Systemic Learning

Near misses, when properly investigated, are uniquely positioned for root cause analysis because they preserve the system in a pre-failure state. Unlike actual incidents, where evidence may be destroyed, witnesses traumatized and the scene altered in emergency response, near misses allow learning that examines causal factors in relative completeness.

ISO 45001 Clause 10.2 mandates root cause analysis for incidents and near misses, requiring organizations to determine the causes, evaluate contributing factors, identify similar potential occurrences, and implement corrective actions aligned with the hierarchy of controls. Common tools include 5 Whys, fishbone diagrams, fault tree analysis, and event and causal factor charting.

The 2020 NIOSH analysis of a mining aggregates study found that, of 167 valid near misses in a single quarter, 26% were classified as critical risk and 30% as high risk, indicating that near misses are not simply minor events but frequently represent exposures to SIF potential that were avoided by luck and not design.

ISO 45001

ISO 45001 is explicit in its treatment of near misses. Clause 10.2 requires organizations to establish, implement, and maintain a process for reporting, investigating, and taking action on incidents.

Key requirements include:

- *Timely reaction to incidents and implementation of immediate corrective actions*
- *Root cause evaluation with employee participation*
- *Scheduled review of existing safety and health risk assessments*
- *Documentation and communication of findings to relevant employees and stakeholders*
- *Monitoring the effectiveness of corrective actions*
- *Management system changes where necessary*

Critically, ISO 45001 notes that near miss reporting and investigation without delay allow exposures to be mitigated as soon as possible. Therefore, the standard treats near misses not as a supplementary metric but as a primary mechanism of the continuous improvement loop. Despite this mandate, compliance often remains procedurally based, meaning organizations document near misses to satisfy audit requirements without ensuring that the data drives meaningful event learning or systemic change.

Myths vs. Reality

Near miss programs often fail because leaders and employees carry different assumptions about what reporting is meant to accomplish. Reframing these assumptions is essential to shifting from compliance activity to meaningful exposure reduction.

The most effective organizations do not view near misses as a counting exercise. They view them as signals that help leaders understand exposure before a serious outcome forces attention.

Misuses & Misunderstandings

The ways in which near miss programs fail are not typically from a lack of implementation but from misuse and misunderstanding in one of the following five categories.

As a Punitive Tool

Perhaps the most damaging misuse of near miss programs is the weaponization of the data, whether intentional or not, into a mechanism for discipline. When employees are disciplined for reporting near misses, the reporting system rapidly collapses. Whether the discipline is real or perceived, the consequences are equally detrimental.

Myth	Reality
<i>More near miss reports automatically mean a safer workplace.</i>	<i>Reporting volume alone does not reduce risk. Learning, corrective action and exposure reduction do.</i>
<i>Every near miss should be treated equally.</i>	<i>Near misses with SIF potential deserve greater urgency, deeper review and stronger governance.</i>
<i>Low injury rates mean risk is low.</i>	<i>Serious exposures can exist even when recordable rates look excellent.</i>
<i>Near miss reporting is mainly a measurement tool.</i>	<i>Near miss reporting is a learning system that reveals drift, weak controls and system vulnerability.</i>
<i>Near misses are usually caused by worker mistakes.</i>	<i>The most useful near misses often point to system, process, equipment, leadership or cultural factors.</i>
<i>The goal is to collect more reports.</i>	<i>The goal is to understand what the reports reveal and reduce the exposures that matter most.</i>

In 2012, the American Society of Safety Professionals (ASSP) published an article that found that fear of punishment or retaliation was the most significant barrier to near miss reporting across construction site studies. Employees recounted experiences at employers where reporting safety issues, including near misses, led to being given undesirable assignments, essentially punishing safety communications. At the same time, leadership reported anxiety about whether an increase in near miss reports would make them appear “less safe” to senior leadership and executives.

In 2023, ScienceDirect published research on near miss reporting in hospitals, and the authors found that staff near miss reporting behavior is highly influenced by management’s response. When management is ineffective with follow-through, reporting predictably declines, which is consistent with employees’ perceptions that reporting does not result in improvement is the primary driver of underreporting.

Organizations that punish near miss reporting, intentionally or not, are effectively paying to suppress safety intelligence. Every unreported near miss is a missed opportunity to learn and prevent future injury or a fatality. The payment, or cost, comes to fruition at the incident scene, in the courtroom and in the minds of friends, families and co-workers.

The Numbers Game

There are two real failure modes. In organizations that reward reporting volume, employees and supervisors may report trivial events to inflate the numbers, diluting meaningful signals with noise and overwhelming investigation and event learning processes. In organizations that treat near miss counts as negative indicators, suppression occurs and the absence of reports is mistaken for the absence of exposure.

Both failure modes are especially dangerous for SIF prevention. A single near miss involving an uncontrolled energy source, vehicle interaction, confined space entry, work at height or bypassed critical control may carry more preventive value than dozens of low-consequence observations. The relevant question is not “How many near misses were reported?” but “What did we learn, what changed and what exposures were reduced as a result?”

What DEKRA Has Learned

A healthy reporting system measures quality over quantity. Useful indicators include pSIF potential identified, corrective action strength, critical control verification, recurrence reduction, time to closure and whether lessons were shared across sites.

There are two real failure modes here. In organizations that reward near miss reporting volume, employees and supervisors may report trivial events to inflate numbers, diluting the signals with noise and creating data that is of low value, overwhelms effective investigations and event learning processes, and obscures genuine precursor events, especially to the detriment of SIF prevention processes. In organizations that treat near miss counts as a negative metric because they are viewed as poor safety performance, suppression occurs, and the absence of reports is mistaken for the absence of exposures. Additionally, organizations that have incentive programs that inadvertently discourage reporting are a systemic driver of near miss program failure, requiring a look at not only how frontline behaviors are shaped by incentives but also management behavior.

Heinrich’s Law is Predictive

One of the most persistent misunderstandings is the treatment of Heinrich’s ratio as a predictive formula rather than a descriptive model. Many organizations apply these ratios, or one of the other models, as predictive solutions, expecting that addressing 300 near misses will predictably prevent one fatality, when the empirical evidence suggests the relationship between near miss frequency and serious injury is far more complex and context dependent.

Research published in Risk Analysis in 2018 reviewed Heinrich’s safety triangle using data from 25,000 mining establishments and determined that there is no consistent evidence that reducing minor incidents directly reduces fatalities. The research goes on to state that while minor incidents may precede more significant events, that does not mean that the former caused the latter. While the incident types may share systemic causes, the causal chain is not as direct as the triangle implies.

The attraction to Heinrich’s theory is its assumed “ease of use” with the general perception that one need only know the number of lower severity injuries or illnesses to make predictions about higher severity events.

Inconsistent Classification

The absence of a shared definition for near misses, as noted in the Definitions section, is a foundational issue. When organizations fail to train employees and leadership on a consistent, precise definition, several roadblocks appear:

1. *Employees underreport because of uncertainty about whether an event qualifies as a near miss.*
2. *Leadership applies inconsistent judgment based on organizational culture, incentives, personal risk tolerance or self-interest.*
3. *Incident investigators classify events differently across departments, sites and time periods, making trend analysis unreliable.*

Research published in *Safety Science* in 2004 documented systemic biases in incident reporting databases in the chemical industry, primarily from inconsistent application in near miss reporting. Most importantly, these biases are not random but are predictably skewed toward underreporting when there are perceived personal risks and skewed toward overreporting when there is perceived organizational benefit.

One of the most critical misunderstandings of near miss

program management is the interpretation of low near miss reporting as an indicator of safety success. Often, organizations will celebrate their safety performance when they see fewer near miss reports, when in reality they have either (1) succeeded in achieving genuinely safe operations, which is less likely, or (2) succeeded in driving reporting underground, which is more likely.

Without understanding the organization's culture and the leadership that shapes that culture, it is nearly impossible to distinguish which of these two factors is true. An organization that reports zero near misses in a quarter, versus one that reports 500, is not necessarily safer. In fact, the exact opposite may be true. The former may be less honest, less aware and more punitive. The latter may have a stronger culture, adopt a learning perspective and have stronger true safety performance.

Normalization of deviation can also play a significant role and lead to flying blind. When employees normalize near misses that occur, especially around SIF potential exposures, they begin to perceive those near misses and exposures as the way the work is done. They begin to accept the risk as a standard until it finally catches up to them or a co-worker. Normalization of deviation is particularly dangerous when it occurs around critical exposures, where consequences are severe but infrequent.

Solutions & Best Practices

While organizations often struggle with near miss program management, frameworks and principles for success have existed since the 1970s. Additionally, contemporary safety science, also known as Safety 2.0, provides guidance on how organizations can achieve success in this information-rich environment.

Success in Near Miss Management: ASRS (Aviation Safety Reporting System)

The most successful and long-lasting near miss reporting system is arguably the Aviation Safety Reporting System (ASRS), which was established as a joint partnership between NASA and the Federal Aviation Administration (FAA) in 1976. ASRS's founding was kick-started by the 1974 air incident in which a TWA flight crashed into a Virginia mountain, killing 92 people. The investigation revealed that a United crew escaped the same fate, even though they were on the same approach at the same location just six weeks earlier; however, that information never made it to TWA.

As a result, the decision to share near miss information was deemed significant for preventing future failures that had previously resulted only in a close call. ASRS was designed to close that gap through three core principles that have governed it since inception:

- 1. *Voluntary reporting*
- 2. *Confidentiality*
- 3. *Non-punitive immunity*

In the years since, the ASRS has collected more than 1.9 million safety reports. Research has shown that the system directly contributed to 14 regulatory and procedural changes in its first decade of operation, with near miss data providing insights that would never be seen at the operator or airline level.

ASRS provides proof that establishing a reporting framework that is confidential and non-punitive, provides evidence of change to the reporter, and allows for the compilation of data to conduct trend analysis results in higher-quality and higher-volume near miss reporting. These are free lessons that proactively address exposure before catastrophe strikes.

ASRS provides the most compelling and referenced empirical evidence that effective near miss programs can transform safety culture when they are built on psychological safety, confidentiality and organizational learning versus accountability and compliance. ASRS demonstrates that reporting system design—not employee willingness—is the primary driver of reporting effectiveness.

Safety 2.0: Just Culture, HOP & HRO

In a Just Culture, an employee who reports a near miss resulting from an honest mistake is supported, not punished. An employee who engaged in at-risk behavior is coached, not disciplined. Only reckless behavior that willfully or deliberately disregards the safety of self and others warrants a disciplinary response. This structure protects accountability while promoting safety intelligence.

The principles of Human and Organizational Performance (HOP) provide a structured approach to near miss management, based on five core principles.

Near miss management is essential to High Reliability Organizations (HROs) through the treatment of near misses as evidence of system vulnerability, resulting in a swift and urgent response. HRO principles for near miss management include:

- *Treating every near miss as a signal for potential SIF or catastrophic failure,*
- *Resisting the urge to associate every near miss with human behavior,*
- *Empowering the front line to report near misses and participate in the event learning process, and*
- *Designing systems that can fail safely.*

<i>Errors are normal</i>	<i>Mistakes are inherent to being human. Systems must be designed to anticipate, tolerate and mitigate human error.</i>
<i>Blame fixes nothing</i>	<i>Assigning blame prevents systemic learning and drives reporting underground. Understanding the contributing factors is more important than finding fault.</i>
<i>Behavior is a result</i>	<i>Organizational and cultural factors (e.g., procedures, equipment, staffing, time pressure) are where near misses are primarily found. Employee behavior is often responding to the conditions created.</i>
<i>Learning is crucial</i>	<i>Organizations must actively seek to learn from near misses through structured approaches (e.g. governance, exposure reduction teams).</i>
<i>Leaders set the tone</i>	<i>What leaders do or do not say sets the tone for how near misses will be treated and contribute to the overall safety culture.</i>

Technological Considerations

Near miss program design must make it easy for employees to report and provide reassurance of the value of reporting. Technological considerations should include:

- Anonymous or confidential reporting systems to increase reporting rates.
- Mobile & digital reporting tools that are simple and readily accessible are more easily adopted.
- Short reporting windows with reasonable deadlines for reporting improves reporting frequency.
- AI incorporation to assist with trend identification.
- Structured feedback systems that provide acknowledgement of receipt, investigation status and corrective actions in a timely manner increases the value proposition for near miss reporting.
- Ability to tag and prioritize SIF potential events.

Implementation Framework

The following framework provides an evidence-based roadmap for implementing or redesigning a near miss reporting program within an organization. Establishing a structured approach to near miss program management will allow for clarity, consistency and the building toward commitment to reducing harm for self and others, what safety is truly all about.



Define & Align	Establish a precise shared definition for near misses. Ensure calibration and alignment amongst leadership.
Design the System	Create simple easy-to-use reporting mechanisms. Integrate into existing EHS platforms.
Build Psychological Safety	Communicate non-punitive policy consistently and credibly. Recognize & reward reporting behavior
Investigate Meaningfully	Apply systematic root cause analysis in incident investigation and event learning. Identify human error vs. systemic failure.
Close the Loop	Communicate investigation findings and corrective actions to stakeholders. Publish trend data.
Measure Correctly	Use near miss quality as the KPI, not quantity. Monitor corrective action completion rate and recurrence reduction.
Continuously Improve	Conduct periodic audits and develop improvement plans.

▶ *Conclusion*

The evidence is clear; near miss programs that are voluntary, confidential, non-punitive, actionable, and feedback rich will improve safety outcomes

▶ *Closing*

Near misses are not issues, they are intelligence. They are free lessons which world class organizations utilize to their benefit, building resilience versus mere compliance.

Mindset shift: Instead of “How many near misses did we collect this month?”, change the questions to “What did we learn? What did we change? How do we know it was effective?”

Ready to Strengthen Your Near Miss Program?

Near miss reporting is only valuable when it leads to meaningful learning, corrective action and measurable exposure reduction. DEKRA can help your organization evaluate how near misses are defined, reported, investigated and acted on—then build a practical, non-punitive system that turns early warning signals into safer outcomes..

Let's talk Strategy:



Learn More

Contact us today to discuss how DEKRA can support your near miss reporting strategy, strengthen safety culture and help prevent serious injuries and fatalities

Connect with Us:

Email us at osr.info.us@dekra.com
Call us: +1-805-646-0166 or visit
[DEKRA.us/consulting](https://www.dekra.us/consulting)

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