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Influence of Safety Communication on Implementation of Safety Oversight Program at Jomo Kenyatta International Airport

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Abstract: ***Implementation of safety oversight programs in Aerodromes is an important aspect in ensuring safe travel. Safe operations in aerodromes with high volumes of air traffic requires a systematic approach to management of safety and safety assurance is only possible with enhanced communication among the various stakeholders. Jomo Kenyatta International Airport as a regional hub has experienced steady growth of passenger volumes connecting various destinations in Africa and around the world since late 1950s. This growth is not at par with the existing infrastructure, creating capacity challenges, which requires necessary mitigation to maintain acceptable safety levels. With varying stakeholders, the drive for better safety communication cannot be overemphasized. The research examined influence of safety communication on implementation of safety oversight program at Jomo Kenyatta International Airport. The variables under study were modes of communication, information management, feedback mechanisms and communication barriers. The study adopted descriptive research with participants from Kenya Airports and Civil Aviation Authority. Data was collected through questionnaires and analyzed using SPSS to derive descriptive and inferential statistics to make meaning out of the data and resultant findings. Analysis of Variance tested the hypothesis and regression analysis giving the impact of independent variable on the dependent. A model Y =2.54 +6.32X+0.29 resulted from regression analysis. The study findings showed significant influence on the implementation of safety oversight programs in aerodromes. The correlation coefficient was 0.725 and a coefficient of determination of 0.511 indicating a 51% variability in implementation attributable to Safety communication. Based on the study findings, Airports and Civil Aviation Authorities should choose the correct mode of communication while managing information to enhance performance. In addition, there is great need to improve the identification and prompt address of safety communication barriers.***

Keywords: Safety Communication, aerodromes, implementation of safety oversight program

1. Introduction

The International Civil Aviation Organization (ICAO) is a specialized agency of United Nations (UN) which deals with promoting development of a safe and orderly International Civil Aviation. It endears to improve safety outcomes by a number of coordinated activities, which includes key safety trend checks and pointers and implementation of agendas to deal with safety concerns among others. In recent years, scheduled commercial flights numbers increased by 4.5 % globally. This necessitates implementation and developments that is at par with the growth that enables coordinated progress and expansion towards new safety initiatives. To achieve this, ICAO on a systematic manner uses Universal Safety Oversight Audit Program in monitoring the member states address of issues related to safety. In the implementation of SARPS, ICAO developed eight areas of audit for effective oversight of state safety. ICAO expects that the state through the regulatory agency address all the eight elements regarded as critical, and representing the all-inclusive spectrum of activities in the civil aviation system and categorized as establishing and implementing critical elements (ICAO, 2011)[1].

Globally, Inter-Agency task force on financing for Development as published by ICAO Safety report, 2016 reveals low level of Aerodromes and Ground Aids Effective implementation (AGA EI) particularly in international aerodromes certification requirements. Gaps existing in aviation infrastructure accounted for the low performance in AGA EI with the following main reasons; - poor aerodrome regulatory framework among states, lack of robust aerodrome certification and safety assessment mechanism including safety communication (ICAO, 2016)[2].

Africa has had remarkable progression in the aviation arena over the last few decades owing to the growing economy and consequently the demand for domestic and foreign air travel (Boehmer, 2013)[3]. Africa continent only accounts for 3% of the global aviation. However, it has historically held one of the poorest safety records among all the regions. This accounts for approximately one accident per 270,000 flights compared to global average of one accident in 5,000,000 flights. This result from social issues that hinder growth and implementation of better infrastructure and safety initiatives (Pasztor, 2014)[4]. IATA and ICAO have pointed out to nationalistic interests and lack of cooperation between African states (Boehmer, 2013)[3]. Of the accidents reported between 2004 -2013 in Africa, 80% took place in Eastern and Southern parts of the continent (Amadou, 2015)[5]. However, ICAO has been in communication with stakeholders and there are concerted efforts to improve safety oversight through Regional Groups and Oversight Organizations (ICAO, 2016)[2]

Kenya Civil Aviation Authority is in charge of regulatory functions of safety, security and economic oversight of

Air Services, Aerodrome Operations, providing Air Navigation Services (ANS) and training in aviation among others. It aims at ensuring the aviation industry in Kenya achieves highest compliance with ICAO provisions. This is achieved though ICAO - USOAP by ensuring that global aviation standards are achieved by each signatory state. ICAO audited Kenya under the USOAP in 2008 and 2013. These audits revealed an interesting trend in relation to the effective implementation of critical elements (CEs). ICAO noted that although Kenya had performed well in the critical elements establishing a regulatory system, the CEs concerning implementation such as, surveillance and resolution of Safety issues remained low at 61 and 51 % respectively. (KCAA, 2013)[6].

2. Literature Review

Iacob (2017)[7] defines communication as the method of conveying information, concepts, thoughts and appraisals from one person or group of persons to another. She argues that as an attribute of human beings, no activity is conceivable outside communication irrespective of their complexity. William and Sawyer(2003)[8] states that communication associated to safety is the utmost real way to advance safety ethos in a business. Geller (2001)[9] argues that the attitude that breaks down safety feedback in an organization is a feeling of lack of competency among Co-workers, as they do not want to create interpersonal conflicts with their seniors. A study by Vecchio–Sadus (2007)[10] on Commonwealth Scientific and Industrial Research Organization (CSIRO) minerals showed that most work-related injuries resulted from unsafe working culture. She cited clear and constructive safety communication as key to prevent at-risk behaviour and improve safety culture. In addition, safety culture provided cohesion and supportive framework for purposeful performance at CSIRO Minerals, Australia. Vecchio-Sadus concluded that appropriate lines of communication and feedback mechanisms among others improved safety communication at work place. This led to enhanced cooperation, support and increased participation in safety programs.

A study by Morrow (2014)[11] investigating the connection between safety ethos and performance in nuclear and published in United States Nuclear Regulation Commission (USNRC) Safety Culture Trait Talk argues that effective safety communication is important in maintenance of safety culture. Willingness of employees to give and receive feedback is dependent on their regular communication with each other. The conflict caused by lack of clear communication cannot be overemphasized. In addition, exchange of information is essential to organization learning and safe operation. There is thus need to address communication barriers which has a greater influence to safe performance. The way we communicate influences safety process irrespective of whether we are understood or not and determines the acceptance or rejection of any process. Krivonos (2007)[12] suggests the importance of communication as an integral function in aviation safety. This is because of crucial nature of communication. He cites the study done by Helmreich and Foushee on aircraft accident statistics, which concludes that 70% of calamities involved human miscalculation subsequent from failure in interactive exchange of information. This agrees with the study by Krifka, et al. (2003)[13] that posits 80% of all aviation calamities in the last 20 years related to interpersonal communication.

3. Research Methodology

The researcher adopted descriptive research design and used the questionnaire with both structured and unstructured questions as the instrument for data collection. Descriptive statistics were determined i.e. mean and standard deviation while inferential statistics were correlation and regression analysis. Analysis of variance was used to test the hypothesis.

4. Findings

The study examined the extent Safety Communication determine implementation of safety oversight program in aerodromes. Descriptive and inferential statistics were determined using SPSS to assess opinions of the staff sampled in the study, test hypothesis and derive a linear model.

4.1 Descriptive Statistics for Safety Communication and Program Implementation

To establish the extent safety communication determines implementation of safety oversight programs in aerodromes, the respondents were provided with a list of statements related to the third independent variable and requested to point out the extent of agreement with each of the statements by indicating as applicable along a five – Likert scale. *Given:* 1 is No extent; 2 is a small extent; 3 is Neutral; 4 is some extent; and 5 great extent. The responses are shown in table 1.

Table 1: Safety Communication and Program Implementation Responses

Statement	Mean	SD.
Safety Communication determines implementation of Safety Oversight Program in Aerodromes	4.56	0.592
There is a clear safety communication channel accessible by all safety related personnel	3.85	0.881
Safety communication determines implementation of safety oversight program	4.39	0.769
The modes of communication determine how fast information regarding safety is exchanged and actions taken	4.44	0.702
There is a clear policy on management of safety related information.	4.28	0.785
The Aerodrome Operator has established a data base for all safety related information	3.93	1.057
Safety related issues raised by staff are addressed	3.68	1.042

and feedback given by management in the implementation of safety programs		
Any requests to the Civil Aviation Authority with regard to promulgation of safety related information is done in a timely-manner and communicated to the Aerodrome Operator	3.65	0.951
Communication barriers are identified and addressed promptly	3.25	1.054
I am satisfied with Safety communication process	3.47	1.001
Average	3.94	0.883

N = 75 SD = Standard Deviation

The results indicated that safety communication strongly determined the implementation of safety oversight program at Jomo Kenyatta International Airport. The mean response was 4.56 in the Likert Scale used and standard deviation found to be 0.592. However, the respondents were unsatisfied with communication processes as used by the relevant organizations. They had reservations with regard to feedback from management on handling of safety issues raised by staff, establishment safety database and identification and prompt address of existing communication barriers.

4.2 Correlation Analysis Safety Communication and Program Implementation

Spearman's Rank correlation coefficient was determined to explore the link between safety communication and implementation of safety oversight programs and found to be 0.725. The value falls within the bracket of high correlation and indicated a strong association amongst the two variables. The finding was significant at 0.013 for a two-tailed analysis at 95% confidence level.

4.3 Test of Hypothesis for Safety Communication and Program Implementation Factor

The null hypothesis for this variable was stated as;-
H1: Safety Communication does not determine the implementation of safety oversight program in Kenyan aerodromes.
To test the hypothesis, Analysis of Variance was performed to compute the F value for the samples. The results were given on table 2.

Table 2: ANOVA for Safety Communication and Program Implementation

Model		Sum of squares	Df.	Mean square	F.	Sig
1	Regression	11.774	10	1.177	2.170	.032
	Residual	33.101	61	.543		
	Total	48.475	71			

The results in Table 2 revealed F test value of 2.170 and 0.032 as p-value in an analysis performed at 95% confidence level. The critical value of variance for (10, 61) degrees of freedom obtained from F distribution table was 1.99. The study established existence of a significant goodness of fit with regard to safety communication and implementation of safety oversight programs as F-testvalue 2.17 exceeded the critical value and p value of 0.032 < 0.05. Thus, the acceptance of alternative hypothesis.

4.4 Regression Results for Safety Communication and Program Implementation

Linear Regression Model (LRM) of the form of $Y= \beta 0 + \beta 3X3+ \varepsilon$ determined existence of a link on safety communication (X3) and the implementation of safety oversight programs (Y). The analysis was performed at 95% confidence level and the results summarized and presented in tables 3 and 4.

Table 3: Simple Regression on Safety Communication and Program Implementation

Model	R.	R. square	Adjusted R. square	Std Error	Sig
1	.715[a]	.511	.508	.019	0.011
a.Predictors: (Constant), Modes of communication, Information management, feedback mechanism b. Dependent Variable: Implementation of safety oversight program					

Table 4: Multiple Regression Coefficient for Safety Communication and Program Implementation

Model		Unstandardized Coefficients		T	Sig.
		B	Std. Error		
5	(Constant)	2.54	0.97	2.120	0.002
	Safety Communication	6.32	0.29	1.88	0.002

The results in Table 3 and 4 indicated high correlation between safety communication and implementation of safety oversight programs with coefficients of 0.715. The two values were statistically significant since the p-values were 0.001 and 0.002 for analyses at 95% confidence level. The computed coefficient of determination was 0.511 and an unstandardized coefficient of 6.32. This implied that about 51% variability in implementation of safety oversight programs was attributable to variability in safety communication. The resultant Linear Model was $Y= 2.54 + 6.32\ X_3+ 0.29$ indicating a major contribution of the variable.

4.5 Summary of the findings

Safety communication had a high determination on implementation of safety oversight programs at JKIA and indeed aerodromes. Choice of modes of communicating safety elements from the management to the staff as well as information management were two most highlighted elements which if addressed would enhance performance.

The majority (68%) of the respondents alluded to the fact that Kenya Airports Authority had established a database for all safety related information in Jomo Kenyatta International Airport while about one third were of the opinion that feedback was lacking in the communication loop. This was correlated further by greater than 50% of

respondents who observed that safety communication barriers were neither identified, nor addressed by the management within the required timelines. More than 90% were of the view that employment of correct modes of communication would result in to faster flow of safety information and consequently prompt a corrective action. The choice of an appropriate mode of communicating safety concerns and correct management of information flow directly determine the compliance and resolution of safety concerns.

The study findings bore resemblance outcomes of other researchers. William and Sawyer (2003)[8] who noted that communication relating to safety is the utmost effective approach to advance a culture of safety in any given entity. This was evident from the high correlation between safety communication and implementation of safety oversight programs. Vecchio–Sadus (2007)[10] further supports this by alluding that constructive safety communication is key to prevent at-risk behaviour and improve safety culture and Krivonos (2007)[12] describing communication as an integral element in aviation safety.

5. Other recommendations

The findings showed strong influence of safety communication to the implementation of safety oversight programs at Jomo Kenyatta International Airport. The Airports Authority, in realizing the essential role of safety communication, has put some focus on elements of safety communication. However, there is need for a system approach towards all variables to enhance performance. Elaborate communication system that includes feedback mechanisms would highly improve the implementation of safety oversight programs. The study recommends that Management in Kenya Airports Authority (KAA) and Kenya Civil aviation Authority (KCAA)to put more emphasis on safety communication in order to achieve high level of implementation to the provisions and requirements that primarily form basis of civilian air travel operations. Making sure that each employee and department are clear as to what is required of them is one of the first steps to increasing productivity. This is by ensuring that defined goals and objectives as well safety targets are clear by all. The prioritization of modes of communication enhancing feedforward and feedback mechanisms between management and staff is recommended. In addition, there is need to create synergy in addressing the gaps identified to enhance safety in aerodromes.

References

[1] ICAO. (2011). State of Global Aviation Safety: Safety Analysis. Montreal: International Civil Aviation Organisation.
[2] ICAO. (2016). Safety Report. Montreal Canada: International Civil Aviation Organization.
[3] Boehmer, J. (2013). Africa a Land of Aviation Opportunities and Obstacles. Vol 30 Issue 18. New Jersey: Business Travel News.
[4] Pasztor, A. (2014). African Air Safety Trails Rest of World. NewYork: Wall Street Journal. Retrieved from Wall Street Journal: http://www.wsj.com/articles/SB10001424052702304887104579302904075115882
[5] Amadou, J. J. (2015). Promoting Aviation Safety in Africa: Analysis of Air Accidents in the Region between 2004 and 2013. (pp. 43-48). Dayton: Wright City University.
[6] KCAA. (2013). KCAA Strategic plan 2012/13 to 2016/17. Abridged Version. Nairobi: Kenya Civil Aviation Authority.
[7] IACOB, S. E. (2017). Communication, a premise of efficiency and effectiveness in current society. Valahian Journal of Economic Studies, 8(22)(2), 25-30. doi:10.1515/vjes-2017-0015
[8] Williams, B. K., & Sawyer, S. C. (2003). Using Information Technology : A Practical Introduction To Computers And Communications: Complete Version (5 ed.). Boston MA: McGraw Hill.
[9] Geller, E. S. (2001). Keys to Behavior-Based Safety from Safety performance Solutions. Rockville, MD: Government Institutes Inc.
[10] Vecchio-Sadus, A. M. (2007). Enhancing safety culture through effective communication. Clayton South VIC,: CSIRO Process Science and Engineering.
[11] Morrow S., G. K. (2014). Effective Safety Communication, Safety Culture trait talk. United States Nuclear Regulatory Commission. Washington, DC, USA: Elsevier Ltd.
[12] Krivonos, P. D. (2007, June 9-10). Communication In Aviation Safety: Lessons Learned and lessons Required. Retrieved from Researchgate.net: https://www.researchgate.net
[13] Krifka Manfred, S. M. (2003). Group Interaction in the Cockpit: Some Linguistic Factors. (R. Dietrich, Ed.) Communication in High risk environments(12), 75-101.

Author Profile

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