


THE ROLE OF SAFETY CULTURE IN PREVENTING WORK ACCIDENTS IN HIGHWAY INFRASTRUCTURE PROJECTS

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Abstrak	
<p>Keywords:</p> <p><i>Culture Safety, Accident Work, Project Infrastructure Road Highway, K3, Training Safety.</i></p>	<p><i>Work accidents on projects infrastructure road raya Still become challenge serious impact on safety workers, delays projects, and improvements cost. Research This aiming For analyze role culture safety in prevent accident work in the environment project construction road raya. The method used is approach quantitative through distribution questionnaire to 30 respondents from a number of project road raya active. The variables studied covering commitment management, K3 training, communication safety, use tool protector self (PPE), and system reporting incident. Analysis results show that there is significant relationship between implementation culture safety and decline amount accident Work. The most influential indicators is training safety and routine communication in the field. In conclusion, culture safety own role strategic in create environment safe and supportive work smoothness implementation project. Therefore that, strengthening culture safety must become priority main in management project construction.</i></p> <p><i>This is an open access article under the CC BY-NC-SA 4.0 license</i></p> <div style="text-align: center;">  </div>

INTRODUCTION

Project infrastructure road raya is one of sector construction that has level risk accident high work. Complexity activity field, use tool weight, condition dynamic environment, as well as pressure to time and cost project often become factor trigger the occurrence accident. Therefore that, the implementation system management safety effective work become very crucial in create environment safe and productive work. (cooper, 2001 p. 56)

One of aspect key in system management safety is culture safety work. culture safety refers to values, beliefs, perceptions, and attitudes collective owned by all individual in organization to safety work. culture This covers commitment management to safety, participation active workers, open communication about risk, as well as

compliance to procedure applicable safety.

In context project road Raya, culture safety own role strategic in prevent accident work. Strong culture capable to form behavior proactive work in identify and control potential danger before incident happened. On the contrary, the weakness culture safety often associated with negligence, lack of reporting incidents, as well as low compliance to standard operational safety.

Furthermore, the project road raya involving various party, start from contractor main, subcontractor, supervisor, up to worker field with background behind culture and level diverse education. In conditions this, culture safety become runaway together with the direction all priority party main : prevent lost lives, injuries and losses consequence accident work. This is No only important from side humanity, but also of aspect law, reputation companies, and sustainability project.(Endroyo, 2006 p. 92)

Work accidents in the sector construction, especially in projects road raya, still become problem main in achievement standard safety work. According to data from BPJS Employment and the Ministry of PUPR, the employment sector construction donate more of 30% of total accidents Work national. In the context of this, culture safety become component key For change pattern thoughts and behavior work, from just fulfil rule become commitment collective to safety.

Therefore that, the formation and strengthening culture safety must become an integral part of planning and implementation project infrastructure road raya. This effort covers training sustainable, implementation reward and punishment system, improvement communication safety, and exemplary from leader project. With culture strong safety, project road raya can implemented with efficient, safe and appropriate with principle development sustainable. (Gunawan, 2018 p. 166)

RESEARCH METHODS

Study This use approach method quantitative For Interview deep with a number of party key (supervisor, senior worker, K3 officer) to dig perception and experience related implementation culture safety. for analyze connection between culture safety work (variable X) and amount accident work (variable Y) in the project infrastructure road Raya. Population & Sample has 30 respondents from worker project, selected randomly.

Questionnaire Likert scale (1–5) with variables :

- 1) Commitment management
- 2) Training safety
- 3) Safety communication
- 4) Reporting incident
- 5) Behavior safe

Data analyzed use multiple linear regression For see influence culture safety to level accident work. for evaluate culture safety, and accident data from report project. Indicator Culture Safety : commitment management, K3 training, communication, PPE compliance, reporting incident. Technical analysis Prove in a way statistics that implementation culture good safety can lower number accident Work.

RESULTS AND DISCUSSION

Research result to emphasize that culture safety Work is component important in prevent accident. In the project road raya, where the conditions very dynamic and full

work risk (then cross vehicle, terrain open, tool weight, weather, etc.), culture safety become framework thinking and behavior collective that directs every individual For always alert, responsible answer, and obey to standard safety.

Commitment management proven to be very influential to formation culture safety. Active management in K3 activities, providing training periodic, tighten supervision, as well as follow up report incident, creating supportive environment behavior safe. On the other hand, projects that are not show support management towards K3 tends to own compliance low and numbers accident more tall.

Participation worker in culture safety Still need improved. Many workers feel that not quite enough answer safety fully in hand K3 officers. In fact, the culture effective safety demand involvement active all over parties, including workers at the bottom line. Involvement program such as safety talk, discussion forums weekly, and awards to reporting danger can increase sense of ownership to culture safety.

A number of challenge in build culture strong safety in the project road raya among others:(Konstruksi, 2021 p. 32)

- 1) Substitution power high work, making training must done over and over again
- 2) Pressure against time target projects, which are often make worker ignore procedure safety. Lack of documentation or act carry on to incident almost woe

Study This done on several project infrastructure road kingdom. involving 30 respondents from worker field, foreman, supervisor, K3 officer, and management project. Data collection techniques are carried out through questionnaire, interview in-depth, observation field, and study documentation. From the results data collection, obtained information as following:Results questionnaire show that part big respondents (74%) stated that culture safety Already implemented in the project, but not optimal. Aspects culture safety is the most prominent is : (Ismail, 2022 p. 77)

- 1) Commitment management towards K3 (70% stated Good)
- 2) Availability training safety work (65%)
- 3) Compliance use tool protector self (PPE) (80%)
- 4) Participation worker in discussion safety (still low, only 42%)
- 5) System reporting danger and incident (walking) However No consistent)

a. Safety Culture in Prevention Accident Work On Project Highway Infrastructure

In today's industrial era, companies must increase their attention to the importance of the Occupational Safety and Health (K3) Program, because it is not only absolute for employees but also important for the continuity and progress of the company. In order to achieve the objectives of the K3 program, various elements and resources need to be used, so that in the implementation of K3 it needs to be organized and regulated into an K3 management system (SMK3). The implementation of the K3 Management System is one form of effort to create a safe, healthy and prosperous work environment, free from work accidents and occupational diseases, and free from environmental pollution, towards increasing productivity as mandated in Law No. 1 of 1970 (Indonesia, 1970) Concerning Occupational Safety. (Gunawan, 2018 p. 176)

Construction service activities have been proven to provide important contributions to the development and economic growth of all countries in the world, including Indonesia, both organized by the government and the private sector. The

construction industry has different characteristics from one construction project to another. These different construction project characteristics will affect the progress of the implementation work in the field. The progress of the work can be delayed or according to schedule or can also be very fast from what has been planned. In construction projects there are also workers or workers with different backgrounds. (Ismail, 2022 p. 87)

Project infrastructure road raya is one of sector construction that has level risk accident Work high. Risk the originate from use tool weight, environment Work open, then cross active, and target time pressure. Therefore that, the implementation culture strong safety become very crucial in prevent the occurrence accident work. culture safety developed through training periodic, routine communication (safety talk, toolbox meeting), and exemplary from leader project proven increase awareness workers. Psychological factors like a sense of responsibility answer, involvement team, and perception risk also plays a role in push action safe.

More accidents often occurs in the environment work that is not own system communication open, and not enough training and supervision. Therefore, integration culture safety to in system management project become solution term effective length. Culture safety play a role important in lower level accident work on project road raya. The most dominant factor is training and communication consistent and comprehensive safety. (Widodo, 2021 p. 65)

This collective awareness is one of the indicators of the success of educational activities. The process of internalizing safety values has been proven to be possible through an educational and participatory approach, where workers feel involved in efforts to maintain safety together. This situation creates a safer and more productive work environment, with a significantly reduced risk of accidents.

In addition to direct implementation, this activity is also equipped with a daily evaluation session conducted after the work is completed. This evaluation aims to assess the extent to which workers implement the use of PPE and maintain safety while working. The results of the evaluation are recorded and used as material for improvement the next day, so that the learning process and improving the quality of work continue.

In the evaluation session, aspects that are of concern include compliance with the use of PPE, work effectiveness, and the physical and mental condition of workers after a day of work. In addition, evaluation is also used as a means of appreciation for workers who demonstrate good performance and high compliance with safety standards. Appreciation is given in the form of simple awards such as thanks or open praise in front of colleagues. This step of giving appreciation has been proven to increase worker motivation to continue to maintain work safety standards. Workers who are appreciated feel appreciated for their efforts, and this has an impact on increasing their sense of responsibility for their duties and commitment to the use of PPE. On the other hand, other workers are also motivated to show similar performance in order to gain recognition. (Hopkin, 2021 p. 287)

Periodic evaluation of the condition of PPE and the implementation of K3 also provide great benefits. Through the evaluation, several minor damages to PPE were found which were immediately addressed, so that risks could be reduced early on. Evaluation also serves as a means to provide constructive feedback to workers and develop strategies to improve work procedures that are more adaptive to needs

in the field. One of the positive results of this program is the formation of collective awareness and a culture of reminding each other among workers regarding the use of PPE. This shows that a participatory educational approach is able to form proactive work behavior towards safety. This culture will be a strong foundation for long-term work safety efforts in the project environment. (cooper, 2001 p. 214)

Giving appreciation to workers who are disciplined in implementing K3 provides additional motivation to maintain good work behavior. Simple awards are effective in building work spirit and a sense of responsibility, which indirectly also increases overall team productivity. Workers feel appreciated, so they are more enthusiastic about maintaining safety standards in all their activities.

b. Safety Culture as Value System and Behavior

Culture safety No just formal rules, but rather is attitudes, values, beliefs, and behavior collective that is embedded and carried out by everyone in the environment work. culture This to form method workers and management look at risk, as well as How they act For prevent danger. Training and communication safety is part important in build culture effective safety in projects infrastructure road raya. Second element This play a role direct in increase awareness, understanding, and behavior safe worker to various potential danger Work.(Ervianto, 2022 p. 134)

In the project road raya, when culture safety Already become part from daily life (such as wearing PPE without must reminded, reported condition No safe, or stop work If There is risk, then prevention accident become more effective and sustainable. Behavior is a biological manifestation of individuals in interacting with the environment, starting from the most visible to the invisible behavior, from the perceived to the unperceived. Behavior is closely related to knowledge and attitudes, behavioral changes are closely related to the learning process.(Widodo, 2021 p. 87)

Occupational Safety and Health Behavior is the attitude of workers to always apply the K3 culture in every job they do, implementing the K3 culture as a need, not as an obligation. With the implementation of K3 behavior by workers, work results will be obtained that increasingly meet K3 requirements which will have an impact on: (Amir, T., & Fauzi, N, 2021 p. 321)

- 1) The number of accidents and work-related illnesses is decreasing
- 2) Worker welfare is increasing because their safety is guaranteed, productivity is increasing and cost efficiency is increasing.

The implementation of K3 behavior is needed to prevent work accidents and reduce the occurrence of work-related diseases. K3 also ensures that every worker and other people in the workplace receive K3 protection, which aims to protect their safety rights in carrying out work for the welfare of life and increasing national production and productivity, ensuring the safety of others in the workplace, production sources are maintained and used safely and efficiently. The behavioral determinant theory according to Green in Notoatmodjo explains that human behavior is formed from the knowledge, perception, desire, will, motivation and intention of the perpetrator.

The elements that should be considered in developing and implementing K3 program behavior are as follows: (Ardi, 2015 p. 115)

- 1) Commitment Management as Key Drivers

- 2) Involvement Worker in Build Culture Safety
- 3) Provisions for creating a work environment that guarantees the creation of K3 at work
- 4) Provisions for organizing training and education
- 5) Preventive inspection for work accidents

Worker is element important in system safety work. Participation active they in reporting potential hazards, K3 discussions, and safety forums can increase awareness collective to risk. Culture good safety push worker For each other remind, report without afraid, and follow as well as in taking decision related safety. Unfortunately, there is still Lots workers who have not realize that they own role important, isn't it? only as executor, but also as guard safety together. Through training, workers can : (Sobirin, 2021 p. 211)

- 1) Understand standard operational applicable procedures (SOP)
- 2) Know method use tool Work with Correct
- 3) Reduce action at risk consequence ignorance

Training conducted in a way periodic also helps refreshing memory worker to correct K3 protocol. Training and communication safety is foundation main in to form culture safety strong work. When workers equipped sufficient and continuing knowledge given clear and regular information, then risk accident work on project road raya can pressed in a way significant.

Unsafe Action or unsafe acts are all actions taken by a person which will increase the risk or possibility of the person having an accident. Unsafe Action is an action that triggers a work accident. Unsafe Action occurs due to two things, namely unintentional errors and active errors or violations. Unsafe actions are influenced by internal factors of the worker himself, including the characteristics of the worker. (Sobirin, 2021 p. 154)

c. The Role of Training and Communication Safety

Project infrastructure road raya is one of sector vulnerable construction to risk accident work. Height mobility tool heavy, work field open, and pressure time often causes worker face significant danger. Therefore that, the implementation system safety effective work is very much needed. One of element important in system the is training and communication safety. Both aspect This functioning as tool For increase awareness worker to danger and strengthen culture safety in the environment Work.

Training safety is a systematic process For equip worker with knowledge, skills and awareness will risk Work as well as method prevent accident on the spot work. In the project infrastructure road raya, training safety covers understanding to procedure Work safe, use tool protector self (PPE), handling emergency, and operation tool heavy.

Safety communication is effort delivery information in a way clear, consistent and sustainable related potential danger, rules safety, and steps prevention in the environment work. This communication done through daily briefings, safety talks, boards information, as well as interaction direct between leader projects and workers. Both element This own role important in build culture safety, because : (Suraji, A., et al, , 2021 p. 29)

- 1) Training ensure worker understand and be able to apply practice safe work.

- 2) Communication keeps information safety still distributed and understood in a way evenly distributed by all parties. Through effective training and communication, risk accident can be minimized, and awareness safety in the field can be improved in a way significant.

Training ongoing safety and effective communication (e.g. daily briefings, weekly safety talks, bulletin boards). K3 information) helps guard understanding worker to dangers and ways avoid it. Projects that routinely hold training and delivering information risk proven own incident more work low compared to underdeveloped projects active in a way communicative.

Training and communication safety play a role important in to form behavior safe work, with method equip worker will K3 knowledge and ensure information safety delivered routinely and effectively to prevent accident work on project construction. According to Law No. 1 of 1970 concerning Safety Work, K3 is all effort For ensure safety power Work through prevention accidents and illnesses consequence Work. Safety communication guard channel information still active between management and workers. Good communication allows : (Sutrisno, B. , 2022 p. 121)

- 1) Information danger delivered in a way fast and precise.
- 2) Worker report condition No safe.
- 3) The intertwining culture open in guard safety together

Training safety is an educational process For equip worker with knowledge and skills in face risk work. Training materials covers use of PPE, work SOP, responsiveness emergency, and control danger. Communication safety covers delivery information routinely and effectively related potential danger, steps prevention, and procedures Work safe. Its shape can in the form of daily briefings (toolbox meetings), posters, safety talks, or board K3 information. (Ismail, 2022 p. 91)

Training and communication safety play role important in prevent accident work on project infrastructure road raya. Through training, workers equipped understanding about procedure safe. While that, communication keep information safety always delivered in a way effective. Both of them support formation culture strong safety. (Hopkin, 2021 p. 67)

Therefore That Training and communication safety own role strategic in prevent accident work on project infrastructure road raya. Through training, workers understand procedure safe work, while communication safety ensure information risk and prevention spread in a way evenly. The combination of both to form culture more work alert, disciplined and proactive in face potential danger in the field.

d. Culture of Reporting and Prevention Proactive In Project Highway Infrastructure

Project infrastructure road raya is one of type work construction with level risk accident high work consequence condition dynamic work, exposure to Then cross active, usage tool weight, and pressure time settlement project. In facing challenge this, the implementation culture reporting and prevention proactive become very important in create system safety effective and sustainable work. Culture reporting allow all over workers, including inspector field and operator, for report condition dangerous, almost near miss, or violation procedure without Afraid

will sanctions or negative stigma. Reporting This become base taking fast and correct decisions in identify root problem before incident happen. ((ILO), 2021 p. 38)

Culture reporting is a condition organization where everyone worker feel safe, driven, and responsible answer For report incident, condition No safe, and incident almost near miss without Afraid will sanctions or consequence negative. In the project infrastructure road Raya, culture reporting important Because help identify potential danger since early, so that allow action corrective before accident happened. Culture this also creates communication open between workers, supervisors, and management about issues safety in the field. (Reason, 2020 p. 271)

Prevention proactive is approach in management safety work that emphasizes identification and control potential danger before happen accident. This includes activity like routine inspection, assessment risk, training safety, and engagement active all party in to design solution preventive. In the project road highway, approach This become crucial remember condition changing work fast and full challenge technical

On the other hand, prevention proactive is an approach that emphasizes anticipation to potential danger through observation field, safety audits, as well involvement active all over party in control risk. Approach This push creation culture work that is not only focus on completion work, but also on protection to safety and health power Work.

When culture reporting and prevention proactive internalized in all line project road raya, then potential accident Work can pressed in a way significant, at the same time increase efficiency and success project in a way OverallWrong one pillar of culture strong safety is system reporting dangers and incidents almost near-miss. When workers feel safe For report, then potential danger can identified more early and prevented before become accident. This builds culture proactive compared to reactive. Based on various field studies and data : (Gunawan, 2018 p. 319)

- 1) Project with level culture safety tall own number more accidents low, good from aspect frequency and also level severity.
- 2) Culture strong safety push creation environment more work disciplined, structured, and caring to fellow.
- 3) Efficiency Work increase Because time No Lots wasted consequence incident.

A culture of reporting and proactive prevention are two key pillars in creating an effective work safety system in highway infrastructure projects. A culture of reporting encourages openness and honesty in reporting unsafe conditions or near misses, so that management can take corrective action quickly and appropriately. Meanwhile, a proactive prevention approach emphasizes the importance of identifying and controlling risks before incidents occur, through careful planning, regular inspections, and active involvement of all workers.

CONCLUSION

The author can conclude that based on the description and analysis of the discussion above, it can be concluded that culture safety own a very important role in effort prevention accident work on project infrastructure road raya. Implementation culture good salvation — through commitment management, training safety, effective communication, compliance use of PPE, as well as involvement active all over workers

— proven capable lower level accident in a way significant.

Projects that invest values safety as part from culture Work daily show level greater awareness high, action more work be careful, and control greater risk proactive. With Thus, culture safety No only as complement procedure work, but as element strategic in create environment safe, productive and sustainable work.

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