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THE EFFECT OF THE LEVEL OF AWARENESS OF THE SAFETY MANAGEMENT SYSTEM (SMS) OF GROUND HANDLING OFFICERS BASED ON TRAINING DATA AT KOMODO LABUAN BAJO AIRPORT

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Abstract

Safety is a very important aspect in airport operations, especially for ground handling officers who have a high risk of work accidents. The implementation of the Safety Management System (SMS) is a system that must be understood and applied by all personnel, especially through training. This study aims to determine the influence of SMS awareness level on the work safety of ground handling officers based on training data at Komodo Labuan Bajo Airport. This type of research is quantitative with a causative associative approach. The sampling technique used was purposive sampling with a total of 53 respondents from ground handling officers. Data collection was carried out through observation and the distribution of questionnaires. The instruments were tested for validity and reliability, and the data were analyzed using simple linear regression and linearity tests. The results showed that there was a very strong relationship between SMS training and awareness level ($\rho = 0.824$) and there was a significant influence between SMS awareness and occupational safety (significance value < 0.05). This shows that training plays an important role in increasing awareness, and high awareness has a positive impact on occupational safety behavior.
Keywords: Occupational safety, Safety Management System (SMS), awareness, ground handling, training

Abstract

Safety is a crucial aspect in airport operations, especially for ground handling personnel who are exposed to high risks of work-related accidents. The implementation of a Safety Management System (SMS) is essential and must be understood and applied by all personnel, particularly through training. This study aims to determine the effect of SMS awareness on the safety performance of ground handling staff based on training data at Komodo Airport, Labuan Bajo. This research employed a quantitative method with a descriptive correlational approach. The sampling technique used was purposive sampling with a total of 53 ground handling personnel as respondents. Data collection was conducted through observations and questionnaires. The instruments were tested for validity and reliability, and the data were analyzed using linearitsas and simple linear regression tests. The results indicate a very strong correlation between SMS training and awareness level ($\rho = 0.824$) and a significant effect of SMS awareness on work safety (significance value < 0.05). This finding suggests that training plays a vital role in increasing awareness, and higher awareness contributes positively to safety behavior in the workplace.

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1. INTRODUCTION

The aviation industry is a very complex and high-risk sector, so occupational safety is one of the fundamental aspects that cannot be negotiated. Every activity on board, whether carried out in the air or on the ground, demands high safety standards and strict operational procedures[1]. One of the important parts of the aviation system is the service *ground handling*, which involves a series of technical and logistical activities carried out while the aircraft is on the ground. This activity includes loading and unloading baggage, refueling, cargo handling, and passenger service. The operational success of aviation is determined not only by the technical readiness of aircraft and air crews, but also by the crucial role of the officers *ground handling* who handle the work directly.[2]

In this context, the company *ground handling* who are airline partners have a great responsibility to implement high safety standards. Many companies are starting to adopt ISAGO *(International Standard for Ground Operations)*, which is a global standard set by IATA to ensure the conformity of operational procedures with international safety principles. The implementation of ISAGO is expected to improve work efficiency, minimize the risk of accidents, and create a professional and safe work environment. However, even though standards have been set, potential accidents can still occur if the safety culture is not fully embedded in every aspect of operations.[3]

In practice, the *ground handling* Face a variety of potential hazards that can threaten safety, ranging from physical injuries from heavy equipment to procedural errors that have the potential to cause flight incidents. Research conducted in Kenya shows that passenger and cargo handling practices have a significant influence on flight safety performance, indicating that the effectiveness of training and the implementation of standards is critical [4]. These findings confirm the importance of rigorous technical training, standardized handling procedures, and the adoption of best practices in the officer's work system *ground handling*.[5]

One of the systematic approaches developed in the world of aviation to improve safety is *Safety Management System* (SMS). SMS is a framework that integrates safety policies, risk management, incident reporting, and the development of a comprehensive safety culture. The success of SMS implementation depends not only on the availability of regulations and procedures, but also on the safety culture that lives in the organization. Safety culture reflects the commitment, attitude, and concern of all elements of the organization to the importance of maintaining work safety. Strong safety culture within the company *ground handling* plays a very important role in reducing the number of work accidents. However, in many cases, the safety culture in the sector still does not reach the ideal level and needs further strengthening [6].

Komodo Airport in Labuan Bajo, East Nusa Tenggara, is one of the strategic airports in Indonesia that has experienced significant growth as the regional tourism sector develops. This airport was originally named Mutiara II Airport and was officially renamed Komodo Airport to reflect the local tourist identity. Since the inauguration of the new

terminal by President Joko Widodo on December 27, 2015, this airport has continued to undergo development both on the air and land sides, in order to increase capacity and service quality. As the main gateway to leading tourist destinations such as Komodo National Park, the increase in the number of tourists has a direct impact on the intensity of *ground handling* activities, which indirectly increases potential occupational safety risks. To support the safety aspect, *Safety Management System* (SMS) training has been provided periodically to *ground handling* officers. Based on data from the operational safety division (*safety office*), from 2022 to early 2024, as many as 80 *ground handling personnel* have participated in SMS training which includes operational modules, strengthening safety attitudes, and knowledge of incident reporting systems.

However, the results of the evaluation show that the level of awareness of the implementation of SMS in the field is still not optimal. Approximately 60% of officers showed improvement in terms of compliance with post-training procedures, while only 55% actively participated in hazard reporting and routine safety briefings. The data indicates a gap between the training materials provided and awareness in its implementation. This gap can be caused by various factors, such as low internalization of training materials, lack of supervision, or lack of commitment to safety culture.

To overcome these problems, comprehensive strategic steps are needed, such as increasing officers' understanding of occupational safety procedures, implementing routine training related to the implementation of *the Safety Management System* (SMS), and strengthening the supervision system in the *ground handling* work environment. Training not only functions as a form of regulatory compliance, but also as an effort to form a work mindset and attitude that prioritizes safety. If the level of awareness of the importance of safety standards is still low, then the operational quality of flights can be threatened and potentially increase the risk of work accidents. Therefore, all parties involved in the cargo handling and operations process on land must have a strong commitment to building a solid safety culture. Thus, it is hoped that flight operations can run more safely, efficiently, and professionally, while supporting the continuity and positive image of Komodo Airport as a national tourism gateway.

Based on this description, it can be concluded that effective training has an effect on the level of awareness of *ground handling officers* towards the implementation of the *Safety Management System* (SMS). Therefore, the author is interested in studying and analyzing this problem further in the form of scientific papers outlined in the final project with the title:

"THE EFFECT OF THE *LEVEL OF AWARENESS OF THE SAFETY MANAGEMENT SYSTEM* (SMS) OF *GROUND HANDLING* OFFICERS BASED ON TRAINING DATA AT KOMODO LABUAN BAJO AIRPORT".

METHOD

The approach used is a quantitative approach.[7] The location of this research was chosen purposively considering that the author conducted On The Job Training in the cargo handling division of Komodo Airport.

In this study, the population used as an object was all ground handling officers working at Komodo Airport. These officers are individuals who are directly involved in the process of servicing and handling aircraft

on the ground, so they are closely related to the implementation of Safety Management System (SMS) training and the implementation of a work safety culture. Data collection was carried out in the period from December to February 2024, with a total population of 114 personnel. This population consists of operational ground handling officers, cargo service officers, and supervisors from ground handling service providers who are on duty at Komodo Airport. The sample was determined to be 53 people from 114 populations.

Data collection in this study was carried out through two main techniques, namely observation and questionnaire[8]. Observations were used to obtain direct data on the implementation of safety procedures in ground handling activities at Komodo Airport, which were then compared with international regulations such as the International Standard of Ground Operation Manual and Annex 19 on Safety Management System (SMS). Meanwhile, the questionnaire was aimed at measuring personnel's understanding of the workplace safety culture after participating in SMS training. The data obtained were analyzed using descriptive and quantitative approaches to provide an objective picture and identify the relationships between variables. Validity and reliability tests were conducted using SPSS to ensure the accuracy and consistency of the questionnaire, with Cronbach's Alpha as a reliability indicator. The normality test using the Kolmogorov-Smirnov and Shapiro-Wilk methods ensures a normal data distribution, while the linearity test tests the linear relationship between SMS awareness and occupational safety. Heteroscedasticity tests were performed to determine the stability of residual variance in the regression model using the Glejser method. Furthermore, simple linear regression analysis is used to find out the direct influence between independent and dependent variables. This research was carried out at the cargo supervision and handling unit of Komodo Airport, which is also the location of the researcher's On The Job Training.

RESULTS AND DISCUSSION

1. Validity Test

   The validity test is carried out to measure the extent to which research instruments, such as questionnaires, are able to produce accurate data and in accordance with the research objectives (Sugiyono, 2018). The author validated the questionnaire to two experts, in this case the first and second supervisors. The first validator is Mr. Ir. Hadi Prayitno, S. ST., M. A., as the supervisor I. The second validator is Mrs. Lusiana Dewi K, M. Pd., M. Pd., as the supervisor II. The results of the questionnaire validation carried out by the expert can be seen in the appendix.

   In this study, the validity test was also carried out using the help of SPSS software. The data is declared valid if the R value calculated per statement item is greater than the R of the table (R is calculated > R table) or the significance value is less than 0.05 (Sig value < 0.05).

2. Reliability Test

   The Reliability Test aims to measure the internal consistency of the research instrument, in this case a questionnaire used to collect data on the understanding and behavior of occupational safety. Reliability refers to the extent to which the

measurement results are reliable or consistent if repeated.

This study used SPSS statistical software, the Cronbach Alpha coefficient was calculated to assess the extent to which the items on the questionnaire correlated with each other. If the Cronbach Alpha value indicates a number greater than 0.7, then the instrument can be considered reliable.

3. Simple Linear Regression Test

A simple linear regression test was used to answer the second objective, which was to determine the influence between SMS awareness levels based on training data. The test results can be seen in Figure 2 and Figure 3 as follows:

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	2.261	.101		22.313	.000
	X	.227	.007	.974	30.459	.000

a. Dependent Variable: Y

Figure 2 Simple Linear Regression Test

Source : SPSS (2025)

Based on the test results in Figure 2, the analysis results were obtained with the equation Y = 2.261 + 0.227x, meaning that every one unit increase in the SMS awareness level will increase safety performance by 0.227 units. The significance value of 0.000 < 0.05 shows that the regression model is statistically significant and the variable x (SMS awareness level) together affects the y variable (training data).

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.974[a]	.948	.947	.205

a. Predictors: (Constant), X

Figure 4. 9 Simple Linear Regression Test

Source : SPSS (2025)

Based on Figure 3, it can be seen that the R Square of 0.948 can be seen which shows that 94.8% of the variation in the training data variables can be explained by the level of awareness of SMS, while the remaining 5.2% is explained by other variables outside the model.

Discussion of Research Results

Based on the results of the questionnaire that has been obtained previously, it can be concluded that there is an influence on the level of awareness of the *Safety Management System* (SMS) of *ground handling* officers based on training data at Komodo Labuan Bajo Airport. The results can be seen in the discussion as follows:

This research supports previous findings by Rafasia & Meilani (2025) which states that effective training is able to improve competence and work awareness in the airport environment. Thus, these results demonstrate the importance of implementing continuous training to build a collective awareness of safety culture.

Analysis of the Relationship between Awareness Level and Training Data

Figure 1 Results of the Simple Linear Regression Test

Source : Processed Author (2025)

Before a simple linear regression analysis is carried out, a linearity test is first carried out to find out whether the relationship between independent variables (SMS awareness level) and dependent variables (training data) is linear. Based on the results of the linearity test using SPSS, information was obtained that the model could not calculate statistics because there was a "*no variance within groups*" statement,

which indicated that the dependent variable data (training data) had a too homogeneous distribution of values in the group of X variables. Nonetheless, visualization through *scatter plots* shows a linear relationship pattern, so linear regression testing can still be continued as part of a descriptive quantitative approach assuming that the model remains statistically representative of the relationships between variables.

A simple linear regression test was carried out to find out how much the level of awareness of the *safety management system* of *ground handling* officers was influenced based on training data at Komodo Labuan Bajo Airport. Based on the results of data processing using SPSS, a regression coefficient value (B) of 0.227 with a significance value (Sig.) of 0.000 which is smaller than 0.05. This shows that SMS training data has a significant effect on the level of awareness of *ground handling* officers.

The regression equations obtained from this analysis are:

Y = 2.261 + 0.227X, which means that every one unit increase in SMS training will contribute 0.227 point increase in the officer's awareness level.

In addition, the results of the t-test showed a calculated t-value of 30.459 with a standard Beta coefficient of 0.974, which indicated a very strong and positive relationship between training data and SMS awareness. This means that the more frequent and quality the training provided, the higher the level of awareness of officers on the importance of a workplace safety culture. These findings show that SMS training is not only a formality, but also has an impact on the cognitive (knowledge), affective (attitude), and psychomotor (action) aspects of *ground handling* officers in carrying out daily tasks according to safety standards.

The results of this study support the findings of Rafasia & Meilani (2025), which states that effective training is able to improve competence and work awareness in the airport environment. These findings reinforce that awareness of safety systems is not only formed from technical instruction, but from learning experiences and strengthening organizational culture. This is in line with the opinion [10], which emphasizes that awareness of safety protocols is an important indicator in reducing the potential for work accidents in the field, because awareness includes aspects of knowledge, attitudes, and work behavior that are in accordance with procedures.

Literature support is also demonstrated by [11] which emphasizes that safety training plays an important role in improving an individual's perception and understanding of potential risks and mitigation procedures. This means that training is not only a transfer of technical knowledge, but also as a formation of a proactive work attitude towards hazards in the work environment. In this case, the regression results show that the high awareness is directly proportional to the high understanding of occupational safety formed through training.

Moreover [12] It also states that training has an important contribution to improving employability and creating a positive attitude towards safety rules. Therefore, the results of this study confirm that structured and continuous training is a strategic tool to build a strong safety culture, as well as an important investment in strengthening individual awareness to always act in accordance with the standard operating procedures (SOPs) of safety in the airport environment.[13]

COVER

Conclusion

Based on the results of observations and research that have been carried out through the process listed from chapter I to chapter IV, the author gets several conclusions related to the influence of the level of awareness of the Safety Management System (SMS) of ground handling officers based on training data at Komodo Labuan Bajo Airport. The conclusions that the author can draw are as follows:

There is a significant influence between the level of awareness of the Safety Management System (SMS) of ground handling officers based on training data at Komodo Labuan Bajo Airport. Based on the results of the simple linear regression test, the regression coefficient value B = 0.227 with a significance value of 0.000 was obtained, and t calculated = 30.459 > t table, which means that the increase in SMS awareness of ground handling officers was directly influenced by the training data. Every one unit increase in the implementation of SMS training will increase the level of ground handling officers' awareness of work safety by 0.227 units, as shown by the regression coefficient of the analysis results. This shows that SMS training data makes a great contribution in shaping officers' awareness of the implementation of the overall work safety system, both in terms of knowledge, attitudes, and operational actions in accordance with safety procedure standards.

The regression model fulfills the assumption of linearity, as shown by the results of scatter plots and linearity testing that illustrate the linear relationship between SMS awareness variables and training data. However, there was an indication of heteroscedasticity based on the Glejser test (significance value < 0.05), which showed the inconsistency of the residual variance. However, regression models can still be used, but they need to be interpreted carefully to the standard error values.

This research corroborates previous literature such as Rafasia & Meilani (2025), Purba (2017), Kristiana & Wibowo (2024), and Woru et al. (2023), which emphasizes the importance of safety training in shaping attitudes, understanding, and work behaviors that are in harmony with safety culture. Training is a strategic means in building collective awareness of a safe work culture in the airport environment. Structured and ongoing training has a significant impact on increasing occupational awareness and safety.

Suggestion

Based on the above conclusions, the researcher has several suggestions that can be useful as input in an effort to solve several existing problems. These suggestions include the following:

1. It is necessary for the management of Komodo Labuan Bajo Airport, it is recommended to continue to improve the quality and frequency of SMS training. The training is not only theory-based, but also includes simulations, case studies, and hands-on evaluations in the field, so that officers can understand and apply safety concepts in real life.
2. For ground handling officers, it is hoped that they can be more active in participating in training and applying this knowledge in the workplace. It is important to maintain personal awareness and discipline in implementing SOPs and the consistent use of PPE to minimize the risk of work accidents.

3. For subsequent researchers, it is recommended to include additional variables such as work environment, leadership, and work motivation, and consider the use of a mixed-method approach to understand broader factors in SMS implementation.
4. Given the discovery of indications of heteroscedasticity, it is recommended to use a robust regression approach or data transformation, so that the estimation results become more accurate and meet the classical assumptions of regression.

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