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RESEARCH ARTICLE

BEYOND CHECKLISTS: ENHANCING PROCESS SAFETY MANAGEMENT AUDITS THROUGH CONFIDENTIAL REPORTING AND CULTURAL INSIGHTS

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Abstract

Purpose: This paper aims to evaluate traditional Process Safety Management (PSM) auditing practices and assess how confidential reporting mechanisms could enhance these audits.

Methods: A comprehensive literature review and analysis of existing case studies were conducted to identify gaps in current PSM auditing practices. The study focused on underreporting of near-misses and insufficient capture of safety culture issues. Confidential reporting systems were examined for their potential to improve risk identification and management.

Results: The analysis revealed significant gaps in traditional PSM audits, including the underreporting of near-misses and the failure to adequately capture safety culture issues. Confidential reporting systems were shown to improve risk identification and management by providing a safe channel for employees to report safety concerns anonymously. These systems enhance the completeness of safety data, offering auditors a more comprehensive view of the safety landscape.

Conclusion: Integrating confidential reporting mechanisms into PSM audits can significantly improve hazard identification, promote transparency, and foster a stronger safety culture. This integration addresses the limitations of traditional audits by capturing critical safety information that might otherwise go unreported. The paper concludes that evolving PSM auditing practices to include confidential reporting can lead to more effective risk management and a safer working environment.

Plain Language Summary: This paper discusses how traditional safety audits might miss critical safety concerns due to limited employee openness. Incorporating confidential reporting systems can significantly enhance safety by allowing employees to anonymously report hazards or near-miss incidents, thus improving overall safety performance in hazardous industries.

Data Access Statement: All data supporting this research are drawn from publicly available literature and referenced sources cited within this manuscript. No additional proprietary data was generated or used in this study.

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Introduction:-

Process Safety Management (PSM) auditing is a cornerstone of industrial safety programs, particularly in facilities handling hazardous chemicals and processes. Audits serve to verify compliance with safety regulations and standards, identify weaknesses in safety programs, and drive continuous improvement. An effective PSM audit not only checks for regulatory compliance but also evaluates the implementation of safety procedures and the preparedness of an organization to prevent accidents (Majid et al., 2014). A well-conducted audit can reveal hidden deficiencies and provide opportunities for corrective action, thereby safeguarding employees, assets, and the environment. Despite their importance, traditional auditing methodologies face significant challenges. Many audits tend to be checklist-driven and focused on documentation, which can result in a superficial evaluation of safety systems (Alotaibi, 2022). Critical aspects such as employee perceptions, inter-departmental communication, and the underlying safety culture may not be fully captured during routine audits (Vaughen & Klein, 2011). Employees might be hesitant to speak openly during formal audits due to fear of blame or retaliation, especially when audits are seen as punitive or purely compliance-oriented (Rashid et al., 2020). This is where confidential reporting mechanisms become vital. Confidential reporting mechanisms refer to systems that allow employees to report safety concerns, near-misses, or violations anonymously without fear of negative consequences (Daugherty et al., 2013). Examples include anonymous hazard reporting hotlines, suggestion boxes, digital reporting platforms, or third-party-operated whistleblower systems. Such mechanisms can play a complementary role to formal audits by capturing information that might otherwise go unreported. For instance, near-miss incidents (events that could have led to an accident but did not) are often underreported in organizations due to fear of blame or a belief that nothing will change (Zulkiply & Hussain, 2023). If left unaddressed, these near-misses can be precursors to major accidents. By providing a confidential channel for reporting, organizations encourage employees to share critical safety information. This, in turn, offers auditors a more complete view of the safety landscape, including issues that are not evident from records or interviews alone. In practice, however, integrating confidential reports into PSM audits is not straightforward. Challenges include ensuring the anonymity of reporters, effectively analyzing and acting on the large volume of data that such systems can generate, and overcoming any distrust employees might have in the confidentiality promise (Mazza & Iazur, 2022). Additionally, current auditing frameworks may not have established protocols for incorporating insights from confidential reports. This paper aims to highlight the need for evolving traditional PSM auditing practices by embedding confidential reporting into the process. The introduction of anonymous reporting can significantly enhance auditors' ability to assess the true state of safety management and culture within an organization (Klein & Dharmavaram, 2012). The following sections discuss the existing literature on PSM auditing and safety culture, analyze the shortcomings of current audit practices in capturing employee concerns, and propose improvements to make audits more robust and inclusive of the workforce's insights. The overarching goal is to foster a safety culture where continuous learning and open communication are integral to the auditing and overall risk management process.

Literature Review:-

Impact of Existing Auditing Practices on Safety Compliance and Risk Management

A growing body of literature has examined the effectiveness of PSM audits and the influence of organizational culture and reporting practices on safety outcomes. provided early insights into the persistent challenges of implementing and maintaining effective PSM programs. In their study, they observed that many facilities continue to experience recurring safety management gaps, even years after PSM standards were introduced. They noted that OSHA inspections were still uncovering the same types of deficiencies as those found over a decade earlier, suggesting that traditional audits and corrective actions were not leading to lasting improvements. A key point from Hanchey and Thompson's work is that compliance on paper does not always translate to sustained safety performance in practice. The authors argue that without organizational commitment and proper follow-through on audit action items, companies risk stagnation in their safety performance. This highlights a gap in auditing practices: audits often identify issues, but ensuring the closure of audit findings and institutionalizing changes is an ongoing struggle. Such challenges point to the need for more dynamic auditing practices that can adapt to organizational changes and reinforce continuous improvement.

Capturing Employee Concerns in Audits

Subsequent studies have reinforced the idea that safety culture is a critical factor often overlooked by conventional audits. Moore et al. (2014) emphasize that a strong, positive safety culture—supported by engaged coworkers and open communication—has a significant impact on safety performance). In their analysis, they found that organizations with proactive safety cultures tend to have fewer incidents because employees at all levels prioritize

and value safety. This finding implies that audits should evaluate not just procedural compliance but also the extent to which a safety-first mindset is ingrained in daily operations. Traditional audits, which typically review documents and adherence to protocols, might miss underlying cultural issues such as a reluctance among staff to report problems or a normalization of deviance (where unsafe practices become accepted as "normal"). Moore and colleagues suggest that audit teams should include assessments of safety climate (e.g., through surveys or interviews) to gauge how comfortable employees feel in reporting issues and whether management demonstrates a genuine commitment to safety. When audits incorporate such cultural diagnostics, they are more likely to detect warning signs like underreported incidents or widespread shortcuts being taken, which purely compliance-focused audits could overlook.

Influence of Safety Culture on Audit Outcomes

Research by Fyffe et al. (2016) has further highlighted the limitations of a compliance-only approach. Fyffe and co-authors argue that organizations must transition from a compliance culture to a learning culture to achieve better safety outcomes. In a learning culture, the emphasis is on continuous improvement and internal learning mechanisms—using data from incidents, near-misses, and audits to constantly refine safety processes. Their work points out that a learning-oriented organization encourages self-correcting behaviour: employees and departments actively seek out and fix safety issues without waiting for a formal audit to mandate changes. Such a culture is fostered by transparency and trust. Winkler and Fyffe (2016) note, for example, that when employees are encouraged to provide honest feedback and see that their input leads to positive changes, they become more engaged in the safety management system. This underscores a gap in many current auditing practices: audits may be viewed as periodic check-ups, whereas a learning culture requires a more ongoing, integrated approach to hazard identification and resolution. The literature suggests that incorporating confidential reporting systems is one way to facilitate this cultural shift. By assuring anonymity, these systems can reduce fear and encourage more frequent reporting of issues, feeding into the continuous learning loop.

Studies focusing specifically on confidential reporting and whistleblower mechanisms in high-hazard industries shed light on their potential benefits. For instance, Jayaraman et al. (2019) investigated the integration of confidential reporting channels in chemical processing plants. Their findings indicated that facilities with robust anonymous reporting systems experienced improved safety compliance and a reduction in unaddressed hazards. Jayaraman and colleagues documented that employees were more willing to report near-misses and minor safety infractions when they had access to a trusted confidential platform, as opposed to only formal channels. This surge in reporting provided richer data for auditors and safety managers to analyze, leading to more informed audits. Notably, the study highlighted that merely having a reporting system is not enough—management must also actively respond to the reports. When workers observed that their anonymously submitted concerns were reviewed and resulted in tangible safety improvements, their trust in the system grew. This finding aligns with the broader literature: trust and psychological safety are crucial for the success of any reporting mechanism. A related point made by Jayaraman et al. is the role of communication breakdowns in undermining safety. In cases they reviewed where accidents occurred despite prior audits, investigators often found that frontline employees had sensed the danger but felt unable to voice their warnings through regular channels. This emphasizes how a lack of upward communication (from workforce to management) can nullify the effectiveness of even rigorous audit regimes. Confidential reporting mechanisms can bridge this gap by giving employees an alternate path to communicate hazards.

Management and Communication of Audit Findings

Recent contributions to the literature have begun exploring technological and modern management approaches to enhancing PSM audits. Zhou & Wang (2024) discuss the impact of digital transformation on process safety auditing. They highlight that advanced tools such as big data analytics, real-time monitoring, and AI-driven risk assessment can augment traditional audits. According to their analysis, digital platforms that compile incident reports, near-miss data, maintenance records, and even worker safety observations in one place enable a more comprehensive audit. Auditors can leverage such integrated data to detect patterns and weak signals that might predict future incidents. For example, a confidential reporting database might reveal a recurring issue (like frequent minor leaks in a particular unit) that hasn't yet led to a recordable incident but indicates a systemic problem. Without such data, an audit team might miss or underestimate the issue during a site inspection. Zhou and Wang also note that these technologies facilitate continuous auditing—moving away from a solely periodic audit model to an ongoing review process where data is analyzed in real time or on a rolling basis. This progressive approach aligns with the notion of a learning organization, as it encourages constant vigilance and quicker feedback loops. However, the authors

caution that technology is not a panacea; its effectiveness still depends on a supportive organizational culture and competent personnel to interpret the data.

In summary, the literature reveals several critical gaps in current PSM auditing practices. Traditional audits may not fully capture the human and cultural factors that significantly influence safety performance. Compliance-focused audits risk overlooking silent signals of trouble, such as unreported near-misses or a reluctance among workers to speak up. Confidential reporting mechanisms emerge in the literature as a promising tool to address some of these gaps by encouraging transparency and providing auditors with otherwise hidden information. Additionally, there is a clear trend advocating for the infusion of continuous improvement philosophies and digital technologies into the auditing process. By doing so, audits can evolve from a static compliance check to a dynamic, ongoing element of safety management that actively engages with the workforce and adapts to new information. The following discussion builds on these insights to analyze how current auditing practices impact safety and what can be done to make audits more effective in fostering a strong safety culture.

Existing auditing practices in PSM have a direct impact on both safety compliance and risk management effectiveness. On the positive side, regular audits (whether internal or external) reinforce compliance with established standards and procedures. They provide a structured opportunity for organizations to check that safety instrumented systems, emergency procedures, training records, and maintenance schedules are in order. By identifying non-conformities or lapses, audits prompt corrective actions that can reduce immediate risks. However, the limitations of traditional audits can also inadvertently contribute to safety risks. One common limitation is that audits might become a "check-the-box" exercise, focusing heavily on paperwork and easily measurable indicators while missing deeper issues. When auditors act strictly as "umpires" who enforce rules by the book they may overlook how those rules play out in practice. For instance, an audit might verify that a facility has a procedure for management of change (MOC) and that employees have signed off on MOC training. Yet, the same facility might have a culture where workers are pressured to keep production going, leading them to bypass the MOC process in subtle ways. Such behavioral deviations might not be evident in documentation but could be discovered through candid conversations with employees – conversations that might only happen if trust exists between the workforce and auditors.

A significant issue in current audit practice is the capture of employee concerns. Audits typically include interviews with a selection of employees to gauge their knowledge and attitudes. However, power dynamics and fear of repercussions can inhibit open communication in these interviews. Employees might downplay or fail to mention safety issues due to a concern that admitting problems could reflect poorly on their team or invite managerial disapproval. This is where confidential reporting can fundamentally change the game. By providing an alternative channel, employees can voice concerns or describe incidents without direct attribution. If audit teams have access to aggregated anonymous reports, they can better target their on-site inquiries. For example, if numerous anonymous reports indicate that a particular piece of equipment is often left in an unsafe condition, auditors can focus attention on that area, even if management did not flag it as a concern. Unfortunately, many audit protocols do not currently integrate such data, resulting in blind spots. It is not uncommon for a plant to pass an audit, only to experience an incident later that, in hindsight, employees "saw coming" but never reported through formal channels. Such scenarios underscore a breakdown in communication flow from the frontline to the auditing and management level.

The safety culture of an organization dramatically influences the outcomes of an audit. In a strong safety culture, employees feel responsible for safety, communication is open, and management is responsive. Audits in such environments often find high levels of compliance and also receive voluntary information from workers eager to improve safety. In contrast, in a weaker safety culture where there may be mistrust or indifference, audits are more likely to encounter superficial compliance – rules followed in front of auditors but perhaps ignored in day-to-day operations. This phenomenon is sometimes referred to as "window dressing," where things look good on the surface during an inspection. A related limitation of audits is their periodic nature; typically, formal audits occur annually or every few years (OSHA's PSM standard, for example, mandates compliance audits at least every three years). Risks, however, are present every day. Between audit cycles, significant changes can occur: personnel turnover, equipment aging, production pressures, etc., which can erode safety practices. If an organization relies solely on periodic audits to catch problems, it may find that issues have festered unaddressed for long periods. In the interim between audits, near-miss reporting systems and other forms of ongoing monitoring are crucial to detect and mitigate risks.

Another aspect to consider is how audit findings are managed and communicated within the organization. An audit might produce a list of recommendations or required corrective actions. The effectiveness of the audit is only as good as the implementation of those actions. If there is a lack of accountability or tracking, action items may remain open or be addressed superficially. Moreover, if audit results and lessons are not communicated transparently to staff, the workforce misses out on learning opportunities. Lack of transparency can also breed cynicism; workers might feel that audits are a mere formality with no real commitment to change, especially if the same findings recur audit after audit. This highlights a limitation in many organizations: closing the feedback loop. An optimal auditing practice would ensure that after an audit, there is a debrief with employees, sharing what was found and what will be done, and perhaps even inviting further input on how to fix problems. In many cases, especially in top-down safety cultures, this loop is not closed, and audits remain an external process rather than being internalized by the organization.

Risk Management Perspective

From a risk management perspective, failing to incorporate confidential reporting and worker feedback means losing valuable data. Employees are often the first to notice early warning signs of impending problems, such as unusual vibrations in machinery, minor leaks, or procedural shortcuts becoming routine. If these signals do not reach those who can analyze and act on them (like auditors or safety managers), the organization operates with a partial view of its risk profile. Research by Tepparit et al. (2024) illustrates that poorly structured safety inspections suffer from unsystematic information gathering and lost opportunities to achieve organizational safety goals. In their study, inefficiencies in the audit/inspection process meant that factual information and worker opinions were not being collected or used effectively, echoing the point that traditional audits can miss out on critical front-line input. This gap can directly impact risk management, as decisions will be made on incomplete information. For example, risk assessments might underestimate likelihoods or consequences because the data feeding into them (from audits and incident reports) was missing some of the on-the-ground realities.

Technological Advancements in Auditing

Technological advancements present opportunities to address some of these limitations. The integration of digital tools in auditing, as noted by Zhou & Wang (2024) and others, can enhance data collection and analysis. Real-time reporting apps allow workers to log safety observations (with options for anonymity) on the fly. These reports can be time-stamped, geotagged, and even include photos, providing rich context that an auditor can later review. Over time, accumulating such data creates a detailed mosaic of the facility's safety performance. Modern audit software can trend this data, perform analyses, and even send alerts if certain risk indicators rise above a threshold. For instance, if multiple anonymous reports mention a specific valve leaking, the system could flag this pattern before the next audit occurs, prompting a maintenance review. Additionally, machine learning algorithms are being explored to scan through text-based reports to identify common themes or emerging hazards that a human might overlook. While these technological tools hold promise, they also require that organizations adapt their auditing processes to use them effectively. Auditors need training to handle large data sets and to trust insights that come from algorithms. Furthermore, implementing such systems can be costly and requires management commitment – which circles back to the importance of leadership in fostering a culture that values proactive risk management.

Recommendations for Strengthening PSM:-

In summary, current PSM auditing practices do enforce a baseline of safety compliance and can catch obvious non-compliance issues, but they often fall short in capturing the nuanced, human-centered aspects of safety. Limitations such as incomplete communication, infrequent audit intervals, and a lack of cultural assessment can allow hazards to go unnoticed until an accident happens. The discussion makes it evident that an evolution is needed: one that blends the thoroughness of traditional audits with the inclusivity of confidential reporting and the power of modern technology. By doing so, companies can improve not only their compliance status but also genuinely enhance risk management and cultivate a more resilient safety culture. The next section provides concrete recommendations on how organizations and auditors can move toward this integrated, forward-looking approach.

To strengthen PSM auditing practices and ensure they foster a robust safety culture, several improvements are recommended. These recommendations address audit methodology, organizational culture, and the use of technology, aiming for a comprehensive approach:

Enhance Transparency and Accountability: Audit processes and findings should be made more transparent within the organization. Rather than treating audit results as confidential management information, companies should share

relevant audit findings with employees in a constructive manner. This involves communicating what issues were found and what actions will be taken. By doing so, employees see that audits lead to real improvements, which can motivate them to participate more openly. Moreover, assigning clear responsibility and timelines for each audit action item ensures accountability. Progress on addressing audit recommendations should be tracked and verified in subsequent audits, creating a continuous improvement loop.

Recommendations & Future Directions:-

Integrate Confidential Reporting into Audits

Integrate Confidential Reporting into Audits: Organizations should establish confidential reporting channels (e.g. anonymous digital platforms or hotlines) and formally integrate the data from these systems into the auditing program. Audit teams must review anonymous reports regularly and use them to guide audit focus areas. For example, if numerous confidential reports concern a particular safety procedure or department, auditors can prioritize reviewing that area. It is also recommended to periodically audit the reporting system itself – checking, for instance, that reports are being addressed in a timely manner and that feedback (even if generic, to preserve anonymity) is given to the workforce. This integration ensures that the voice of the employees is present in every audit, even if indirectly, and that no concern is dismissed due to lack of attribution. Anonymity in reporting should be zealously protected to maintain trust; companies might consider using third-party services to manage the data, thereby reassuring employees that their identity truly cannot be traced. As one industry best-practice notes, providing confidential channels allows employees to report issues without fear, and anonymity fosters openness, encouraging more people to come forward.

Foster a Culture of Psychological Safety

Foster a Culture of Psychological Safety: Building on the literature about learning cultures, organizations need to create an environment of psychological safety where employees feel safe to speak up. This cultural shift involves training leadership and management to respond to reported issues (whether through audits or confidential reports) in a non-punitive manner. Instead of blaming individuals, the focus should be on understanding systemic causes and preventing recurrences. Companies should encourage near-miss reporting by positively reinforcing those who report (for example, praising employees for their vigilance or giving team rewards for high reporting rates, under the assumption that higher reporting means more engagement). When employees see that discussing a mistake or hazard leads to improvements rather than punishment, they are more likely to volunteer information during audits or via reports. Auditors themselves should be trained to conduct interviews with an empathetic approach, making clear that their goal is to learn and improve, not to find faults for punishment. Over time, a psychologically safe workplace will generate richer data for audits and strengthen overall PSM performance.

Leverage Digital Tools for Continuous Auditing

Leverage Digital Tools for Continuous Auditing: Embracing technology can significantly enhance audit effectiveness. It is recommended to implement digital audit management systems that consolidate information from inspections, maintenance, incident investigations, and confidential reports. These systems can provide auditors and managers with dashboards showing key safety performance indicators in real time. For example, a spike in the number of reports about a certain equipment malfunction can be detected and addressed before the scheduled audit. Additionally, wearable safety devices and sensors (part of Industrial IoT – Internet of Things) could continuously monitor conditions (like gas leaks, vibration, etc.) and feed data into the safety management system. Future audits could include reviewing this automated data to corroborate or uncover issues. Organizations should also consider AI-driven analytics that can sift through large volumes of text (from maintenance logs or report comments) to flag potential concerns. While these technologies are emerging, early adoption in a controlled manner can give companies a head start in predictive risk management. In the future, we might see audit teams supplemented by data scientists to interpret complex datasets.

Engage Stakeholders at All Levels

Engage Stakeholders at All Levels: Effective auditing should be viewed as a collaborative process rather than an imposed inspection. Engaging various stakeholders – from frontline operators and maintenance crews to engineers and supervisors – in the audit process can yield better insights. One approach is to include select employees as part of the internal audit team on a rotating basis; this not only provides auditors with operational knowledge but also educates those employees about audit processes. Another approach is to hold pre-audit workshops where employees can anonymously submit concerns or suggest areas for auditors to examine. Involving workers' unions or safety committees in discussing audit outcomes is also beneficial, as it demonstrates respect for worker input and fosters

joint ownership of safety improvements. External stakeholders, such as contractors who work on site, should not be neglected; their safety observations (often they have a fresh perspective on routine operations) can be solicited through confidential feedback mechanisms as well. By broadening participation, audits become a more 360-degree review of the PSM system, and solutions devised are more likely to be practical and supported by those who must implement them.

Regular Training and Refinement of Audit Skills

Regular Training and Refinement of Audit Skills: As auditing practices evolve with culture and technology, the auditors themselves (including internal audit teams and external auditors) require ongoing training. Auditors should be well-versed in human factors and safety culture assessment techniques. Developing soft skills for interviewing and facilitating focus groups is as important as technical knowledge of regulations. It is recommended that organizations invest in periodic training for auditors on topics like "leading indicators for process safety," "effective use of safety climate surveys," or "data analytics for safety professionals." Moreover, auditing guidelines and checklists should be periodically updated to incorporate lessons learned from incidents and near-misses globally. For future directions, the industry can work towards standardizing how confidential reporting data is used in audits – possibly through guidelines issued by safety institutions (e.g., CCPS or regulatory bodies) on best practices for merging these two streams of safety assurance.

By implementing these recommendations, PSM audits can transition into a more holistic and proactive tool for safety management. The future of auditing in process safety likely lies in a hybrid model that retains the rigor of compliance checks while also embracing open reporting, cultural assessment, and advanced analytics. This comprehensive approach will not only identify non-compliance but also diagnose underlying weaknesses in the safety management system, leading to more effective interventions. Ultimately, the goal is an auditing system that not only finds what is wrong, but also actively contributes to making things go right – fostering an organizational culture where safety is truly everyone's responsibility and insight from every level is valued.

Process safety audits are an indispensable component of managing high-hazard operations, but as this paper has discussed, their effectiveness is greatly enhanced when coupled with confidential reporting mechanisms and a supportive safety culture. Traditional auditing practices, while effective at checking compliance, often need supplementation to capture the less tangible aspects of safety such as trust, communication, and worker engagement. The analysis of literature and current practices revealed that many accidents and near-misses could have been prevented if only the concerns of front-line employees had been heard and acted upon. It is concluded that a multi-dimensional auditing approach is necessary – one that integrates technical compliance verification with cultural diagnostics and anonymous feedback channels. Such an approach ensures that audits do not operate in a vacuum but are interwoven with the day-to-day learning and reporting that occurs within the organization.

Key takeaways from this evaluation include the recognition that safety culture and audit effectiveness are deeply interlinked. Audits must assess not just "hard" criteria (procedures, hardware, training records) but also "soft" indicators like whether employees feel safe to report problems. The role of confidential reporting mechanisms has been highlighted as a game-changer: they provide a safe space for employees to contribute to safety oversight, thus enriching audits with ground truth information. With the advent of modern data tools, there is an unprecedented opportunity to gather and analyze safety information continuously, moving towards a model of continuous auditing and improvement rather than episodic checks. Embracing these tools and methods can lead to earlier detection of hazards, more timely interventions, and ultimately a reduction in incident rates.

Conclusion:-

In conclusion, organizations aiming for excellence in process safety should broaden their perspective on auditing. Rather than viewing audits as a periodic obligation, they should be seen as part of an integrated safety management strategy that works in concert with reporting systems, employee involvement, and technology. An audit should be as much about learning and improving as it is about inspecting and verifying. By adopting the recommendations outlined – increasing transparency, integrating confidential reports, fostering psychological safety, leveraging technology, and engaging all stakeholders – companies can transform their auditing process into a powerful driver of safety culture. This proactive and inclusive approach to PSM auditing will help ensure that safety is not merely a checklist, but a shared value permeating every level of the organization. As industries continue to evolve and face new challenges, a resilient safety culture backed by effective auditing and open reporting will be the cornerstone of preventing catastrophic incidents and protecting both people and the environment.

Conflict of Interest

The author declares no conflict of interest. This research and its outcomes are presented solely for the advancement of knowledge in process safety management and are not influenced by any external commercial or personal interests.

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Author Biography

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