

SAFETY CLIMATE IN A STATE-OWNED CONSTRUCTION COMPANY: GAP ANALYSIS AND PRACTICAL RECOMMENDATIONS

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ABSTRACT

Safety is a mandatory requirement in Indonesia's construction industry. As part of continuous improvement efforts, a state-owned construction company conducted a safety climate assessment to identify implementation gaps, and formulate recommendations for improvement. This study utilizes a quantitative survey of 1,165 respondents and interprets the measured value in the NOSACQ-50 index to identify the implementation gap of the assessed company's safety climate. The assessment result indicates that the company's safety climate is in the "Good" category (mean 4.31) with strengths in formal rules and communication. However, the assessment shows that the assessed company's safety climate scores a lower point in the workplace condition, individual risk appreciation, and leaders' commitment categories, which implies a pattern of "strong formality, weak reality." The persistence of unsafe conditions (UC) despite high scores suggests that safety aspects are not yet embedded in the production system design. Procedures alone are not enough to encourage mature safety implementation. Individual awareness of safety risks in the field is also necessary, and this awareness must be actively promoted by top management.

KEYWORDS

Safety, safety climate, lean construction.

INTRODUCTION

Indonesia's construction industry remains a key pillar of the economy, contributing approximately 9.8% to GDP in 2025, making it the fourth-largest sector in Indonesia (Badan Pusat Statistik, 2025). The construction industry continues to face persistent occupational health and safety (OHS) challenges worldwide, particularly in complex, high-risk, and large-scale projects. Despite advances in technology, regulations, and management systems, construction remains characterized by high accident rates, unsafe working conditions, and varying safety performance (Zhou et al., 2015).

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From a Lean Construction perspective, these issues are not only ethical and regulatory but also represent significant sources of waste that undermine production stability (Koskela, 1992). Unsafe conditions result in disruptions, rework, stoppages, injuries, and the loss of skilled labor, all of which negatively impact project flow and reliability (Saurin et al., 2008). Lean Construction emphasizes the design and management of production systems that maximize value, minimize waste, and continuously improve performance through learning and collaboration. Within this paradigm, safety is increasingly recognized as fundamental to reliable workflows rather than merely a secondary or compliance-based function (Tommelein, 1998; Salem et al., 2006).

Safety culture maturity in the Indonesian construction industry is shaped by a multi-faceted framework comprising leadership commitment at the strategic level, clarity and consistency of safety communication, the design and implementation of rules and procedures, physical and psychological work environment conditions, technical and safety competence of personnel, and active involvement of workers in safety processes (Andi, 2008). Zohar (2002) found that the dimensions of leadership, safety climate, and safety priorities set by management influence injury rate, emphasizing the importance of aligning values and practices to support safe daily behavior. A strong safety culture supports predictable operations by ensuring that workers are physically and psychologically safe, empowered to identify risks, and involved in problem-solving processes. Empirical studies show that the implementation of a near-miss management system can change dimensions of safety culture (e.g., leaders' commitment, investigation, training) (Pedrosa et al., 2025).

In contrast, a weak safety culture often reflects deeper systemic problems such as misalignment between management intentions and operational practices, production pressures that override safety considerations, and limited opportunities to learn from near-miss incidents and unsafe conditions (Dekker, 2007). In Lean thinking, these constructs align closely with core principles such as respect for people, continuous improvement, and management's commitment to building effective systems rather than blaming individuals (Howell & Ballard, 1998; Dekker, 2007).

In construction companies, safety climate is recommended as a proactive key indicator for assessing the effectiveness of OHS systems and triggering corrective actions (Schwatka et al., 2016). However, many construction companies still struggle to translate formal safety policies into consistent behaviors at the project level, resulting in a gap between stated values and actual practices (Goh & Binte Sa'adon, 2015). In the Indonesian construction context, rapid industry growth, project complexity, and workforce diversity further aggravate these challenges (Zhou et al., 2015). Large organizations often implement comprehensive OHS management systems, yet recurrent unsafe conditions, near misses, and inconsistent safety behaviors persist across projects (Lestari et al., 2020). This suggests that technical controls which is safety system such as formal safety procedures, policies, safety equipment are insufficient (Choudhry et al., 2007) and that deeper attention to the maturity of safety culture is needed (Lestari et al., 2020). Organizations tend to prioritize the development of technical controls and formal safety rules while neglecting to build a real safety culture. They fail to make safety awareness become a natural part of how workers think and act every day. This line of reasoning reflects the Safety-I paradigm, which focuses on preventing things from going wrong through compliance with technical controls and formal procedures, rather than understanding why things go right in everyday work. This study proposes the integration of the Safety-II perspective, which emphasizes the system's ability to succeed (things go right) under complex and uncertain conditions.

This paper addresses the gap by assessing the safety climate in an Indonesian state-owned construction company, where no prior study has linked safety climate with Lean Construction, particularly within a state-owned enterprise that serves as the backbone of Indonesia's

construction sector. The scope of this paper is confined exclusively to the safety climate. Other aspects of safety, such as safety behavior, safety culture, or safety outcomes, are not examined in this study. By incorporating safety as an integral component of the production system, this study contributes to the growing body of knowledge on Lean Construction and offers practical insights for organizations seeking to achieve safer, more reliable, and continuously improving project delivery.

LITERATURE REVIEW

SAFETY CLIMATE CONCEPT

Within the construction sector, the safety climate is widely regarded as a valuable leading indicator for forecasting future safety performance. Studies indicate that a positive safety climate is strongly associated with higher levels of safety compliance and participative behaviors, while showing a negative relationship with workplace accident rates (Clarke, 2006; Zohar, 2002).

Safety climate refers to the collective perceptions of employees regarding safety priorities, practices, and behaviors at a particular moment, whereas safety culture represents the more deeply embedded and long-lasting values and norms that influence organizational decision-making (Guldenmund, 2000).

SAFETY IN A LEAN CONSTRUCTION PERSPECTIVE

Lean Construction aims to maximize value and minimize waste (Koskela, 1992; Ballard & Howell, 1998) through continuous improvement (Salem et al., 2006). In this paradigm, workplace accidents and unsafe conditions are viewed as significant forms of waste because they cause flow interruptions, rework, and loss of skilled labor (Howell & Ballard, 1998). Integrating safety into Lean systems means that safety is not only about obeying regulations. More importantly, safety is a necessary condition for stable and reliable operations. (Koskela, 2000). A safe work environment allows workers to focus on tasks without psychological or physical distractions (Christian et al., 2009), which in turn supports a reliable workflow. Therefore, a strong safety climate is considered an enabler for the successful implementation of Lean Construction (Nahmens & Ikuma, 2009).

Workplace accidents lead to losses in cost, time, reputation, and human life, all of which directly interrupt the project's value stream (Moaveni et al., 2019). What needs further emphasis, however, is the proactive side of safety. In Lean Construction, this proactivity is driven by the principle of Kaizen, or continuous improvement (Ikuma et al., 2011). Ikuma and colleagues (2011) demonstrated that applying Safety and Lean Integrated Kaizen (SLIK) not only boosted productivity by as much as 55% but also reduced or eliminated safety and ergonomic hazards, including trip hazards, pinch points, and back strain. Kaizen encourages everyone in the organization; from top managers to frontline workers; to constantly identify potential dangers and propose small but meaningful safety improvements (Enshassi et al., 2019).

Flores Peluffo & Martínez Aires (2024) demonstrated that Prevention through Design (PtD) and Lean Construction can reduce workplace accidents by up to 20% and optimize operational efficiency by eliminating hazards at the source.

SAFETY CLIMATE IN THE INDONESIAN CONSTRUCTION INDUSTRY

The construction industry in Indonesia, particularly large-scale projects managed by State-Owned Enterprises faces unique challenges. Despite widespread adoption of Occupational Safety and Health Management Systems and ISO 45001:2018, there is often a gap between formal policies ("what is written") and on-the-ground practices ("what is done") (Andi, 2008).

Previous studies in Indonesia identified dimensions such as leaders' commitment, safety communication, and worker engagement as critical factors. However, their implementation is often hampered by production pressures and tight deadlines, which can shift safety priorities (Sunindijo et al., 2019).

SAFETY CLIMATE MEASUREMENT (NOSACQ-50)

One valid and reliable instrument for measuring safety climate is the Nordic Occupational Safety Climate Questionnaire (NOSACQ-50). This instrument was developed by an international team of researchers and has been widely used in various industries, including construction (Kines et al., 2011).

The NOSACQ-50 measures safety perceptions across several key dimensions, which can be grouped into perceptions of leaders' (commitment, prioritization, empowerment) and perceptions of the workgroup (coworker commitment, risk awareness). Using this instrument allows organizations to make specific diagnoses of areas requiring intervention, distinguishing between dimensions that are already strong (e.g., formal rules) and dimensions that are still weak (e.g., personal risk appreciation) (Kines et al., 2011).

SAFETY LEADERSHIP

According to Wu, Chen, & Li (2008), safety leadership is defined as an interactive process between leaders and subordinates, through which leaders can guide employees toward achieving organizational safety targets via organizational or individual factors.

Based on the meta-analytic review conducted by Clarke (2013), transformational leadership has been shown to make a positive contribution to improving employee safety behavior. The study confirms that this leadership style not only encourages compliance with procedures but also effectively fosters employees' voluntary participation in safety initiatives.

RESEARCH METHODS

To ensure comprehensive assessment of the safety climate, the research employed a triangulation strategy (Carter et al., 2014). Data were gathered and cross-validated from five distinct sources: a standardized questionnaire, focus group discussions (FGDs), in-depth interviews, direct field observations, and a review of relevant OHS documents. This methodology combines multiple types of data. This combination helps overcome the weaknesses of any single data source. As a result, it produces a more detailed and trustworthy picture of current OHS conditions. This approach is recommended in classic safety climate research (Zohar & Luria, 2005). The primary method involved collecting data through questionnaires without any intervention or changes to the respondents' work systems. The questionnaires were administered to 1,165 respondents, accounting for 8% of the total workforce of 14,125 and used a 5-point Likert scale. The questionnaire approach was used to capture the perceptions, views, and experiences of individuals involved in the organization. Data collection used a cross-sectional design and was conducted once in a single time period in September 2025.

Respondents were selected only if they had worked at the company for at least three months, as this duration was considered sufficient to ensure an adequate understanding of the implementation of the Occupational Safety and Health Management System within company. The operational structure of the organization is organized into three divisions, each aligned with a distinct business sub-sector. The Infrastructure 1 Division manages infrastructure operations across the islands of Sumatra and Java. The Infrastructure 2 & Building Division (INBD) oversees infrastructure projects in Kalimantan, Sulawesi, Bali, Nusa Tenggara, and Papua, in addition to managing all building-sector operations nationwide. The EPCC Division is responsible for Engineering, Procurement, Construction, and Commissioning activities

throughout Indonesia. This diverse range of respondents, spanning business units and project locations, provides a comprehensive and representative picture of the overall safety conditions at the organization level. The research was conducted from September to October 2025. Data were collected during the period of September 8th–21st, 2025.

Table 1: Dimensions of Safety Climate that were developed and adopted from (Lestari, 2020)

No	Dimension	Definition
1.	Leaders' commitment	The seriousness of management in demonstrating commitment to OHS.
2.	Safety Priority	The extent to which safety is prioritized above production/cost/time targets.
3.	Communication & Campaign	Openness and clarity of communication regarding hazards, procedures, and incidents.
4.	Procedures of OHS	The existence, clarity, and consistency of OHS rules/procedures implementation.
5.	Supportive Environment	A supportive work environment and a culture of reminding one another.
6.	Participation of employee	Worker participation in OHS activities such as hazard identification, meetings, and inspections.
7.	Individual Safety Prioritization	The individual views that safety is a personal need and responsibility.
8.	Individual Risk Appreciation	Workers' awareness of risks and the consequences of unsafe acts (UA).
9.	Workplace Conditions	Physical and non-physical work conditions that affect safety.

Respondent comprehension was reinforced through a socialization session conducted by the research team and the inclusion of clear definitions within the questionnaire form. Additionally, a contact person was appointed to respond to participant inquiries during questionnaire completion while refraining from any intervention in the responses themselves.

Qualitative and triangulated data were then obtained through in-depth interviews with top management and focus group discussions (FGDs) with work groups (lower, middle, and upper levels). A total of nine top management members—representing the Board of Directors (BOD), BOD-1, and BOD-2—participated in in-depth interviews. Their average years of experience with the company was 20 years, with each interview lasting one hour.

Focus Group Discussions (FGDs) were conducted with 73 participants, divided into four job clusters: Project Manager, Site Manager (non-HSE), Non-HSE Staff, and Site Manager (HSE). Each job cluster was represented across three sub-business units, resulting in a total of 10 FGD groups. Each FGD session lasted two hours.

In the final stage, secondary data were examined through document review and field observations for validation. Secondary data were obtained through a review and examination of documents, including company records and findings from previous studies relevant to the present research. This literature study served as a reference to support observation and data analysis. The secondary data collected from internal company procedures; the implementation of the Occupational Health and Safety (OHS) program; and monthly project performance reports on OHS and the environment.

Field observations were conducted to obtain data on the implementation of Occupational Health Safety practices across projects and to support the safety climate findings. Risk Containment Audits (RCA) were employed to observe unsafe acts and unsafe conditions in infrastructure, building, and EPCC projects, with each observation lasting five hour.

Questionnaire results were analyzed using the NOSACQ-50 index, and quantitative scores were reinforced with interview and FGD findings to identify gaps or correlations. The questionnaire results were analyzed using the NOSACQ-50 index with the criteria in Table 2.

Table 2: Nordic Occupational Safety Climate Questionnaire or NOSACQ-50 index that is adopted from www.nfa.dk (Safety Climate Questionnaire - NOSACQ-50, 2024)

	Value	Interpretation
< 2.70	1. Low Level	Represents a poor level of performance with a substantial need for improvement.
2.70 – 2.99	2. The level is quite low	Indicates a moderately low level, suggesting that improvements are necessary.
3.00 – 3.30	3. Good enough	Reflects a reasonably good level, though some improvement is still required.
>3.30	4. Good level	Demonstrates a strong level of performance that can be sustained and further developed.

Table 3: Sample characteristics of the questionnaire

Profile	Classification	Number	% per profile item
Job Level	Top Management	37	3.2%
	Middle Management	125	10.7%
	Bottom Management	686	58.9%
	Vendor Partner	317	27.2%
Age (years)	18-24	95	8.2%
	25-34	452	38.8%
	35-44	406	34.8%
	45-54	190	16.3%
	55-64	22	1.9%
Years of experience in company	< 1	151	13%
	1-5	313	26.9%
	6-10	338	29%
	11-15	223	19.1%
	16-20	79	6.8%
	>20	61	5.2%
Education	Elementary School	37	3.2%
	Junior High School	76	6.5%
	Senior High School	247	21.2%
	Diploma	57	4.9%
	Bachelor's Degree	624	53.6%
	Master's Degree	123	10.6%
	Doctoral Degree	1	0.1%
Division	Infrastructure 1	132	11%
	Infrastructure 2 & Building	447	38%
	EPCC	165	14%
	Head Office	421	36%

As summarized in Table 3, the demographic profile of the respondents closely reflects the company's overall operational population. The sample was dominated by bottom management, 58.9%, who directly implement occupational safety and health on projects. Educationally, more

than half of the respondents (53.6%) had a bachelor's degree, which may influence their perception and understanding of safety protocols. The age distribution indicates a workforce within a mature and stable working age range, with nearly three-quarters (73.6%) in the 25–44 age group, and a review of years of experience in company indicates that 48.1% had been with the company for 6–15 years. Organizationally, the sample provided balanced coverage, with strong representation from core operational units (Infrastructure 2 & Building Division, 38%) and strategic management (Head Office, 36%). The sample characteristics are presented in Table 3.

RESULT AND DISCUSSION

Table 4 presents the overall safety climate score and the score of each dimension. The overall average safety climate score was 4.31, which falls into the "Good" category based on the study criteria. Based on the safety climate evaluation of 1,165 respondents, the majority demonstrated a perception classified as good level, accounting for 1,141 respondents (97.9%). The remaining respondents were distributed across the following categories: good enough (16 respondents; 1.4%), low level (6 respondents; 0.5%), and quite low level (2 respondents; 0.2%). These findings indicate that positive perceptions of the safety climate have been widely internalized across various levels of the organization.

Table 4: Safety Climate assessment result in the studied company

No	Dimension	Mean
1.	Leaders' commitment	4.27
2.	Safety Priority	4.33
3.	Communication & Campaign	4.33
4.	Procedures of OHS	4.39
5.	Supportive Environment	4.34
6.	Participation of employee	4.33
7.	Individual Safety Prioritization	4.38
8.	Individual Risk Appreciation	4.24
9.	Workplace Conditions	4.22
	Overall Score	4.31

Dimensional level analysis showed relatively higher perceptions for Procedures of OHS (4.39), Safety Priority (4.33), and Communication & Campaign (4.33), indicating that formal systems and top-down messages were clearly visible. The lowest means were recorded for Workplace Conditions (4.22), Individual Risk Appreciation (4.24), and Leaders' Commitment (4.27). Even though these three dimensions still fall in the "good" category, they were selected as priority areas for improvement. This gap supports what earlier studies in Indonesia found. Andi (2008) and Lestari et al. (2020) showed that formal safety rules often do not show up in the daily work practices on projects.

Safety performance improved, as shown by fewer near misses and a lower UA:UC ratio. Near misses decreased from 258 in 2024 to 229 in 2025, while the UA:UC ratio went down from 1:20 in 2024 to 1:14 in 2025. (Monthly Project Performance Reports, 2024 - 2025). Even though the UA:UC ratio decreased, unsafe conditions still dominate over unsafe act. This means that unsafe conditions can still disrupt production and cause losses if not handled systematically.

The findings of this study provide important insights into how safety climate functions as a systemic support in the construction production system. Table 5 summarizes the results from in-depth interviews, Focus Group Discussions (FGDs), and field observations. These qualitative findings are supported by the results of the safety climate questionnaire, which identified the dimensions that need the most urgent improvement. Together, these different

sources of data show a persistent gap between the organization's formal safety rules and actual daily practices. This confirms the systemic weaknesses identified in this study. The study found that while the average safety climate was classified as “good” the identification of persistent gaps (shown in Table 5) revealed structural tensions within the system. The identified gaps within the key elements of the company’s safety system are consolidated and summarized in Table 5, where each component is strategically mapped against the corresponding safety climate dimensions of the NOSACQ-50 framework.

Table 5: Gap Analysis Key Elements of Safety System

No	Key Elements of Safety System	Current State	Target State	Gap
1.	Unsafe Condition (Workplace Condition)	The organization holds an advanced OHSMS certification; however, field findings are dominated by unsafe conditions. The ratio of unsafe acts to unsafe conditions is 1:14.	The management system functions cyclically and aligns planning (procedure development), implementation (field execution), and control (auditing and review).	Certification does not reflect actual safety performance. The documented system fails to control hazardous conditions at the operational level.
2.	Incident Control (Individual Risk Appreciation)	Workers tend to be reluctant to report hazardous conditions or incidents that have occurred.	Every hazardous condition or incident must be reported immediately.	Fear of being blamed, worry about burdening coworkers, and concern about disrupting productivity due to Stop Work Action or investigation processes.
3.	Management Consistency (Leaders’ Commitment)	OHS policy implementation is inconsistent and non-sustainable, often active only during certain periods or under external pressure.	Management demonstrated high consistency in OHS policy	There is a dynamic challenge in balancing production targets with safety priorities.

The qualitative findings from focus group discussions (FGDs) and in-depth interviews revealed that although written OHS policies and procedures received a high score (4.39), their

implementation was inconsistent and not sustainable. In Lean Construction, leadership commitment is not only shown through written policies or campaigns, but also through behaviors such as regular director walkthroughs, active problem-solving, and quick response to abnormal conditions (Liker & Convis, 2011). This gap between policy and actual action has significant organizational implications: loss of trust, underreporting incidents, and limited organizational learning (Dekker, 2007).

From a Lean Construction perspective, unsafe conditions that still exist are a form of hidden waste. These conditions directly disrupt workflow stability and operational reliability (Koskela, 1992). These findings confirm that safety cannot be separated from the production process. Safety must be built into the work from the beginning, not just consider a separate set of rules that force workers to comply. As emphasized by Spear and Bowen (1999), a Lean production system assumes that work can run as planned when workers are consistently able to carry out their tasks safely and without fear of injury. The presence of unsafe conditions on site reflects failure in system design. In other words, safety has not been included in the design of work activities, task sequences, or on-site logistics.

The key finding of this study is the gap between the decrease in the number of near miss reports and the continued high number of unsafe conditions in the field. Companies are required to adopt a new approach to interpreting safety data. Safety data should not be seen merely as reports, but as lessons learned. Based on Lean philosophy, a near miss is not just a report or a piece of data. Instead, it serves as an early warning system that should trigger continuous improvement (Pedrosa et al., 2025). Unfortunately, the findings show that the existing system is still compliance oriented rather than learning oriented. This is reflected in the interview's findings, which revealed that management tends to view UA & UC reports as an administrative burden rather than as an opportunity for kaizen (continuous improvement).

Based on the results, one of the dimensions from safety climate that needs improvement is Individual Risk Appreciation. This dimension has a gap that although workers know the safety rules, they do not always apply this knowledge to identify and manage hazards in their daily work. One basic principle of Lean Construction is "respect for people." This principle means that respect can be shown by empowering workers to take initiative to report issues during construction process, giving them the authority to do Stop Work Action, and encouraging them to take part in continuous improvement, therefore they will have sense of belonging to their workplace (Spear & Bowen, 1999).

The gap in the incident control element shows that knowing about risks does not always lead to action. This hesitation may be due to workplace culture, a hierarchical decision-making structure, or pressure to meet production targets; all of which can prevent workers from speaking up. To improve individual risk appreciation, this organization needs to create psychological safety, give workers clear authority to Stop Work Action, and reinforce that identifying hazards is a valuable contribution to production reliability, not a disruption (Dekker, 2007).

The gap found in the leadership commitment dimension indicates that leaders tend to be inconsistent in implementing workplace safety, especially when facing high pressure to meet production targets. In fact, leadership is a fundamental element that shapes safety culture, and safety leadership is an integral part of leadership itself. Safety leadership is defined as the ability of a leader to motivate members of the organization to be enthusiastic about creating a workplace safety culture (Gunawan, 2013). To achieve this, a leader must have the characteristics needed to influence others and to serve as a role model in every aspect of workplace safety, including safe work behavior (Krause, 2005).

CONCLUSION

The safety climate assessment showed that the overall level was quite good. However, beneath this good result, there was a paradox: "strong formality, weak reality." This means that while the Procedures of OHS dimension scored high, three important dimensions; Workplace Conditions, Individual Risk Appreciation, and Leadership Commitment; still lagged behind. As a result, even though safety rules have been made, unsafe conditions still occur on site. Therefore, closing this gap is an urgent need. Leaders, as key personnel, are expected to be role models who can influence the design of the work system. They must ensure that safety is integrated into construction activities from the very beginning, for example, during the tender process.

This study contributes to the understanding that poor safety implementation creates waste in Lean Construction. When a workplace accident occurs, it results in multidimensional losses, including cost overruns, schedule delays, reputational damage, and fatalities or injuries. Considering that Lean Construction is fundamentally oriented toward eliminating waste and ensuring a seamless value stream, the implementation of effective safety practices becomes a critical enabler of overall project success.

Despite these contributions, the scope and limitations of this study should be acknowledged. The research was conducted within a single state-owned construction enterprise in Indonesia, with data collected from all ongoing projects. Consequently, the findings may not be generalizable to other organizational contexts, such as private construction firms, small-scale contractors, or projects with different geographical and cultural settings. Methodologically, safety climate data were collected using a questionnaire-based survey, which captures perceptions rather than objective behavioral measures and may be subject to social desirability bias. The cross-sectional design also limits the ability to observe causal relationships or track changes in safety climate over time. Future research is encouraged to expand the scope across multiple state-owned construction enterprises in Indonesia and employ longitudinal designs. Specifically, future studies could explore how to develop safety climate into a deeper and more sustainable safety culture within these organizations. This would help researchers and practitioners understand not only how workers perceive safety, but also how safety beliefs and behaviors become embedded in daily routines over time. Addressing these limitations would further strengthen the empirical basis for integrating safety as a core component of production system design in the construction industry.

RECOMMENDATION

The recommendations to solve the gaps are Safety First Inspection and Director Walkthrough programs. On the project level, Safety First Inspection program directed by Project Manager is a proactive and structured measure to eliminate potential hazards, thereby creating safer physical workplace conditions before work begins. Findings from this inspection must be followed up by the area supervisor and serve as the basis for approval to issue a Permit to Work. On the corporate level, the routine implementation of Director Walkthrough led by the board of directors is recommended as a tangible form of top management involvement. Through direct interaction in the field, leaders not only demonstrate their commitment but also act as role models in the application of Occupational Health and Safety (OHS). The exemplary behavior of top management is considered crucial to stimulate workers' OHS awareness, hence gradually improving workers' sensitivity and appreciation of the risks around them (individual risk appreciation). Top management supports this recommendation by directly participating in field activities, thereby ensuring that the program is properly implemented and has a meaningful impact on improving HSE implementation on site.

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