

A Practical Approach for ADVANCING SAFETY MANAGEMENT SYSTEMS

By Chinonso Godwin Okoyeanchie

Many organizations rely on reactive safety practices that focus on injury rates, incident investigations and regulatory compliance after harm has occurred. This may satisfy minimum legal requirements but can fail to prevent serious injuries and fatalities and systemic failures (Dekker, 2014).

This article examines the limitations of reactive safety management systems (SMSs) through a real-world organizational scenario and proposes a practical approach for advancing SMS maturity. Emphasis is placed on operationalizing leading indicators, strengthening frontline engagement, integrating risk-based decision-making and embedding safety into everyday work processes. The approaches discussed are designed to be understandable to early-career safety professionals while offering meaningful advancement strategies for experienced practitioners.

Structural & Cultural Drivers

Despite sustained advances in occupational EHS, many organizations continue to operate within predominantly reactive safety paradigms shaped by both structural and cultural influences. Structurally, safety performance is often defined and monitored through lagging indicators such as recordable injury rates, lost-time incidents and workers' compensation costs (Hollnagel, 2014). These metrics are frequently embedded in corporate dashboards, leadership scorecards and external reporting requirements, reinforcing the perception that safety success is demonstrated by the absence of injuries rather than the presence of effective risk controls (Hollnagel et al., 2006).

Organizational systems further reinforce reactivity through compliance-driven processes. Audits, inspections and investigations are commonly scheduled around regulatory cycles or initiated in response to incidents, creating episodic attention to safety rather than continuous engagement. In such environments, resources and leadership focus intensify following adverse events, corrective actions are assigned, and retraining is implemented often without sustained examination of system design, workload demands or operational pressures that contributed to the event (Hollnagel, 2014).

Culturally, reactive systems are reinforced when safety is viewed as a specialized function owned primarily by the safety department rather than a shared organizational responsibility. Frontline workers may perceive safety reporting as punitive or futile if past concerns have not resulted in meaningful change. In turn, supervisors may prioritize production continuity over proactive risk identification, particularly when

performance expectations are narrowly defined (Hopkins, 2006).

Reactive safety systems are not inherently ineffective; incident investigation, regulatory compliance and corrective action tracking remain essential SMS components. However, when these elements form the foundation rather than a subset of the system, organizations struggle to anticipate emerging risks, manage operational variability and prevent low-frequency but high-consequence events (Dekker, 2014). Advancing beyond reactivity requires a deliberate shift in both organizational mindset and system design, one that values learning, foresight and shared accountability as indicators of safety performance (Manuele, 2013).

The Common Starting Point: Incident-Driven Safety Management

Consider a midsize manufacturing organization operating multiple production lines with a strong emphasis on meeting daily output targets. The organization maintains written safety policies, conducts annual training and tracks recordable injuries. Safety meetings are held primarily after incidents, and audits are driven by regulatory calendars rather than operational risk (Dekker, 2014).

In this environment, safety success is defined as “no injuries this month,” and failure is defined as “someone got hurt.” Near misses are rarely reported, supervisors view safety as the responsibility of the safety department, and frontline workers hesitate to raise concerns that could slow production. When incidents occur, investigations focus on employee behavior, retraining is prescribed and work resumes (Manuele, 2013).

This scenario is not unusual. It represents a common plateau in SMS maturity where compliance exists but resilience does not.

Event-Based Safety Management Systems

An event-based SMS remains common across many industries, particularly in organizations where safety performance is primarily evaluated through incident rates, regulatory outcomes and post-event corrective actions. In these systems, safety attention is activated largely in response to adverse events such as injuries, near misses, equipment damage or regulatory findings. While incident investigation and compliance response are necessary components of an effective safety



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program, overreliance on event-driven triggers constrains an organization's ability to prevent serious harm (Dekker, 2014).

These systems depend heavily on lagging indicators, which describe historical outcomes rather than current conditions. Periods of low injury frequency may create a false sense of security, mask-

ing the presence of serious hazards, degraded controls or increasing operational risk. As a result, organizations may interpret the absence of incidents as evidence of system effectiveness, even when underlying vulnerabilities remain unaddressed (Hopkins, 2006).

Learning within event-based systems is similarly constrained. Organizational improvement is often initiated only after loss has occurred, effectively requiring failure as the price of insight. Corrective actions frequently emphasize individual behavior, rule compliance or retraining, while broader system contributors such as task complexity, production pressure, staffing levels, equipment design and organizational decision-making receive limited attention. This narrow focus can result in repeated incidents with similar root causes (Dekker, 2014).

Frontline workers in event-based systems are commonly positioned as recipients of rules rather than contributors to risk intelligence. Opportunities to capture early warning signals, near-miss information and operational feedback are underutilized, limiting the organization's capacity to recognize and manage risk in real time (Hopkins, 2006).

Advancing beyond event-based safety requires a deliberate shift toward proactive risk identification, continuous learning and system-focused analysis, enabling organizations to improve safety performance without relying on harm as the primary driver for change.

Leadership Transitions & Organizational Restructuring

Leadership transitions, mergers, acquisitions and organizational restructurings represent periods of heightened uncertainty and increased risk within organizations. During these transitions, established safety practices, informal controls and communication pathways are often disrupted as reporting relationships change and strategic priorities are reassessed (Dekker, 2014). Even well-functioning SMSs can weaken if expectations, authority and accountability for risk management are not clearly reaffirmed.

An advanced SMS recognizes leadership change as a critical occasion requiring deliberate safety reinforcement rather than passive continuity. Newly appointed leaders and transitioning managers play a pivotal role in shaping safety culture

through early decisions, messaging and behaviors. Clear articulation of safety expectations, confirmation of risk ownership and continuity of reporting mechanisms help prevent ambiguity that may otherwise discourage hazard reporting or weaken compliance with critical controls (Hopkins, 2006).

Visible leadership engagement during restructuring is particularly influential. Participation in safety meetings, presence in operational areas and direct engagement with frontline workers demonstrate that safety remains a core organizational value amid change (Reason, 2000). Such actions reinforce trust and signal that productivity pressures or financial restructuring do not supersede worker protection. When leaders consistently follow through on reported concerns and allocate resources to manage identified risks, safety credibility is preserved during uncertain periods.

Organizational restructuring also presents opportunities for system improvement. An advanced SMS uses these moments to reassess roles, streamline responsibilities and integrate safety more effectively into new organizational designs (Manuele, 2014). Reviewing safety governance structures, decision-making authority and escalation pathways ensures that risk management responsibilities remain clear and functional.

By proactively addressing safety during leadership transitions and organizational change, organizations maintain system stability, prevent erosion of safety controls, and reinforce a culture where safety is embedded in leadership practice rather than dependent upon individual personalities.

Operational Changes & Process Modifications

Operational changes, including modifications to equipment, materials, staffing levels, production targets, technologies or workflows, represent some of the most risk-intensive periods within an organization. These transitions introduce uncertainty, increase task variability, and often invalidate assumptions embedded in existing procedures and safeguards. Hazards during change rarely arise from a complete absence of controls; rather, they emerge when controls that were effective under previous conditions no longer align with the new operational reality (Reason, 2000).

An advanced SMS explicitly recognizes change as a leading indicator of elevated risk and treat it as a formal trigger for structured risk evaluation. Rather than processing changes solely through administrative approval channels, mature systems integrate safety reviews into change planning and execution (Dekker, 2014). Techniques such as management of change, task-based risk assessments, and pre-startup safety reviews enable organizations to systematically examine how altered conditions may affect hazard exposure, human performance and reliability of controls (Manuele, 2014).

Frontline involvement is particularly critical during process modifications. Workers and

supervisors possess practical knowledge of how tasks are actually performed and how new demands may introduce work-arounds, time pressure or unanticipated interactions between people, equipment and materials. Incorporating their input during design, commissioning and early implementation phases allows organizations to identify weak signals and control gaps before incidents occur (Hopkins, 2006).

Effective safety management during operational change also requires post-implementation verification. Advanced systems monitor early performance indicators (e.g., deviations from standard work, near-miss trends, feedback from affected personnel) to confirm that risk controls function as intended (Manuele, 2014). By treating change as an ongoing risk-management process rather than a one-time event, organizations reinforce the principle that safety must evolve in parallel with operations, supporting both worker protection and operational reliability.

Workforce Onboarding & Skill Development

Workforce onboarding and role transitions represent recurring and influential opportunities to advance an SMS. New employees, temporary workers and individuals assuming new responsibilities often face elevated risk due to unfamiliar tasks, equipment and organizational norms (Manuele, 2014). Traditional onboarding approaches frequently rely on classroom-based orientation and rule dissemination, which may satisfy compliance requirements but are insufficient for developing the practical risk competence required in real work environments.

A mature SMS extends onboarding beyond initial training sessions by integrating safety learning into early task assignments, mentoring relationships and routine supervision. New workers benefit most when safety expectations are reinforced through guided exposure to actual job tasks, supported by experienced mentors who model safe decision-making and adaptive risk control (Hopkins, 2006). This approach allows workers to understand not only what the rules are, but why they exist and how they apply under varying operational conditions.

Effective skill development emphasizes hazard recognition, situational awareness and judgment rather than rote memorization of procedures. Workers are encouraged to identify changing conditions, recognize when risk is increasing, and communicate concerns without fear of reprisal. Performance feedback during the onboarding period plays a critical role, enabling supervisors to correct unsafe assumptions early and reinforce desired behaviors before informal workarounds become normalized (Dekker, 2014).

Advanced systems also recognize onboarding as a two-way learning process. Feedback from new workers often reveals gaps between written procedures and actual practice, highlighting system

weaknesses that may be overlooked by experienced personnel (Hopkins, 2006). Capturing and acting on this feedback strengthens organizational learning and improves system design.

By treating onboarding and skill development as continuous, risk-focused processes rather than one-time events, organizations reinforce shared responsibility for safety and establish a foundation for sustained, high-performance safety outcomes.

Embedding Safety into Organizational Decision-Making

Advancing an SMS requires a deliberate transition from compliance-oriented activities toward proactive, risk-informed and learning-centered practices that are embedded in everyday operations (Zwetsloot et al., 2013). An effective SMS extends beyond written policies and periodic training to function as dynamic frameworks that continuously identify, evaluate and control risk across changing operational conditions. In mature systems, safety is treated as an integral component of organizational decision-making, influencing how work is planned, executed and reviewed rather than serving as a parallel or reactive function (Wachter & Yorl, 2014).

Central to this advancement is the systematic use of forward-looking indicators that reflect the

BUILD A PROACTIVE SAFETY MANAGEMENT SYSTEM

- Shift from reacting to preventing.** Focus safety efforts on identifying, assessing and controlling risks before incidents occur rather than measuring success solely by injury rates or regulatory compliance.
- Track meaningful leading indicators.** Monitor proactive measures such as the quality of risk assessments, effectiveness of critical controls and timely hazard correction to identify problems before they result in harm.
- Build safety into everyday work.** Incorporate safety checks into routine work processes, discuss emerging risks during shift handovers and empower supervisors to stop work when risk thresholds are exceeded.
- Engage frontline workers.** Create systems that encourage near-miss reporting, involve employees in hazard assessments and demonstrate that worker feedback leads to visible improvements.
- Learn from systems, not just mistakes.** Investigate incidents by examining workload, operational pressures, process design and other system factors instead of focusing primarily on individual behavior.
- Implement improvements incrementally.** Pilot new risk-based practices in high-risk areas, train supervisors in proactive decision-making, and frame safety improvements as drivers of operational reliability and business performance.



Organizations that move beyond compliance and embrace practical, system-focused approaches are better positioned to prevent serious injuries and fatalities, sustain operational excellence and protect both people and organizational value.

quality of risk controls, the reliability of critical processes, and the organization's capacity to anticipate failure. These indicators enable organizations to detect weak signals such as deviations from standard work, degradation of safeguards or increasing task complexity before adverse outcomes occur (Hopkins, 2006). When integrated into routine management reviews, such measures support timely intervention and reinforce accountability at all organizational levels.

Equally important is the incorporation of structured learning mechanisms that operate independently of incidents. An advanced SMS emphasizes continuous learning through near-miss analysis, task observations and operational feedback, allowing organizations to improve without incurring harm. This learning is most effective when it focuses on how work is actually performed under real-world conditions, acknowledging variability, competing demands and system constraints (Hollnagel, 2014).

Leadership and workforce engagement further distinguish advanced systems from basic implementations. Management commitment is demonstrated not only through policy endorsement but through visible involvement in risk discussions, allocation of resources to control critical hazards, and reinforcement of reporting without fear of reprisal. Frontline personnel are recognized as essential contributors to system intelligence, providing insight into emerging risks and the practical effectiveness of controls (Hopkins, 2006).

Ultimately, a mature SMS functions as a living system—one that adapts to operational change, prioritizes prevention over reaction, and aligns safety

objectives with organizational performance and resilience. By embedding risk management, continuous learning and shared responsibility into daily operations, organizations move beyond compliance toward sustainable safety excellence.

Wachter & Yorl (2014) outline five key elements of a practical approach to advancing SMS.

1) Reframe safety as risk management. A foundational step in advancing an SMS is reframing safety from "injury prevention" to "risk management." This shift emphasizes the identification, assessment and control of hazards before harm occurs. Practical actions include:

- mapping critical tasks and processes to identify where failure would result in serious injury or fatality
- prioritizing risks based on severity and exposure rather than frequency alone
- aligning safety objectives with operational risk, not just regulatory requirements

This approach positions safety as a core business function rather than a reactive support activity.

2) Operationalize leading indicators. Many organizations acknowledge the value of leading indicators but struggle to implement them in a meaningful way. Effective leading indicators are observable, actionable and linked to risk. Examples include:

- quality of lockout/tagout verifications rather than the number of procedures written
- completion and effectiveness of pretask risk assessments for nonroutine work
- timely correction of identified hazards, not just the number of inspections conducted

Leading indicators should be reviewed alongside operational metrics, reinforcing the message that safety performance matters as much as productivity.

3) Integrating safety into daily work. Advanced SMS models embed safety into routine operations rather than treating it as a separate activity. This integration reduces reliance on reminders and enforcement. Practical integration strategies include:

- incorporating safety checks into standard work instructions
- using shift handovers to discuss abnormal conditions and emerging risks
- empowering supervisors to pause work based on risk criteria rather than injury history

When safety becomes part of how work is done, compliance becomes a by-product rather than a constant struggle.

4) Strengthen frontline participation. Frontline workers possess the most accurate understanding of task variability and real-world constraints. Advancing an SMS requires structured mechanisms to capture and act on this knowledge. Effective practices include:

- near-miss reporting systems that emphasize learning rather than blame
- worker involvement in job safety analysis and control selection
- feedback loops that demonstrate how reported concerns lead to tangible improvements

Participation must be supported by visible management action; otherwise, reporting systems quickly lose credibility.

5) Move from blame to system learning. An advanced SMS focuses on understanding why work makes sense to workers at the time it is performed. This perspective shifts investigations away from individual fault and toward system design. Key practices include:

- examining workload, time pressure and resource constraints during incident reviews
- identifying mismatches between written procedures and actual work
- using trend analysis to detect weak signals before serious events occur

This learning-oriented approach strengthens organizational resilience and trust.

Implementation Challenges

Organizations often encounter resistance when advancing beyond reactive safety. Common challenges include limited leadership understanding, competing production priorities and cultural inertia. These challenges can be mitigated by:

- framing safety improvements in terms of operational reliability and business continuity
- piloting new approaches in high-risk areas before organization-wide rollout
- training supervisors in risk-based decision-making rather than rule enforcement alone

Progress does not require perfection; incremental improvements can yield significant risk reduction over time.

Conclusion

Advancing an SMS is not achieved through additional documentation, increased audit frequency or repeated training cycles alone. While these elements remain necessary, they are insufficient when applied in isolation. Meaningful advancement requires a fundamental shift in how organizations understand and manage safety from a retrospective focus on injury outcomes to a proactive, risk-based approach that emphasizes anticipation, learning and system reliability. In mature systems, safety performance is evaluated by the organization's ability to recognize and control risk before harm occurs, rather than by the absence of reported injuries (Manuele, 2014).

Organizations that successfully advance their SMSs embed risk awareness into operational planning and everyday decision-making. Safety considerations influence production scheduling, maintenance planning, staffing levels and change management processes, ensuring that risk is managed where work is designed and executed (Reason, 1997). Continuous learning mechanisms such as near-miss analysis, operational feedback and trend monitoring allow organizations to improve without relying on adverse events as catalysts for change. These mechanisms strengthen organizational resilience by enabling adaptation to evolving conditions, technologies and workloads (Manuele, 2014).

Frontline engagement remains a defining characteristic of high-performing safety systems. When workers are treated as knowledgeable partners in risk identification and control, organizations gain access to real-time system intelligence that cannot be captured through procedures or metrics alone. Leadership commitment is demonstrated through visible involvement, consistent follow-through on reported concerns, and reinforcement of a just culture that prioritizes learning over blame (Hollnagel, 2014).

Ultimately, advancing an SMS is an ongoing process rather than a fixed endpoint. Organizations that move beyond compliance and embrace practical, system-focused approaches are better positioned to prevent serious injuries and fatalities, sustain operational excellence and protect both people and organizational value. An SMS that functions as a living, adaptive system integrated with operations and supported by shared accountability provides the foundation for long-term, high-performance safety outcomes. **PSJ**

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