The Implementation of Safety Management System in Airlines

Mourad Elwezza[1] Magda El-Badry[2] Toka Mahrous Fahmy[2]

[1]Cabin Crew Instructor

[2]Faculty of Tourism and Hotels, University of Sadat City

Abstract

This research tackles the implementation of Safety Management System in Airlines. That was accomplished through survey, designed as a main tool of the research, consists of 5 sections which were set according to International Civil Aviation Organization's (ICAO) Safety Management System frame work. The research sample is exhaustive for all employees of case studied airline at various administrative levels, as everyone is required for basic and periodic Safety Management System (SMS) training. The research proofed decencies in the implementation process of safety management system in several dimensions and developed several recommendations for better implementation of the system.

Keywords: Safety, Management, Airlines, Implementation.

1.1 Introduction

Air travel is undoubtedly central to the globalization taking place in many other industries as it facilitates economic growth, trade, international investment, and tourism. On average, travel for both business and leisure purposes grew exponentially worldwide over the last decade with about three billion people using air transport in 2012 and the annual passenger figure increasing by 4.7% since 2011 (ICAO, n.d.). In addition, the total scheduled passenger traffic grew at a rate of 4.9% in terms of revenue passenger kilometers (RPKs) in 2012 (ICAO, n.d.). This increase necessitates global air transportation cooperation worldwide which is, as stated in Article 44 of the Chicago Convention, one of the major objectives of the ICAO, to ensure the safe and orderly growth of international civil aviation throughout the world" (ICAO, 2006a).

The importance of SMSs was recognized by the ICAO who required all contracting states to implement an SMS by January 1, 2009 (European Transport Safety Council (ETCS), 2009). The management of safety via a performance-based approach is best represented by a SMS (safety management system) since performance-based regulation concentrates on measurable outcomes to assess system safety performance. This new approach increases the responsibility of service providers, who exercise day-to-day control over the maintenance of a safe operating environment, to focus on safety throughout the organization's structures, policies, and procedures (Department of Infrastructure and Transport, 2011).

Accordingly, this research is designed to contribute to the pool of knowledge by meeting the following objectives: -

1. Explore how a safety management system (SMS) is implemented by commercial aviation operators.
2. Evaluate the implementation of Safety management System in airlines.
3. Develop recommendations concerning Safety management system implementation in airlines.

The research addresses the following question:

1. What are the deficiencies in the Safety management system implementation process?

2. Literature Review

2.1 Evolution of Aviation Safety

Within the context of aviation, safety is the state in which the possibility of harm to persons or property damage is reduced, and maintained at or above an acceptable level by a continuing process of hazard identification and safety risk management (ICAO, 2013). ‘Aviation safety’ is a term encompassing the theory, investigation, and categorization of flight failures, and the prevention of such failures through regulation, education, and training (ICAO, 2009).

2.2 Approaches to Safety

The design and implementation of a SMS has the potential to be a major change to the organisation and consequently can generate new safety hazards. The use of a safety assessment tool coupled with a group of experienced managers systematically questioning and challenging all aspects of the organisation’s current and planned approach to safety management should reduce the risk of unintended consequences in implementation of the SMS; enhance the group’s knowledge of the current situation and requirements; and prepare the way for effective implementation change (ICAO, 2006b).

2.3 Definition of a Safety Management System (SMS)

The Civil Aviation Safety Authority (CASA) in Australia defines a SMS as “systematic approach to managing safety, including the necessary organisational structures, accountabilities, policies and procedures” (CASA, 2009). The Civil Aviation Authority of Singapore (CAAS) defines a SMS as “a systematic, explicit and proactive process for managing safety that integrates operations and technical systems with financial and human resource management to achieve safe operations with as low as reasonably practicable risk” (Civil Aviation Authority of Singapore [CAAS], 2008). The UK Civil Aviation Authority (CAA [UK]) defines a SMS as “an explicit element of the corporate management responsibility which sets out a company’s safety policy and defines how it intends to manage safety as an integral part of its overall business” (Civil Aviation Authority CAA [UK], 2002). In an update to this definition, the UK CAA states that, “A SMS is a proactive and integrated approach to safety. It should be integrated into the management system of an organisation (CAA [UK], 2010).

2.4 Reasons for Implementing SMSs in Aviation

The main reason for the implementation of SMSs by ICAO member states is due to their obligations to comply with ICAO's international standards and procedures. There is a strong economic and safety case for developing and implementing a safety management system (SMS). Potentially, an effective SMS can result in a reduction in incidents and accidents, a reduction in direct and indirect costs, safety recognition by the travelling public, reduced insurance premiums, reduced loss of staff productivity, and proof of diligence in the event of legal or regulatory safety investigations (CASA, 2009). In addition, mandating SMSs would overcome the limitations of the exclusive use of technical and operational standards in a rapidly expanding industry with global interconnectedness (CASA, 2008). This would complement the current prescriptive approach with a more performance-based approach by giving legislative effect to the SMS requirement contained in ICAO Annex 6 Part 1 that requires operators to implement a safety management system (SMS) (CASA, 2008). In its recognition that safety cannot be achieved by simply introducing rules or directives concerning the procedures to be followed by operational employees, the Civil Aviation Authority of Singapore (CAAS) states that safety must encompass most of the activities of the organization. The CAAS continues by stating that SMSs have much in common with modern quality assurance practices, but place even more emphasis on proactive hazard identification and risk analysis.

> Safety management systems (SMS) help companies identify safety risks before they become bigger problems. Transport Canada regulations require the aviation industry to put safety management systems in place as an extra layer of protection to help save lives (Transport Canada [TC], 2012).

2.5 International Civil Aviation Organization (ICAO) SMS Model

The International Civil Aviation Organization (ICAO) safety management Standards and Recommended Practices (SARPs) address the activities of approved training organizations; international aircraft operators; approved maintenance organizations; organizations responsible for the design and/or manufacture of aircraft; air traffic service providers; and certified aerodromes.

The ICAO safety management SARPs addresses three distinct requirements:

a) Requirements regarding the State Safety Program (SSP), including the acceptable level of safety

b) Requirements regarding SMSs, including the safety performance of an SMS

c) Requirements regarding management accountability vis-à-vis the management of safety during the provision of services.

The ICAO safety management SARPs introduce the acceptable level of safety as a way of expressing the minimum degree of safety established by the state which must be assured by an SSP, and safety performance as the manner of measuring the safety performance of a service provider and the safety management system (SMS) (ICAO, 2009). In terms of the implementation of an SMS, ICAO recommends that the SMS should be commensurate with the organisation's size and the complexity of the services provided. The ICAO SMS framework is comprised of four components and 12 elements (ICAO, 2009) which are shown in figure 1.

ICAO SAFETY MANAGEMENT SYSTEM MODEL			
4 MAJOR ELEMENTS			
Safety Policy & Objectives	Safety Risk Management	Safety Assurance	Safety Promotion
12 SUB-ELEMENTS			
Management Commitment & Responsibility	Hazard Identification	Safety Performance Monitoring & Measurement	Training & Education
Safety Accountabilities	Safety Risk Assessment & Mitigation	The Management of Change	Safety Communication
Appointment of Key Safety Personnel		Continuous Improvement of the SMS	
Coordination of the Emergency Response Plan			
SMS Documentation			

Source: (Bayuk, 2008).

Fig. 1: ICAO SMS Model

2.6 Key SMS Features

According to Bayuk (2008), there are four key SMS features, namely:

- ✓ Top management commitment to safety: This is an important attribute as the attitudes and actions of management can significantly influence the culture of the entire workforce. Therefore, it is critical that the organisation's leaders commit to the success of an SMS's implementation (Bayuk, 2008).
- ✓ A proactive hazard identification process and reporting structure: The continuing prompt identification and reporting of hazards can potentially save a significant amount of time and resources at a later stage (Bayuk, 2008).
- ✓ Timely and appropriate actions taken to manage risks to a level that is as low as reasonably practicable (ALARP): A system must be in place to control logical approaches to respond to known risks and to mitigate the risks to a level which allows for continued safe operation (Bayuk, 2008).

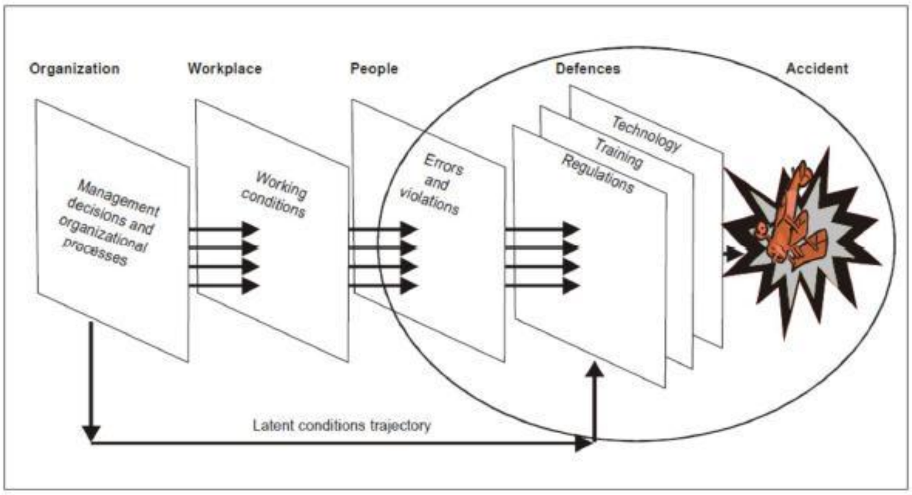
- ✓ A robust change management program to evaluate changes and safety actions: The continuing appraisal of the impacts of risk management actions is necessary to ensure a closed-loop process for determining if further remedial activities are required (Bayuk, 2008).

2.7 System Safety and SMSs

The MIL-STI-882 document is used by the US Department of Defense (DOD) to provide a standard, generic method for the identification, classification and mitigation of hazards (Department of Defense, Standard Practice, 2012). ‘System safety’ as defined by MIL-STD-882 is, “the application of engineering and management principles, criteria, and techniques to achieve acceptable mishap risk, within the constraints of operational effectiveness and suitability, time, and cost, throughout all phases of the system life cycle” (New England Chapter of the System Safety Society, 2002).

A major difference between SMSs and system safety is that SMSs take a proactive approach to safety management and proceed beyond prescriptive audits and checklist-based inspections to develop procedures and indicators that anticipate safety risks (Bayuk, 2008). To verify SMS performance, the civil aviation authority of the state should conduct oversight of the organisation’s performance on a periodic basis, and during the delivery of services. This would prove to be difficult if not impossible in practice, verifying the necessity for the safety performance indicators and safety performance targets of a safety management system (SMS). While acceptance and compliance oversight are prescriptive-based, oversight of safety performance indicators and targets is performance-based (ICAO, 2009).

The responsibility for a safe operation is spread throughout the different levels of the entire organisational structure in safety management systems (SMS). Such an approach increases the likelihood of more people responding to safety issues and reporting them, thus reducing the chance of a hazard being undetected. This approach follows Reason’s concept of the accident causation model as shown in Figure 2.



Source: (ICAO, 2013, p.2-3)

Fig. 2: Concept of Accident Causation

The implementation of every SMS will create a customized set of defenses or layers that coordinate to craft the safety culture. Each layer of defense has holes that symbolize the potential for a safety hazard to go undetected, because the layer may not be designed to manage that type of hazard or it may simply be missed, due to human error. Conversely, when these layers are combined by SMS principles, a hazard passing through all the defenses without being identified and mitigated is less likely. Commonalities between a SMS and a quality management system (QMS) are quite substantial as both require planning, performance monitoring, communication, and the participation of all employees.

3. Methodology

The purpose of this research is to measure the effectiveness of SMS implementation in airlines.

3.1 Research Design

The Instrumental case study is chosen for this research, which is the type used for understanding something more general than the case. To give an insight into a particular issue or build a theory.

For a case study research, multiply methods can be used to collect data, Interviews, observations, documents and surveys. In this research surveys were used which will be further described below.

3.1.1 Case Study Justification

The research used the case study for a number of reasons, including: The case study is a research method that is developed in a comprehensive manner, including: design, data collection methods, and qualitative entry points for data analysis. The objective of the case study: to provide richness and depth of information by capturing as many variables as possible to determine how a complex set of circumstances can affect the case of the research (Yin, 2003). The case study is a private working airline locates in Egypt – Alexandria- was selected because it is a full electronic SMS implemented airline, and well known for its commitment to the safety instructions issued by ICAO and the Civil Aviation Authority. It has a total of 77 employees, 15 employees who are new joiners were excluded. So a total of 62 surveys were distributed.

Out of (62) respondents, (52) surveys were returned, and when data is dumped, (5) surveys were excluded as they were invalid and therefore the study sample is (47). Thus the response rate received by the researcher is (86%).

3.2 Research Sample

The research sample is exhaustive for all employees of the surveyed airline at various administrative levels, since everyone is subject to basic and periodic SMS training, which is one of the requirements of ICAO and the Civil Aviation Authority.

3.3 Survey Form

A survey is designed as a main tool for the research, as the survey is effective in data collection. In addition it is more practical, quicker and could be analyzed more scientifically and objectively than other forms of research. The survey was presented to the specialists of the airline's safety program at the surveyed airline and was presented to professors at the University of Sadat City to test its validity. It consists of the following 5 sections which were set according to ICAO SMS frame work, shown in figure 1:
Part I: Safety Policy, Objectives and planning consists of six dimensions.
Part II: Safety Risk Management, consisting of two dimensions
Part III: Safety Assurance, consisting of four dimensions
Part IV: Safety Promotion, consisting of two dimensions
Part V: Respondents' Demographic Data
The number of statements in the survey is sixty-six, and weights have been given for each statement in the fifth Likert Scale.

3.4 Validity of the Survey

The survey is intended to be capable of measuring what it was built for which will led to achieving research objectives. The researcher relied on the ICAO SMS Frame and the Airline's Quality Safety performance Checklist in designing the survey to make sure the ability of statements and dimensions to measure research variables. Moreover, survey was presented to four of the specialists in the airline's safety program and two professors at the University of Sadat City to test its validity.

3.5 Reliability Statistics

The survey is intended to give almost the same results if it is re-applied to the same sample in the same circumstances again. Reliability is measured by the Cronbach's Alpha Test.

Table 1: Reliability Statistics

Cronbach's Alpha	N of Items
.966	66

The Cronbach's Alpha coefficient was calculated to verify the reliability of the survey statements. It was found to be 0.966, which is much higher than the accepted rate of 0,60 and confirms that the survey statements have a high reliability rate.
Thus the validity and reliability were both achieved and the final form of the survey was ready to be distributed.

3.6 Homogeneity of the Variances

To check whether the standard deviations of the sample are equal or not, the data was tested using Levene’s test.

Table 2: Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
Safety Policy, Objectives and planning	3.870	1	28	0.059
Safety Risk Management	0.646	1	41	0.426
Safety Assurance	32.554	1	36	0.000
Safety Promotion	3.107	1	36	0.086

As can be seen from table 3, the value of the Sig. is greater than 0.05 in most of the areas of research, so this indicates homogeneity of the sample populations.

3.7 Normality of Data Distribution

To explore whether the sample belongs to a population that is tracking a normal distribution data or not, Shapiro-Wilk test was used to test the normal distribution.

Table 3: Tests of Normality

	Shapiro-Wilk		
	Statistic	Df	Sig.
Management Commitment & Responsibility	.876	24	.007
Safety Accountabilities of Managers	.874	24	.006
Appointment of Key Safety Personnel	.765	24	.000
SMS Implementation Plan.	.832	24	.001
Coordination of the Emergency Response Plan	.862	24	.004
Documentation and Control	.869	24	.005
Hazard Identification process	.846	24	.002
Safety Assessment and Mitigation Process	.806	24	.000
Safety Performance Monitoring & Measurement	.830	24	.001
Management of Change	.841	24	.002
Continuous Improvement of SMS	.861	24	.004
Training & Promotion	.801	24	.000
Safety Communication	.782	24	.000

As can be seen from table 3, the P value of each research dimension is less than 0.05, which means that the sample is withdrawn from a community where its data do not follow the normal distribution.

3.8 Dumping the Initial Data and Interpreting Results

The researcher dumped and interpreted the data included in the research tool by computer, and used the (SPSS) Statistical Package for the Social sciences program to perform the appropriate statistical analysis, then the results have been derived for discussion to answer the research questions.

The significance level (0.05) which corresponds to a 95% confidence level has been relied on for interpreting results. The closer the arithmetic mean to (5), the closer the consensus among the respondents to the effectiveness of the application of the variable under research. The closer it is to (3), denotes a semi consensus among the sample the variable is average efficiency or availability and application. If the arithmetic close to (1), denotes closer consensus among the respondents this variable is not achieved or effective.

4. Results and Discussion

This part includes an overview of the results of the statistical treatments conducted on the sample and research questions, analyzes and discusses these results in detail; determine the level of statistical significance for each of them in addressing the Implementation of Safety Management System [SMS] in Airlines.

Table 4. Respondents' response to research dimensions

Dimension	Mean	Std. Deviation
Management Commitment & Responsibility	3.7907	0.68438
Safety Accountabilities of Managers	3.8301	0.61598
Appointment of Key Safety Personnel	2.8915	0.95942
SMS Implementation Plan.	3.9869	0.55762
Coordination of the Emergency Response Plan	3.7077	0.72263
Documentation and Control	3.5588	0.83455
Hazard Identification process	3.4709	0.74444
Safety Assessment and Mitigation Process	3.4370	0.66219
Safety Performance, Monitoring & Measurement	3.7889	0.81526
Management of Change	3.2963	0.82945
Continuous Improvement of SMS	3.5577	0.56621
Training & Promotion	3.5211	1.15458
Safety Communication	3.9079	0.45600

As can be seen from table 4, the mean of most of research dimensions are greater than 3.41 which means that the respondents accept the sub-variables, except for 2 dimensions; Appointment of Key Safety Personnel with mean value of 2.89 and Management of Change with mean value of 3.29, which reflects respondents' neutrality.

The following observations are extracted from table 4:

1. There is general acceptance of the dimension (Management Commitment & responsibility), with general arithmetic mean value of 3.79 and a standard deviation of 0.684, which indicates acceptance of the respondents for the management commitment & responsibility in the airline. This indicates the airline has a corporate safety policy, reflects the organizational commitment regarding safety. However these policies and responsibilities should be better utilized.
2. There is general acceptance of the dimension "Safety accountabilities of Managers", with general arithmetic mean value of 3.83, and a standard deviation of 0.6159, which indicates acceptance of the respondents for the Safety accountabilities for managers. That indicates management define lines of safety accountability throughout the organization include a direct accountability for safety as part of senior management.
3. The respondents expressed their neutrality for the dimension "Appointment of Key Safety Personnel", with general arithmetic mean value of 2.9 and a standard deviation of 0.959, which express they are not sure about the existence of safety personnel within the airline and whether they have the proper qualifications and authority or not. That reflects a poor SMS implementation and weakness of the assigned managers for Safety.
4. There is general acceptance of the dimension "SMS Implementation Plan", with general arithmetic mean value of 3.98 and a standard deviation of 0.557, which indicates that the airline has an accepted SMS Implementation Plan and is working on fully implementation of the system.
5. There is general acceptance of the dimension "Coordination of the Emergency Response Plan", with general arithmetic mean value 3.7 and a standard deviation 0.722, which indicates acceptance of airline's Emergency response Plan.
6. Respondents expressed their general acceptance of the dimension "Documentation and Control" with general arithmetic mean value of 3.55 and a standard deviation of 0.834, which means that they accept documentation and Control within the airline, which indicates SMS related documentations is sufficient and effective.
7. There is general acceptance of the dimension "Hazard Identification process", with general arithmetic mean value of 3.47 and standard deviation of 0.744, which means that the company has accepted hazard identification process represented in flight safety analysis program that provides identification of hazards and analysis of information and data associated with aircraft operations. Bayuk (2008) stated the continuing prompt identification and reporting of hazards can potentially save a significant amount of time and resources at a later stage.
8. There is general average acceptance of the dimension "Safety Assessment and Mitigation Process" with general arithmetic mean value of 3.437and a standard deviation of 0.662, which indicates that the airline has an accepted Safety Assessment and Mitigation Process represented in analyzing the existing and potential safety risks to aircraft operations.

9. There is general acceptance of the dimension "Safety Performance Monitoring & Measurement", with general arithmetic mean value of 3.788, and a standard deviation 0.8152, which shows acceptance for the quality of Safety performance monitoring & Measurement represented in the quality assurance program.
10. There is general acceptance of the dimension "Internal Safety Investigation", with general arithmetic mean value of 3.95 and a standard deviation of its value 0.648, which shows a significant agreement for the Internal Safety Investigation process within the airline, reflecting the airline has a proper process for investigation of aircraft accidents, incidents or events.
11. Respondents showed their neutrality for the dimension "Management of Change", with general arithmetic mean value of 3.296, and standard deviation 0.829, which reflect neutrality to level of Management of Change dealing with various types of change and wither the airline ensures safety risk is considered before internal or external changes are implemented.
12. There is acceptance of the dimension "Continuous Improvement of SMS", with general arithmetic mean value of 3.55 and a standard deviation of 0.566. That indicates accepted effort by the management for a continuous improvement of SMS.
13. There is general acceptance of the dimension "Training & Promotion" with general arithmetic mean value 3.521, and a standard deviation of a value of 1.154; this reflects acceptance of the employees with the scope of safety training and Promotion.
14. There is general acceptance of the dimension "Safety Communication" with general arithmetic mean value of 3.9 and a standard deviation 0.456, expresses an agreement among respondents. This indicate acceptance of the level of Safety communication within the airline and availability of means for disseminating information and data from the flight safety analysis program to appropriate operational personnel.

5. Conclusion

The Research titled "The Implementation of Safety management System in airlines". Three objectives were targeted; Explore how a safety management system (SMS) is implemented by commercial aviation operators, Evaluate the implementation of Safety management System in airlines, Develop recommendations concerning Safety management system implementation in airlines. After targeting research objectives, the research achieved several findings according to what have been reached in the research. The recommendations of the research are as follows.

5.1 Recommendations of the Research

According to what have been reached in the research, the recommendations are as follows.

5.1.1 Recommendations for Airlines

1. Utilizing "Management Commitment & responsibility in the airline", which could be implemented through a corporate safety policy, reflects the organizational commitment regarding safety.
2. Improving "Safety accountabilities of Managers", through defining lines of safety accountability throughout the organization include a direct accountability for safety on the part of senior management.
3. Enhancing "SMS Implementation Plan", which is the core of system implementation.
4. Emphasizing "Coordination of the Emergency Response Plan", which the research proofed to have average efficiency or availability of the Emergency response Plan. It is necessary to respond to major aircraft accidents or other type of adverse event that results in fatalities, serious injuries, considerable damage or a significant disruption of operations.
5. Enhancing "Documentation and Control" within the airline. It was weakly accepted within the airline, which indicates SMS related documentations need to be better used.
6. Utilizing "Hazard Identification process". The airline has average accepted hazard identification process represented in flight safety analysis program that provides identification of hazards and analysis of information and data associated with aircraft operations.
7. Revising "Safety Assessment and Mitigation Process" represented in analyzing the existing and potential safety risks to aircraft operations and ensures risk mitigation actions are developed and implemented in operations when required.
8. Improving "Safety Performance Monitoring & Measurement", by setting performance measures as a means to monitor the operational safety performance of the organization and to validate the effectiveness of safety risk controls.
9. Keep effective "Internal Safety Investigation", by developing processes for identifying and investigating irregularities and other non-routine operational occurrences that might be procedures to an aircraft accident or incident.
10. The airline should ensure continual improvement of the SMS throughout the organization by identifying and determining the implications the cause(s) of substandard performance of the SMS.
11. Enhancing "Training & Promotion" within the airline. The airline should ensures the personnel who perform functions that affect the safety or security of the aircraft operations are required to maintain competence on the basis of continued education and training to satisfy any mandatory technical competency requirements.
12. Emphasizing "Safety Communication". The airline should develop processes for the communication of safety information to personnel throughout the airline in order to provide awareness of SMS.
13. Better "Appointment of Key Safety Personnel", through designating safety personnel with appropriate qualifications, authority and independence.

14. Developing "Management of Change", as the research proofed neutrality to level of Management of Change dealing with various types of change. Airline should ensure safety risk is considered before internal or external changes are implemented.

5.1.2 Recommendations for Civil Aviation Authorities

Periodic follow-up and effective oversight for airline management in terms of SMS as actual implementation differs from the documentary implementation.

5.1.3 Recommendations for the Academic Institutions

Increasing academic researches related for aviation safety generally and safety management system particularly is highly recommended. As the study found scarcity at the related studies.

References

Bayuk, A.J. (2008). *Aviation Safety Management Systems as a template for aligning Safety with business strategy in other industries*. Retrieved April 24, 2016, from http://www.asse.org/education/businessofsafety/docs/AJBayukPaper.pdf

Civil Aviation Authority (UK) (CAA [UK]). (2002). *Safety Management Systems for Commercial Air Transport Operations*. CAP 712. Retrieved May 14, 2016, from http://acvantage.com/docs/UK_Cap712_SMS_Commercial_Air_Transport_Operations.pdf

Civil Aviation Authority (UK) (CAA [UK]). (2010). *Safety Management Systems - Guidance to Organisations*. Retrieved May 12, 2016, from http://www.caa.co.UK/docs/872/30JulySMS%20Guidance%20Materialversion3.pdf

Civil Aviation Authority Singapore (CAAS). (2008). *Safety Management Systems*. Advisory Circular 1-3(2). Civil Aviation Authority Singapore, Singapore.

Civil Aviation Safety Authority (CASA). (2008). *Regulatory Impact Statement NPRM 0803OS*. Retrieved Dec 04, 2016, from http://casa.gov.au/scripts/nc.dII-WCMS:OLDASSET::svPath=/newrules/ops/nprm/,svFileName=0803os_annex_c.pdf

Civil Aviation Safety Authority (CASA). (2009). *Safety Management Systems for Regular Public Transport Operations*. CAAP SMS-l(0). Civil Aviation Safety Authority, Canberra, ACT.

Department of Defense (DoD) Standard Practice (US). (2012). MIL-STD-882E: *System Safety*. Retrieved May 04, 2015, from, http://www.systemsafety.org/Docurnents/MIL-STD-882E.pdf

Department of Infrastructure and Transport. (2011). *Australia's State Aviation Safety Program*. Retrieved Oct 05, 2016, from

http://www.infrastructure.gov.au/aviationin/safety/ssp/files/ASASP.pdf

European Transport Safety Council (ETCS), (2009). Transport Safety Performance Indicators. Retrieved June 25, from

http://archeive.etsc.eu/documents/perfindic.pdf

International Civil Aviation Organization (ICAO). (2006a). Convention on International Civil Aviation. Retrieved May 26, 2017, from

http://portal.icao.int/icao.net/ICAO%20Documents/7300_9ed.pdf

International Civil Aviation Organization (ICAO). (2006b). *Safety Management Manual*. ICAO Doc 9859 (1st ed.). International Civil Aviation Organization, Montréal, Quebec, Canada.

International Civil Aviation Organization (ICAO). (2009). *Safety Management Manual*. ICAO Doc 9859 (2nd ed.). International Civil Aviation Organization, Montréal, Quebec, Canada.

International Civil Aviation Organization (ICAO). (2013). *Safety Management Manual*. ICAO Doc 9859 (3rd ed.). International Civil Aviation Organization, Montréal, Quebec, Canada.

International Civil Aviation Organization (ICAO). (n.d). *Forecasts of Scheduled Passenger Traffic*. Retrieved May 24, 2017, from http://www.icao.int/substainability/pages/eap_fb. aspx

New England Chapter of the System Safety Society. (2002). *System Safety: a Science and Technology Primer*. Retrieved March 25, 2016, from http://www.systemsafety.org/resources/SS_primer_4_02.pdf

Transport Canada (TC). (2012). *Safety Management System: Making Canada Safer*. Retrieved June 15, 2017, from http://www.tc.gc.ca/eng/civilaviation/standards/sms-menu-618.htm/Safety-Management-Systems-SMS-Transport-Canada

Yin, R. K. (2003). Applications of case research research. Applied social research methods series. *Thousand Oaks: Sage Publications. Yu, KH (2013). Institutionalization in the context of institutional pluralism: Politics as a generative process, Organization Studies, 34*(1), 105-131.

تطبيق نظام إدارة السلامة في شركات الطيران

مراد الوزة[١] ماجدة حسن البدري[٢] تقي محروس فهمي[٢]

[١] رئيس طاقم جوي
[٢] كلية السياحة والفنادق، جامعة مدينة السادات

الملخص العربي

إن تطبيق نظام ادارة السلامة يؤدى الى تغييرًا كبيرًا في المنظمة ويمكن أن يؤدي إلى تفادى مخاطر التشغيل. يتناول هذا البحث تطبيق نظام إدارة السلامة في الخطوط الجوية. وقد اكتمل ذلك من خلال الدراسة الاستقصائية ، المصممة كأداة رئيسية للدراسة ، ويتكون الاستقصاء من ٥ محاور تم وضعها وفقًا لإطار عمل نظام إدارة السلامة الصادر من منظمة الطيران المدني الدولي .(ICAO) إن عينة البحث شاملة لجميع الموظفين على مستويات إدارية مختلفة في شركة تم اختيارها كدراسة حالة، حيث يخضع الجميع لتدريب نظام إدارة السلامة الأساسي والدوري. وقد أثبت البحث قصوراً في عملية تطبيق نظام إدارة السلامة في أبعاد عديدة وقد طور البحث بعض التوصيات التى من شأنها تحسين تطبيق النظام.

الكلمات الدالة: نظام، إدارة السلامة، شركات الطيران.