THE ROLE OF MOTIVATION IN OCCUPATIONAL HEALTH AND SAFETY IN INDUSTRIAL PRODUCTION

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Abstract: The effectiveness of occupational health and safety measures in industrial production depends not only on technical protection systems, regulatory requirements, and the availability of personal protective equipment but also on employees' willingness to apply safety rules consistently in their daily work. In many production environments, safety procedures are formally established, yet their practical implementation may vary considerably among workers and departments. This difference is partly associated with the level and nature of employee motivation. The present study examines motivation as an organizational and behavioural factor influencing occupational safety performance. Particular attention is given to the relationship between financial incentives, non-financial recognition, managerial commitment, professional development, employee participation, and the formation of stable safe-working habits. Based on established motivational theories and research into safety behaviour, the article proposes an integrated motivational model for industrial enterprises. The model combines five interrelated components: economic incentives, professional development, managerial support, participatory mechanisms, and organizational recognition. A methodological approach is also proposed for assessing the effectiveness of motivational measures through indicators of safety compliance, employee participation, hazard reporting, training outcomes, and corrective actions. The analysis suggests that motivation is most effective when employees perceive occupational safety as a genuine organizational priority rather than a formal obligation. The proposed approach may be used as a methodological basis for improving occupational safety management in industrial enterprises.

Keywords: occupational health and safety, employee motivation, industrial production, safety behaviour, financial incentives, safety culture, employee participation, occupational risk management, organizational commitment

Introduction. The organization of safe working conditions in industrial production involves more than compliance with established technical standards and legislative requirements. Although protective equipment, machine guarding, ventilation systems, electrical protection, and emergency procedures are essential, their effectiveness ultimately depends on how these measures are implemented during actual production activities. Employees must recognize potential hazards, follow operating instructions, use protective equipment correctly, and respond appropriately when working conditions change.

One of the factors influencing this behaviour is motivation. In the context of occupational safety, motivation can be understood as the set of internal and external factors that encourage an employee to perform work activities in accordance with safety requirements and to take an active part in preventing occupational hazards.

The practical importance of motivation becomes particularly evident in production environments where employees repeatedly perform similar operations. Repetition may gradually lead to the perception that certain safety requirements are unnecessary, especially when previous deviations have not resulted in visible consequences. For example, a worker may temporarily remove protective equipment because it makes a particular operation less convenient. Another employee may

fail to report a minor equipment defect because production is continuing without interruption. Such situations demonstrate that knowledge of safety rules does not automatically guarantee their consistent application.

The problem is therefore not limited to the availability of instructions or the employee's awareness of potential hazards. It also concerns the reasons why a worker chooses to comply with safety requirements, whether management supports such behaviour, and whether the organization creates conditions in which safe work is practically achievable.

Previous research has established a relationship between safety climate, employee motivation, safety knowledge, and safety performance. Griffin and Neal (2000) distinguished between safety compliance and safety participation, demonstrating the importance of motivation and knowledge in explaining safety-related behaviour. Neal and Griffin (2006) subsequently examined the relationship between safety climate, safety motivation, safety behaviour, and occupational accidents over time.

These findings provide a basis for considering motivation not as an isolated psychological characteristic but as a process influenced by organizational management and the working environment.

In industrial enterprises, motivational measures are frequently associated with financial bonuses, disciplinary procedures, safety competitions, and recognition of employees who follow safety requirements. However, the effectiveness of these measures depends on their design. A reward system based exclusively on the absence of recorded accidents, for example, may unintentionally discourage employees from reporting minor incidents and hazardous conditions.

A more reliable approach requires motivation to be connected with observable preventive activities, including hazard identification, participation in safety training, timely reporting, compliance with operating procedures, and the implementation of corrective measures.

The purpose of this study is to analyse the role of employee motivation in occupational health and safety in industrial production and to develop an integrated approach for incorporating motivational mechanisms into occupational safety management.

The scientific contribution of the study lies in the proposed integration of economic, professional, managerial, participatory, and organizational motivational factors into a single framework for managing safe work behaviour.

Materials and Methods. The study employs a theoretical and analytical research design. Its methodological basis consists of scientific literature on work motivation, occupational safety behaviour, organizational climate, and safety management.

The first stage involved analysing established motivational approaches and determining their relevance to occupational safety. Particular attention was given to expectancy-based explanations of work behaviour and self-determination theory, which distinguishes between autonomous and controlled forms of motivation.

The second stage examined research concerning the relationship between safety climate, employee motivation, safety knowledge, and workplace behaviour. The findings of Griffin and Neal (2000), Neal and Griffin (2006), and subsequent studies were considered when identifying the organizational conditions that influence employees' willingness to work safely.

The third stage involved a structural analysis of motivational factors in industrial production. These factors were grouped according to their primary mechanisms of influence: economic, professional, managerial, participatory, and organizational.

The fourth stage consisted of developing an integrated motivational model. The model was designed to explain how organizational measures may influence employees' attitudes towards occupational safety and, consequently, their participation in preventive activities.

Finally, an assessment framework was developed to identify indicators that industrial enterprises could use when monitoring the performance of motivational programmes.

The study does not involve a newly conducted employee survey or industrial experiment. Accordingly, the proposed model and assessment framework should be regarded as theoretical and methodological developments requiring subsequent empirical validation.

Results. Motivation as a Determinant of Safe Work Behaviour. Motivation influences the extent to which employees are prepared to apply their knowledge and skills in practical working situations. In occupational safety, this influence is expressed through two closely related forms of behaviour.

The first is safety compliance, which refers to following established procedures, using the required protective equipment, observing operational limits, and complying with instructions. These activities represent the minimum behavioural requirements for performing work safely.

The second is safety participation. It involves activities that go beyond the direct requirements of an employee's assigned task, such as reporting hazardous conditions, suggesting improvements, assisting colleagues, and participating in workplace safety discussions.

This distinction is important for industrial production. An enterprise may achieve a certain level of formal compliance through instructions and supervision, but sustainable improvement requires employees to become actively involved in identifying and preventing hazards.

Motivation provides one of the mechanisms through which this transition can occur. When employees understand the practical value of safety measures and recognize that management takes their concerns seriously, they are more likely to participate in preventive activities.

However, the relationship between motivation and behaviour is not automatic. An employee may be highly motivated to work safely but remain unable to do so if the necessary protective equipment is unavailable or the production process does not allow sufficient time to follow the established procedure.

Therefore, motivational measures should be accompanied by appropriate technical and organizational conditions.

Intrinsic and Extrinsic Motivation in Occupational Safety. Two broad categories of motivation are relevant to the management of safe work behaviour: intrinsic and extrinsic motivation.

Intrinsic motivation develops when an employee follows safety requirements because their importance is personally recognized. In this case, safe work is associated with professional responsibility, personal well-being, protection of colleagues, and confidence in the quality of one's work.

An employee with a strong internal safety orientation does not require continuous supervision to use protective equipment or observe established procedures. These actions become part of normal professional conduct.

Extrinsic motivation, by contrast, is associated with external consequences. These may include financial incentives, additional benefits, recognition, promotion opportunities, supervisory evaluation, or disciplinary measures.

Both forms may influence workplace behaviour, but their effects depend on how they are incorporated into the organizational environment.

Financial incentives can encourage participation in safety programmes, particularly when employees see a transparent relationship between their efforts and the recognition received. Nevertheless, excessive dependence on external rewards may create undesirable outcomes if the reward criteria are poorly selected.

For example, awarding bonuses solely on the basis of the absence of registered accidents may encourage underreporting. Employees may become reluctant to report minor injuries, near misses, or unsafe conditions because such reports could negatively affect departmental performance indicators.

For this reason, incentives should be connected with preventive performance rather than the concealment or absence of negative events.

Self-determination theory provides a useful explanation of this distinction. Deci, Olafsen, and Ryan (2017) emphasize the importance of autonomy, competence, and relatedness in the development of autonomous motivation within organizations. Applied to occupational safety, these principles suggest that employees should understand the reasons behind safety requirements, possess the competence to implement them, and feel that their participation is valued by colleagues and management.

The practical objective is therefore not simply to increase the number of rewards but to develop conditions in which employees accept safe work as an integral part of their professional responsibilities.

Economic Motivation and Financial Incentives. Economic motivation is one of the most commonly used mechanisms for influencing employee behaviour in industrial enterprises. It may involve bonuses, additional payments, material benefits, and other forms of financial recognition associated with occupational safety performance.

The implementation of such mechanisms requires careful consideration of their assessment criteria.

A financial incentive system based exclusively on the absence of accidents is insufficient because it does not provide information about the preventive activities undertaken by employees. It may also create an incentive to conceal incidents.

A more appropriate system should recognize activities that contribute directly to risk reduction.

For example, an enterprise may consider the following indicators when evaluating departmental safety performance:

- timely identification and reporting of hazardous conditions;
- participation in occupational safety training;
- compliance with established operating procedures;
- correct use and maintenance of personal protective equipment;
- submission of technically justified safety improvement proposals;
- participation in workplace inspections;
- implementation of corrective measures within the employee's area of responsibility.

Financial recognition should be based on transparent criteria that are communicated to all employees in advance.

At the same time, economic incentives must not replace the employer's fundamental obligations to provide safe working conditions, maintain equipment, supply appropriate protective equipment, and organize occupational safety training.

In other words, employees should not have to earn the right to safe working conditions through additional performance or financial rewards. Incentives should recognize positive contributions beyond the minimum obligations established by law and workplace procedures.

Non-Financial Motivation and Management Commitment. Financial incentives alone cannot establish a stable safety culture. In many production environments, managerial behaviour and the quality of communication have a substantial influence on how employees interpret organizational priorities.

Non-financial motivation includes professional recognition, opportunities for development, participation in decision-making, constructive feedback, and acknowledgement of individual contributions to workplace safety.

The role of supervisors is particularly important. Employees observe how managers respond to production problems, whether safety procedures are followed during urgent operations, and whether reports of hazardous conditions lead to practical improvements.

If management demands compliance with safety requirements but repeatedly allows production targets to override them, employees may interpret safety rules as secondary requirements.

Conversely, when supervisors consistently allocate time for safe work, provide necessary resources, investigate reported problems, and recognize preventive initiatives, the organization demonstrates that occupational safety is an actual management priority.

Recognition should also be linked to specific actions. Acknowledging an employee for identifying a defective protective guard or proposing a safer method of material handling provides a clearer motivational message than general statements about good performance.

An important principle is that recognition should not create competition that discourages cooperation. Safety is a collective responsibility, and individual achievements should be evaluated without weakening teamwork or encouraging employees to conceal information.

Employee Participation as a Motivational Mechanism. Employees possess practical knowledge of production operations that may not be fully reflected in formal instructions or technical documentation. They often recognize operational difficulties, equipment irregularities, and unsafe working practices through direct experience.

For this reason, employee participation should be considered an essential component of motivational management.

Participation may be organized through regular safety meetings, workplace inspections, hazard-reporting systems, employee suggestions, and joint discussions between workers and supervisors.

The practical significance of participation lies in the relationship between responsibility and influence. When employees are allowed to contribute to the development of safety procedures, they can better understand the reasons behind those procedures and identify whether proposed measures are workable.

For instance, workers operating a production line may identify that the location of a control panel creates unnecessary movement near hazardous machine components. Their observations may lead to improvements in workplace layout or the introduction of additional protective measures.

However, participation is meaningful only when employee proposals receive an appropriate response. If suggestions are repeatedly ignored, workers may lose confidence in the reporting system.

An effective participation mechanism should therefore include three stages:

1. Identification and submission of a safety-related issue.
2. Technical and organizational evaluation of the proposed solution.
3. Communication of the decision and implementation status to the employee.

This process establishes a direct relationship between employee initiative and organizational improvement.

Proposed Integrated Motivational Model for Industrial Enterprises. Based on the analysis of motivational theories and occupational safety research, an integrated model is proposed for the development of employee motivation in industrial production.

The model consists of five interrelated components.

Component 1. Economic motivation. This component involves transparent financial recognition of employees who make demonstrable contributions to occupational risk prevention. The emphasis is placed on preventive activities rather than accident-free periods alone.

Component 2. Professional motivation. This component is based on improving employees' competence through training, practical exercises, qualification development, and opportunities to acquire additional professional skills.

Component 3. Managerial motivation. This component reflects the influence of leadership behaviour, supervisory support, feedback, and the consistency with which safety requirements are implemented in production management.

Component 4. Participatory motivation. This component encourages employees to identify hazards, report near misses, contribute improvement proposals, and participate in workplace risk assessments.

Component 5. Organizational recognition. This component involves acknowledging individual and collective contributions to safety improvement through professional recognition, internal communication, and the dissemination of effective practices.

The model assumes that motivational measures influence safety behaviour through employees' perceptions of organizational priorities, their professional competence, and their willingness to participate in preventive activities.

It is important to distinguish the proposed model from a simple reward scheme. Its central feature is the integration of internal motivation, external incentives, managerial support, and opportunities for employee participation.

The model can be adapted to enterprises of different sizes and production profiles. Its specific implementation should depend on the nature of occupational hazards, the structure of the workforce, available resources, and existing occupational safety management procedures.

Methodological Framework for Evaluating Motivational Effectiveness The implementation of motivational measures requires a system for evaluating their practical effectiveness. Without appropriate indicators, management cannot determine whether a motivational programme has improved employee participation or merely increased the number of formal activities.

These dimensions can be monitored periodically and compared with the enterprise's baseline performance.

For a more structured assessment, a composite motivational effectiveness index may be used:

$$M = w_1C + w_2P + w_3R + w_4T + w_5A + w_6L$$

Where:

- M - composite motivational effectiveness index;
- C - safety compliance indicator;
- P - employee participation indicator;
- R - hazard-reporting indicator;
- T - training and competence indicator;
- A - corrective-action implementation indicator;
- L - management commitment indicator;
- w_1-w_6 - weighting coefficients assigned to individual indicators.

The weighting coefficients should be selected according to the characteristics of the enterprise and the relative importance of each assessment dimension. They should be determined through an appropriate expert assessment or empirical analysis, with their sum equal to one.

Before calculating the composite index, the indicators must be converted to a comparable scale. Where an indicator has an inverse relationship with performance, its direction must also be adjusted.

The proposed index is a methodological tool for organizing internal evaluation. It should not be interpreted as an experimentally validated universal measure of employee motivation. Its reliability and predictive value require testing using data from actual industrial enterprises.

A particularly important methodological consideration is the interpretation of hazard-reporting data. An increase in reported near misses may indicate improved employee engagement and a more open reporting environment rather than a deterioration in safety. Therefore, reporting figures should be analysed together with the seriousness of identified hazards, the effectiveness of corrective actions, and actual injury outcomes.

Discussion. The analysis demonstrates that motivation should be treated as an integral part of occupational safety management rather than as an additional administrative measure. Its effectiveness depends on whether the organization creates conditions in which employees are both willing and able to work safely.

The relationship between safety climate and employee motivation has been examined in several influential studies. Griffin and Neal (2000) established a conceptual distinction between safety compliance and safety participation and identified the role of safety knowledge and motivation in safety performance. Neal and Griffin (2006) further demonstrated that changes in group-level safety climate were associated with subsequent changes in individual safety motivation and behaviour.

More recent research has also examined the motivational processes connecting organizational climate with safe and health-promoting employee behaviour. The findings reported by the 2020 study on small businesses indicate that different motivational forms may mediate the relationship between organizational safety climate and employee behaviour.

These findings support the view that motivational mechanisms should not be reduced to financial rewards. The working environment, managerial support, employee involvement, and the perceived value of safety procedures also contribute to the development of safe behaviour.

A potential weakness of traditional incentive programmes is their dependence on easily measured but incomplete indicators. For example, the absence of recorded injuries does not necessarily demonstrate that an enterprise has achieved a high level of safety performance. The same result may occur because hazardous conditions are not reported or because incidents are inadequately documented.

Consequently, a more balanced assessment should include both outcome indicators and preventive performance indicators. Outcome indicators include occupational injuries, lost-time incidents, and recorded occupational illnesses. Preventive indicators include hazard identification, employee participation, training effectiveness, equipment inspections, and the completion of corrective actions.

The proposed five-component model addresses this issue by combining financial and non-financial motivation with organizational support and employee participation. Its practical advantage is that it connects employee motivation with observable preventive activities.

Nevertheless, motivational programmes cannot compensate for fundamental deficiencies in production safety. An employee cannot be expected to maintain safe behaviour if machinery is inadequately guarded, protective equipment is unavailable, or the established work schedule makes compliance practically impossible.

Therefore, motivation should operate within a properly organized occupational safety management system. Technical risk controls, safe workplace design, maintenance, adequate staffing, and employer responsibilities remain essential.

The model also requires adaptation to the organizational characteristics of individual enterprises. A large industrial facility may use departmental performance indicators and formal

incentive programmes, whereas a small enterprise may rely more heavily on direct supervisory communication and employee participation.

Further empirical research should examine how different motivational combinations influence safety compliance, hazard reporting, employee participation, and occupational injury outcomes across different production sectors.

Conclusion. Employee motivation is an important organizational factor in the implementation of occupational health and safety measures in industrial production. Its influence is expressed not only through compliance with established procedures but also through employees' willingness to identify hazards, report unsafe conditions, participate in preventive activities, and contribute to the improvement of working conditions.

The analysis shows that financial incentives alone are insufficient for developing stable safe-working behaviour. Their effectiveness depends on the fairness of the assessment criteria, the availability of appropriate working conditions, and the consistency of management decisions.

Intrinsic motivation, professional development, managerial support, employee participation, and organizational recognition should therefore be considered complementary elements of a comprehensive motivational system.

The principal methodological contribution of this study is the proposed five-component motivational model, which integrates economic, professional, managerial, participatory, and organizational mechanisms. In addition, the proposed assessment framework provides a basis for monitoring motivational effectiveness through indicators of compliance, participation, reporting, competence, corrective actions, and management commitment.

The model offers a structured approach for incorporating motivation into occupational safety management at industrial enterprises. Its further development should involve empirical testing, determination of appropriate indicator weights, and evaluation of its effectiveness under different production conditions.

Ultimately, sustainable improvements in occupational safety require more than formal instructions and periodic inspections. They depend on an organizational environment in which safe work is technically achievable, professionally understood, consistently supported by management, and recognized as a shared responsibility.

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