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IMPROVEMENT PROPOSAL FOR OPERATIONAL SAFETY IN PT KERETA API INDONESIA (PERSERO) USING PEOPLE MANAGEMENT APPROACH

Irdra Firstyadhika and Yuni Ros Bangun
School of Business and Management
Institut Teknologi Bandung, Indonesia
irdra.first@sbm-itb.ac.id

Abstract? *Health and Safety at work is a thought and effort to ensure the integrity and perfection of both physical and spiritual labor in particular, and human beings in general, and cultural work towards fair and prosperous society (Mangkunegara, 2002). Another source said that safety is a series of efforts to create a work atmosphere that is safe and peaceful for those employees who worked at the company in question (Suma'mur, 2001). KNKT (National Committee on Transportation Accidents of Indonesia) in the event of the national railway safety held on March 2011, concluded: Safety is impossible without leadership, without safety leadership is impossible. Enforcement of laws and regulations that are less consistent or incomplete rules on safety, inadequate training, lack of rewards and punishments, regulations that need to be replaced or adjusted, transportation infrastructure that does not comply with the demands, means of transportation that do not meet the airworthiness standards and technical requirements, and lacking even the lack of coordination may be the underlying cause of the accident. The model of this research discusses that good people management companies have a positive impact to the operational safety performance. Good people management is influenced by a company's management commitment, safety committee involvement, leadership, training and development, communication and control, and performance management. While operational safety performance was favorably impacted by a solid safety culture, company reputation, preventive action, and the low incident. The results of the research showed that the predictors of good human management company with safety performance has a strong influence; then communication and control, performance management, and the involvement of the safety committee are the variables that were highly influential. Gap analysis using descriptive analysis*

found that there are several indicators that have a low value in the eye of employees.

Keyword? *safety, accidents, people management, state owned company, transformation, Indonesian state owned company*

I. INTRODUCTION

In 2009 Indonesia Railways Corporation, PT Kereta Api Indonesia (PT KAI) gets a new CEO named Ignatius Jonan, who was appointed Minister of state at the time, Mr. Djalil to signify the transformation era of PT KAI for Indonesia's economic challenges in the future that is growing quickly.

One result of the transformation is the formation of a new directorate called the Directorate of Safety and Security (Directorate 5/D5) in 2011. The establishment of the directorate 5 is one step to business challenges that must be faced by PT KAI is how to deal with the threat of a foreign private rail or other modes of transportation in the future which in fact has a better safety performance, how to respond to the economic development of Indonesia are likely to be impartial the railway transportation, and how to reduce the number of accidents by making the right policy which are well targeted and effective in improving the performance and quality of operational safety PT KAI in the future.

Literature

A. Domino Effect Theory
According to Heinrich (1932), an "accident" is one factor in a sequence that may lead to an injury. The factors can be visualized as a series of dominoes standing on edge; when one falls,

the linkage required for a chain reaction is completed.

1. The Domino Theory Process

1. A personal injury (the final domino) occurs only as a result of an accident.
2. An accident occurs only as a result of a personal or mechanical hazard.
3. Personal and mechanical hazards exist only through the fault of careless persons or poorly designed or improperly maintained equipment.
4. Faults of persons are inherited or acquired as a result of their social environment or acquired by ancestry.
5. The environment is where and how a person was raised and educated.

2. Corrective Action Sequence (The three "E"s)

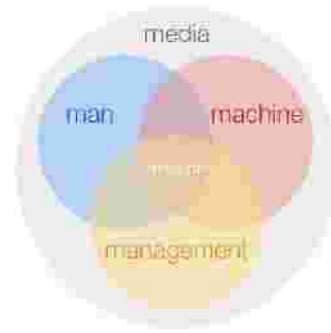
1. Engineering
 - Control hazards through product design or process change
2. Education
 - Train workers regarding all facets of safety
 - Impose on management that attention to safety pays off
3. Enforcement
 - Insure that internal and external rules, regulations, and standard operating procedures are followed by workers as well as management.

3. Human Factors Theory

Heinrich posed his model in terms of a single domino leading to an accident. The premise here is that human errors cause accidents. These errors are categorized broadly as:

- Overload
 - The work task is beyond the capability of the worker
 1. Includes physical and psychological factors
 2. Influenced by environmental factors, internal factors, and situational factors
- Inappropriate Worker Response
 - To hazards and safety measures (worker's fault)
 - To incompatible work station (management, environment faults)
- Inappropriate Activities
 - Lack of training and misjudgment of risk

B. 5M Model of Safety System



1. Equipment or Machine. The types of equipment that an injured employee was working with, its production and maintenance requirements, its layout in the work area, and its hazards and the methods of controlling them could all be clues in the investigation—for example, guarding, noise reduction, or controls of hazardous material.
2. Environment or Media. Environmental aspects may include noise; lighting; housekeeping; work inside versus outside; fumes or vapors; exhaust systems; production pressures; or stress created by the job, such as manual work versus office work, night work versus day work, weekend work, or long work days (12 hours).
3. People or Man. We must explore the physical task demands of the job, such as lifting, bending, twisting; the level of training and skill of the employee; and his or her current emotional state.
4. Management. When we investigate an incident, the purpose is to identify the root cause of the incident as it relates to as many of the key elements as possible. We are looking at the adequacy and effectiveness of the management system.

(5M model of safety engineering. FAA Safety Handbook, Chapter 15, "Principles of System Safety," Figure 5-4, p. 15-11. December 30, 2000, public domain.)

98% of incidents occurring in the workplace are due to unsafe acts or because the behavior of employees (Roughton & Mercurio, 2002). This is also supported by the facts found Frank E. Bird and George L. Germain (1996) which showed that the incident which occurred not just happen but because of events in which a failure of management to control.

II. CONCEPTUAL FRAMEWORK AND METHODOLOGY

A. Model Hypothesis

Based on literature, framework of this research were develop by the model hypothesis as seen in below.

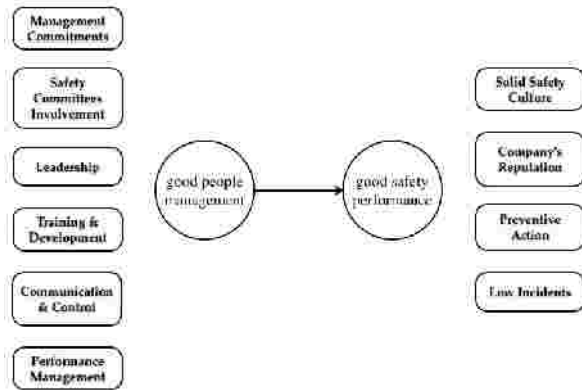


Fig. 1 Framework of model hypothesis

B. Methodology

Respondent

Research were held in Indonesian state-owned railway company, PT Kereta Api Indonesia (persero) (PT KAI). The research conducted in only 2 of 11 area of operations. This 2 area of operations can be the representative of all area of operations based on the discussion with VP Safety and Health and managers of Directorate 5 of PT KAI.

Because the research is limited in operational safety area, the respondents are the the employees who are categorized as “safety workers” in operational division such as, machinist/train driver, PPKA/Traffic Controller, PPA/In station or controller, Juru Langsir/Train connection controller, and Kondektur/Boarding controller.

Gathering Data and Information

This research used qualitative and quantitative method. A qualitative approach were done by doing semi structure interview with safety managers, and VPs. A quantitative method were done by survey to operational “safety workers” employees from 2 area of operations. The Questionnaire consists of 53 questions based on 2 variables constructed.

Partial Least Square (PLS) as Statistical Method / Predictor Analysis

Based on Joe F. Hair, Christian M. ringle, and Marko Sarstedt (2011) statement that there are some rule of thumb in choosing statistical method. Here some of are the rules:

- PLS can be used when the research is exploratory and can predicting the key target of the constructs.
- PLS supports a complex structural model which has many constructs and many indicators
- PLS can be work in small sizes respondent
- Use PLS if the research need to use latent variable scores in subssquent analysis

Descriptive Analysis Method

Descriptive method by finding the mean in every indicators in each sub-variables of X or Y which reflects the performance of every indicators in each employees mind.

Matrix of Importance

Outcome predictors and gap analysis above can be put together into a matrix of indicators to infer where the variable X should be a top priority and final priority for PT KAI for improved implementation.

Matrix has four quadrants with two dimensions. The horizontal line shows the descriptive analysis (gap analysis) and the vertical line shows the analysis of predictors.

II. CONCEPTUAL FRAMEWORK AND METHODOLOGY

A. Model Hypothesis

The statistical process succesfully identify the relation model as seen as in figure 2 at the previous page.

Here are the description of all variable symbols in the figure above

X: Good People Managemnt

X1: Management Commitments

X1.1: Vision & Mission

X1.2: Policy

X2: Safety Committees Involvement

X2.1: Safety division positioning in organization

X2.2: External References

X2.3: Worksite Analysis

X3: Leadership

X3.1: Commitment

X3.2: Skills

X3.3: Supervisory

X4: Training and Development

X4.1: Activities

X4.2: Assessment

- X4.3: Evaluation
- X5: Communication & Control
 - X5.1: Shared vision
 - X5.2: Reporting
 - X5.3: Documentation/ Safety
- Information system
 - X5.4: Feedback Channel
 - X5.5: Inspection
- X6: Performance Management
 - X6.1: Performance Management System
 - X6.2: Recognition
- Y: Good Safety Performance
 - Y1: Solid Self Safety Culture
 - Y1.1: High Awareness
 - Y1.2: Values & Norms
 - Y1.3: Behavior
 - Y1.4: Learned
 - Y1.5: Security
 - Y1.6: Involvement
 - Y1.7: Motivation
 - Y1.8: Knowledge
 - Y1.9: Leadership
 - Y2: Company's Reputation
 - Y2.1: As safest company
 - Y2.2: Safer than other transportation
 - Y2.3: Security
 - Y3: Preventive Action
 - Y3.1: Emergency Readines
 - Y3.2: Hazard Identification
 - Y3.3: Incident Analysis
 - Y4: Low incidents
 - Y4.1: Incident Level

direct relationship direction. The better a free variable, it will be followed by the increase in the dependent variable. Negative sign (-) indicates the opposite direction of the relationship. This means that if an increase in the independent variable, there will be a decrease in the dependent variable.

Based on the table above it can be seen that the value of t statistics are for 7.831. Using the 95% confidence level obtained value is equal to 1.96 t table. because the value of t statistic is higher than t table it can be concluded that the (X) has a positive influence on Good Safety Performance (Y).

From the research results it can be concluded that the most decisive performance in the Variable X is Communications and Controls (X5) = 0.894, Performance Management (X6) = 0.834, Safety Division Involvement (X2) = 0.750, Training and Development (X4) = 0.705, Leadership (X2) = 0.689, and the last one is Management Commitment (X1) = 0.635.

Likewise, it can be concluded that the most decisive variable Y is the performance order is Solid Safety Culture (Y1) = 0.806, Company's Reputation (Y2) = 0.729, Preventive Action (Y3) = 0.567, Low Incidents (Y4) = 0.533.

B. Descriptive Analysis

Gap analysis will look at where the indicator variable X the part to be improved performance in the implementation of the operational safety of PT KAI. The number that is showed at the "Gap" column are calculated from mean of all 100 respondents answers, and shows how far the current implementation compared to the target which is 1. The bigger value means worse. So by improving the performance has not been good on the indicators in the variable X, will improve the safety performance of PT KAI forward significantly. For simplicity of this descriptive analysis, the outcome classification can be divided into 2, namely:

- Range of Tolerance = 1 - 2

The range of tolerance is made on the basis that PT KAI still have the minimum target of "PLH" (Peristiwa Luarbiasa Hebat/Exceptional Great Events) and "PL" (Peristiwa Luarbiasa/Extraordinary Events). It continues to decline from year to year. In 10 years, PT KAI must have "zero accident" target which means all indicators have reached 1.

- Need Attention = 2.01 - 4

	Origin al Sample Estimate	Mean of Subsamples	Standar Deviations	T-Statistics
X -> Y	563	0.63	72	7.831

The table above illustrates the relationship of causality between Good People Management (X) on Good Safety Performance (Y). The relationship between the exogenous variable on the endogenous variable is straightforward. No relationship is indirect.

Magnitude of association between variables is indicated by the coefficient. The higher the value of the coefficient indicates greater association between these variables. Sign of relationships has a meaning to the direction of the relationship, a positive sign (+) indicates a

As in the above range of tolerance, PT KAI continues to suppress the number of operational accidents. Therefore, PT KAI must keep within the limits of tolerance, and in the long term should be to achieve "zero accident" which means all the indicators have reached 1. If not within tolerance, it means special attention.

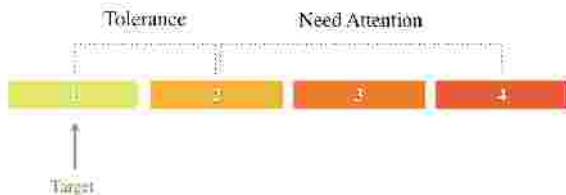


Fig. 2 Range of descriptive analysis classification

This gap analysis using descriptive analysis. Descriptive analysis is derived from the predictor variable analysis has shown what influence the operational safety performance at PT KAI, the X5: Communication & Controls, X6: Performance Management, and X2: Safety Committees Involvement.

X5: Communications & Controls			
Indicator	Q		Gap
Shared vision	Q42	Direct supervisor frequent discussions / talks about safety with subordinates	2.03
	Q3	PT KAI has been disseminating safety objectives to all employees	1.84
	Q38	My direct supervisor regularly to discuss safety goals with employee	2.14
Reporting	Q22	In case of accidents, all employees understand the reporting lines	2.6
Documentation/ Safety Information system	Q23	Safe working instructions easily available to employees	2.41

Feedback Channel	Q35	Safety regulations are reviewed regularly with employees	2.16
	Q43	Every employee has the opportunity to provide input to the development of workplace safety rules	1.88
	Q34	Employees constantly report on the state of potential accidents	1.86
Inspection	Q25	Safety inspections scheduled on a regular basis	2.6

At the Communications & Controls, all of the performance indicators that need to be improved, namely, Shared vision, reporting, Documentation / Safety Information system, feedback channel, and Inspection.

X6: Performance Management			
Indicator	Q		Gap
Performance Management System	Q24	The performance related to safety constantly judged by my immediate boss	2.27
	Q5	The punishment for employees who do not follow safety standards have been set by firm	2.13
	Q44	In here there are acknowledged / punishment for employees who rated as good / remiss in implementing safety	2.13
	Q6	KA operational safety is one indicator of job performance (KPIs)	1.84
Recognition	Q26	Safety-conscious work attitude appreciated / valued by the company	2.26

	Q7	PT KAI has a criteria / rules to respect / appreciate employees who comply with safety rules	2.14
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Also with the X6, all of the performance indicators that need to be improved. This means that some employees do not feel appreciated, and there are no criteria as far as they know so far in implementing the operational safety of PT KAI.

In the field of people management, respect for employees is a must. The numbers above results indicate that PT KAI yet equally appreciate employees who have implemented safety either.

X2: Safety Committees Involvement			
Indicator	Q		Gap
Safety division positioning in organization	Q37	PT KAI has a directorate / division specific safety	1.54
External references	Q2	To develop the safety ability of employee, PT KAI regularly sends employees to parties outside the firm / company invites external parties to follow / implement workshops, counseling, training, etc.	1.98
Worksite Analysis	Q39	PT KAI has a special program to investigate the potential hazards / accidents in the workplace	2.1
	Q52	/Special programs to examine the potential hazards / accidents is held regularly	2.06

For sub-variable X5, the indicators that have largest value (bad) is worksite analysis. This shows that there are still employees who feel that PT KAI does not have a good analysis of

the potential hazards, routine, and support the safety of their operational activities.

X4: Training and Development			
Indicator	Q		Gap
Activities	Q20	I received adequate safety training related to my work	2.04
Assessment	Q21	PT KAI are testing to assess the knowledge and skills of employees in occupational safety	2,22
Evaluation	Q45	PT KAI has tests to examine / evaluate the results of safety training to employees	2,09

All indicators in the sub-variable X4 is in the category of "Need Attention". Sub-variable is one of the weaknesses of PT KAI in implementing operational safety in particular areas.

X3: Leadership			
Indicator	Q		Gap
Commitment	Q37	My direct supervisor showed strong interest in implementing a safe railway operations	1,54
	Q2	My direct boss strongly supports safety program at PT KAI	1,98
Skills	Q39	My direct supervisor has a good knowledge about safety	2,1
Supervisory	Q52	In order to discuss safety, there is always a regular meeting with direct supervisor	2,06

2 of 3 indicators in the sub-variable X3 is in the category of "Need Attention", the skills, and supervisory.

X1: Management Commitments			
Indicator	Q		Gap
	Vision & Mission	Q 1	
Q 36		PT KAI attempt to promote safety	1,48
Policy	Q 17	PT KAI has rules and SOPs (standard operating procedures) concerning safety	1,81

This is the only sub-variable X1 that all indicators are in the tolerance range.

C. Matrix of Importance

Outcome from predictors and gap analysis above can be put together into a matrix of indicators to infer where the variable X should be a top priority and final priority for PT KAI for improved implementation. The Matrix has four quadrants with two dimensions. The horizontal line shows the descriptive analysis (gap analysis) and the vertical line shows the analysis of predictors.

Quadrant "Urgent" is the quadrant where the indicator variable X is considered to be very influential on the results of the application of safety performance, variable Y, also have yet to be fixed in accordance with the reality experienced by operational employees of PT KAI because the calculation of the mean is still above 2.

Quadrant "Watch" is the quadrant where considered very influential on the result of

applying safety in variable Y, but has a relatively better performance than the "Urgent". Therefore, PT KAI should continue to monitor the activities of the indicators included in the quadrant in order not to get into quadrants "Urgent". "Necessary" is still needs to be improved, but if PT KAI too focused fixing this, the effect is not very significant compared to quadrant "Urgent".

The most deposited is quadrant "Maintain". This quadrant is the quadrant that actually has a relatively good performance, but if PT KAI too much focus is developing indicators, the effect is not significant. In contrast to "watch", a more resilient to the effects of the application of safety, if the indicator in the quadrant "Maintain" is shifted to quadrant "Necessary" is actually relatively harmless. So it can be concluded that each quadrant must have its own way of handling different to shift indicators in the quadrant "Urgent" to "watch" and "Necessary" to "Maintain". Therefore the indicators used must be mapped in order PT KAI to create the appropriate action.

Here are the results of grouping indicators for variable X.

WATCH	URGENT
<p>Communication & Control (X5)</p> <ul style="list-style-type: none"> • Shared Vision: Declaration • Feedback Channel: Some opportunity to develop safety policy; employees report on the state of potential accidents <p>Performance Management (X6)</p> <ul style="list-style-type: none"> • Performance Management System: Safety as KPI <p>Safety Committee Involvement (X2)</p> <ul style="list-style-type: none"> • Special Division: Safety division existence • External Reference: Regularly invite external institution help PT KAI to improve safety 	<p>Communication & Control (X5)</p> <ul style="list-style-type: none"> • Shared Vision: Direct leader discuss about safety with subordinates/employees • Reporting: Accident reporting procedure • Documentation / Information System: Accessibility of safe work procedure • Feedback Channel: 2 way policy and feedback review • Inspection: Regular inspection schedule <p>Performance Management (X6)</p> <ul style="list-style-type: none"> • Performance Management System: Assessment from direct leader, reward and punishment, and punishment assessment • Recognition: Reward criteria, and company's recognition <p>Safety Committee Involvement (X2)</p> <ul style="list-style-type: none"> • Worksite Analysis: Special and routine accident potential analysis

MAINTAIN	NECESSARY
<p>Leadership (X3)</p> <ul style="list-style-type: none"> • Commitment Interest and Support 	<p>Training and Development (X4)</p> <ul style="list-style-type: none"> • Activities: Adequate self safety training • Assessment: Need of training test • Evaluation: Post-training evaluation/assessment
<p>Management Commitments (X1)</p> <ul style="list-style-type: none"> • Vision & Mission: Importance and Prioritize • Policy: SOP development 	<p>Leadership (X3)</p> <ul style="list-style-type: none"> • Skills: Safety skills level • Supervisory: Routine meeting with subordinates

III. CONCLUSION

This research can provide a picture of how the conditions for the application of safety in the operation of PT KAI. Research has shown that people management is a positive contribution to the effect of the application of operational safety. By analyzing predictors, PT KAI to see any indicators that greatly affect the performance of the application of safety. Descriptive analysis indicators can see where at the application of safety that need to be repaired. To determine which action should come first, need to be established matrix of importance. Matrix can help PT KAI to create groundbreaking programs or effective policies to enhance the effects of railway operational safety.

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