Journal of Advanced Multidisciplinary Studies
JAMS
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admin@jurnal-jams.or.id
https://jurnal-jams.or.id
Vol. 1, No. 2, Juli 2025 | Page. 97 - 103

IMPLEMENTATION OF THE OHS MANAGEMENT SYSTEM IN IMPROVING OPERATIONAL SAFETY OF TOLL ROAD TRANSPORTATION

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Keywords:

SMK3, Toll Road, Accident Risk, Project Management.

Abstrak

The implementation of the Occupational Health and Safety Management System (SMK3) is a key factor in improving operational safety in toll road transportation projects. This study aims to evaluate the effectiveness of SMK3 implementation and its contribution to reducing work-related accidents and enhancing project performance. The research method applied is a systematic literature review based on six studies from toll road projects in Indonesia over the past five years. The findings indicate that SMK3 implementation levels are generally classified as good to excellent, with achievement scores ranging between 85% and 98%. Key supporting factors include management commitment, regular safety training, and consistent supervision. However, several challenges remain, such as low worker awareness, limited personal protective equipment, and suboptimal risk reporting. SMK3 implementation has proven to significantly contribute to work safety, as indicated by a decrease in accident rates and increased productivity. This study concludes that consistent and sustainable SMK3 implementation is a strategic effort in establishing a safe work environment in the toll road construction sector

INTRODUCTION

Occupational safety and health is an important matter not only in companies but also in any setting, including educational institutions such as schools and universities, especially in the field of construction. This is because the impacts of workplace

accidents and occupational diseases do not only harm the employees/workers but also cause both direct and indirect losses to the organization (Wadipalapa et al., 2022)

An occupational accident is an unexpected and unintended event that causes material loss and may result in injury or death (Permatasari & Gunawan, 2024).

The development of toll road infrastructure in Indonesia has experienced significant acceleration in recent years as part of the government's efforts to enhance connectivity and national economic growth. However, along with this progress, the risk of work-related accidents in the toll road construction sector has also increased, posing serious challenges in the field of occupational safety and health (OSH). Data from BPJS Ketenagakerjaan (the Indonesian Workers Social Security Agency) indicates that the construction sector is one of the sectors with the highest rate of workplace accidents (Srisantyorini & Safitriana, 2020).

The Occupational Safety and Health Management System (OSHMS) has become a crucial element in efforts to reduce the number of workplace accidents in toll road projects. Effective implementation of OSHMS can help identify potential hazards, assess risks, and establish appropriate control measures. For example, a study by (Gian Indria, 2023) on the construction project of the Serang–Panimbang Toll Road Section 2 showed that the implementation of OSHMS had a significant impact on the project's success—amounting to 79.4%, with the achievement level of OSHMS implementation considered satisfactory at 91.109%. However, a hindering factor in the effort to prevent workplace accidents is the availability and use of Personal Protective Equipment (PPE), which therefore requires continued attention and management.

A study by Wulandari et al. (2020) on the South Cross Route Project Lot 8 Jarit–Puger found that the implementation of the Occupational Safety and Health Management System (SMK3) achieved a score of 81.13%, indicating that the implementation of SMK3 in this project was carried out very well. However, there were obstacles such as the lack of availability of personal protective equipment (PPE) and the need for increased supervision. Research by Pangestu (2022) on the Yogyakarta–Solo Toll Road construction project showed that the implementation of SMK3 obtained a score of 92.45%, which is categorized as good in the implementation of SMK3 since the score is >85%. This indicates that a well-implemented occupational safety and health management system can minimize the potential risk of work-related accidents.

An analysis by (Putra Lutfi Andriawan, 2021) on the Solo–Jogja Toll Road project shows that out of the five aspects representing the Occupational Safety and Health Management System (SMK3), an average score of 85.32% was achieved, which complies with Government Regulation Number 50 of 2012 and received an "excellent" rating. However, there is a strong need for sustained maximum implementation and maintenance of the existing standards to ensure that SMK3 becomes a key factor in reducing workplace accidents on the project.

Based on these various studies, it can be concluded that effective implementation of SMK3 contributes significantly to improving operational safety in toll road transportation. Nevertheless, challenges such as the availability of personal protective equipment (PPE), compliance with safety procedures, and fostering a strong safety culture still need to be addressed. Therefore, this study aims to comprehensively review the implementation of SMK3 in enhancing the operational safety of toll road transportation, with a focus on identifying best practices and the challenges faced during its implementation.

RESEARCH METHODE

This study employs a literature review method with a descriptive qualitative approach, aiming to identify, analyze, and synthesize various findings related to the implementation of the Occupational Health and Safety Management System (SMK3) in toll road transportation operations in Indonesia. This approach was chosen to gain a comprehensive understanding of best practices, challenges, and the impact of SMK3 implementation on workplace safety and operations within the toll road environment.

The data used in this study were sourced from accredited national scientific journals, conference proceedings, undergraduate theses/master's theses from reputable universities, as well as relevant official institutional reports published within the last five years. The data collection process was conducted through systematic searches using academic search engines such as Google Scholar, Garuda Ristekbrin, and institutional repositories. Keywords used included: "SMK3 toll roads," "toll project work safety," "toll construction risk management," and "OHS evaluation of toll road transportation." Each article found was then selected based on topic relevance and clarity of methodology.

The data were analyzed qualitatively using a content analysis approach, which involved identifying key themes, comparing findings across studies, and drawing conclusions based on emerging patterns. The analysis focused on aspects such as the level of OHSMS (Occupational Health and Safety Management System) implementation in toll road projects, supporting and inhibiting factors of implementation, the impact of OHSMS on safety and operational performance, and recommendations for system improvement and innovation.

To enhance the validity of the results, source triangulation was conducted by comparing information from various references to obtain an objective and reliable overview. This study is limited to a literature review and does not involve the collection of primary data through interviews or field observations. Therefore, the findings are theoretical syntheses and may not fully represent the specific conditions across all toll road projects in Indonesia.

RESULT AND DISCUSSION

The implementation of the Occupational Safety and Health Management System (SMK3) in toll road transportation projects is a strategic effort to prevent workplace accidents, improve labor productivity, and ensure the continuity of the construction process. In the context of large infrastructure projects such as toll roads, the high level of occupational risk demands a management system that is structured, measurable, and integrated with project operations.

SMK3 refers to Government Regulation No. 50 of 2012, which mandates that companies with ≥100 employees or a high level of potential hazards implement this management system. In the toll road construction sector, this becomes particularly crucial due to field activities involving heavy equipment, work at heights, and complex outdoor working conditions.

Based on various studies over the past five years, the implementation of SMK3 has shown a significant contribution to reducing workplace accident rates. Research by Farah et al. (2023) on the Serang–Panimbang Toll Road Section 2 project showed that evaluating the implementation of SMK3 had a direct impact on achieving project safety

targets. This is supported by the study conducted by Magfirona et al. (2022) on the Solo–Jogja Toll Road project, which stated that the system implemented according to standards was rated as "very good."

The implementation of the Occupational Health and Safety Management System (SMK3) is not merely administrative, but also involves integrative strategies such as regular training, provision of personal protective equipment (PPE), daily safety inspections, and internal OHS audits. A study by Prayoga (2021) showed that a systematic implementation of SMK3 on the Bogor Ring Road Section IIIA Toll Road project directly impacted the increase in workers' awareness and the reduction of potential accidents.

However, the implementation of SMK3 also faces challenges. A study by Hakim (2024) on the Yogyakarta–Bawen Toll Road found that out of 124 identified risks, 19 were categorized as high-risk. This indicates that even though the system is in place, continuous evaluation of the effectiveness of risk control measures is necessary.

This discussion leads to the conclusion that the success of SMK3 implementation in the toll road context does not solely depend on the completeness of documents or certifications, but also on the involvement of all project elements: management, field supervisors, and workers. This effort must be supported by a strong safety culture, ongoing training, as well as an effective reporting and evaluation system.

Based on a literature analysis of six relevant studies on toll road projects in Indonesia, the main findings can be summarized as follows:

1. **The Implementation Level of OHSMS is Excellent**
   In the Solo–Jogja Toll Road project, (Magfirona et al., 2022) reported that the implementation level of SMK3 was in the very good category with an average score of 85.32%. This evaluation indicates that the project has met the minimum standards regulated in Government Regulation No. 50 of 2012.
   Farah et al. (2023) research on the Serang–Panimbang Toll Road showed an implementation level of 91.10%, categorized as “satisfactory.” The SMK3 evaluation in the study contributed 79.4% to the project’s success.
2. **The Contribution of SMK3 to Risk Reduction**
   Hakim (2024) identified 124 potential occupational hazards in the Yogyakarta–Bawen Toll Road project. Although the majority fall into the moderate category, 19 risks are classified as high. With the implementation of SMK3, these risks are managed through engineering controls, administrative controls, and the use of personal protective equipment (PPE).
   Research by Pangestu (2022) shows that the implementation score of SMK3 at 92.45% has a significant impact on reducing workplace accidents and ensuring smooth progress in construction projects.
3. **Managerial Influence and Supervision**
   Prayoga (2021) states that the success of SMK3 implementation in the Bogor Ring Road Toll Road Section IIIA project is influenced by managerial consistency in conducting supervision, training, and evaluation of all SMK3 activities on site. This finding is also supported by the results of Srisantyorini and Safitriana (2020), who reported a compliance rate of 98.04% with SMK3 in the Jakarta–Cikampek 2 Elevated Toll project, thanks to strict supervision from the project management.

4. **Inhibiting Factors**
   Several obstacles in the implementation of SMK3 found in the study by Farah et al. (2023) include incomplete personal protective equipment (PPE), low worker compliance with SOPs, and weak incident reporting.
   Similar obstacles were also mentioned in the studies of Prayoga (2021) and Magfirona et al. (2022), namely the lack of a safety culture (K3) and rapid worker turnover, which affect the effectiveness of trainingp.

CONCLUSSION

Based on a literature review of six studies related to the implementation of the Occupational Safety and Health Management System (SMK3) in various toll road projects in Indonesia, it can be concluded that SMK3 is a very important instrument in creating a safe and productive work environment, especially in the toll road infrastructure construction sector which has high work risks. Almost all of the analyzed studies show that the level of SMK3 implementation falls within the good to very good category, with implementation scores ranging from 85% to 98%. These figures reflect that in many toll road projects, SMK3 has been systematically applied in accordance with the provisions outlined in Government Regulation No. 50 of 2012. In several cases, such as the Solo–Jogja Toll Road and the Serang–Panimbang Toll Road projects, the implementation of SMK3 not only succeeded in reducing work accident risks but also contributed significantly to the smooth execution of the projects, achievement of time targets, and cost efficiency.

The success of SMK3 implementation is influenced by several key supporting factors, such as:

1. High project management commitment in terms of policies and supervision,
2. Routine and comprehensive occupational safety training,
3. Provision of personal protective equipment (PPE) that meets standards,
4. Regular field supervision and occupational health and safety (OHS) audits,
5. Active worker participation in OHS activities such as simulations and risk reporting.

However, the implementation of SMK3 also faces challenges that cannot be ignored. The main obstacles encountered include:

1. There is still a limited availability and consistent use of personal protective equipment (PPE),
2. Low awareness and discipline among workers regarding workplace safety procedures,
3. An incident reporting system that is not yet optimal, especially in terms of transparency and speed of risk management,
4. High workforce turnover, resulting in gaps in understanding of occupational health and safety procedures.

These findings indicate that the implementation of SMK3 (Occupational Health and Safety Management System) should not merely be carried out in the form of documents or administrative compliance, but must be thoroughly integrated into the project work culture. The success of the occupational health and safety program highly depends on the active role of all parties involved—from top management to field workers.

Therefore, the implementation of SMK3 should be viewed as a continuous and dynamic process. Regular evaluation and improvement strategies are necessary to adapt

the system to real challenges in the field. In addition, a safety culture and safety leadership-based approach must become an integral part of the project management system so that safety goals are not only achieved but also become core organizational values.

Thus, it can be concluded that the consistent, strategic, and sustainable application of SMK3 is a vital element in supporting the operational safety of toll road transportation, as well as creating a healthier, safer, and more efficient working environment in the national construction sector.

SUGGESTIONS

Based on the results of the study and the conclusions presented, here are several recommendations that can be used as guidelines to improve the effectiveness of the implementation of the Occupational Health and Safety Management System (OHSMS) in toll road projects:

1. **Enhancement of Safety Culture**

   A continuous effort to build a strong safety culture in the work environment. This can be achieved through intensive communication, regular counseling, and the establishment of change agents (safety champions) at every project level.
2. **Strengthening Managerial Commitment**

   Project management needs to demonstrate a high level of commitment to the implementation of OHSMS, not only in the form of policies but also through direct involvement in field supervision, training, and safety evaluations.
3. **Enhancement of Training and Socialization of SMK3**

   Training programs must be conducted regularly with updated materials that are adapted to the dynamic risks in the field. Training should also reach all workers, including contract or daily labores.
4. **Fulfillment and Supervision of Personal Protective Equipment (PPE)**

   The availability of PPE must be ensured to be sufficient, of good quality, and meet standards. In addition, supervision of its usage needs to be strengthened so that it is not only available but also properly used by all workers.
5. **Development of an Effective Risk Reporting and Evalua**

   The incident reporting and hazard identification system must be simplified, easily accessible to workers, and equipped with prompt and transparent follow-up. Internal occupational health and safety (OHS) audits should also be conducted regularly to assess the effectiveness of risk control measures.
6. **Integration of SMK3 with Information Technology**

   The utilization of digital technology, such as risk reporting applications, IoT-based monitoring systems, or real-time data-based safety evaluation dashboards, can be a solution to improve the efficiency and accuracy of SMK3 implementation.
7. **Continuous and Adaptive Improvement**

   Every project has unique risk characteristics. Therefore, the evaluation of the OHS (Occupational Health and Safety Management System) must be dynamic and adaptive, with a continuous improvement approach based on feedback from the field.

   These recommendations are expected to serve as a foundation for stakeholders in the construction sector, especially in toll road development projects, to enhance the overall and sustainable quality of OHS implementation.

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