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# RISK MANAGEMENT IN THE AVIATION SECTOR CASE STUDY: BEIRUT RAFIC HARIRI INTERNATIONAL AIRPORT

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**ABSTRACT** **This article discusses the topic of risk management in the civil aviation sector with a case study that concerns the BRHIA airport in Beirut. It consists of two parts, the first is theoretical and is a bibliographic review of various research that fall under the topic of risk management and different definitions and strategies of crisis management, as well as the various gaps that weaken this field. The second part is the case study with all the steps necessary for its conduction, such as the definition of the study's methodology, the choice of the sample, the variables of the study and the tools needed, and the questionnaire. 195 persons among the staff of BRHIA's Directorate General of Civil Aviation completed the questionnaire. The SPSS analysis of the results of the questionnaire shows that about 36.9% of the respondents were men and (66.7%) were women and most of the respondents belonged to the age group between 45 and 55 years of age. SPSS results show that crisis management, professional experience and all their components exert a strong influence on crisis management at the General Directorate of Civil Aviation in Lebanon whereas the conflict of power and the political interference and all their components as well as the organization's performance, coordination, control, auditing and all of its components exert a negative influence on crisis management at the General Directorate of Civil Aviation in Lebanon. this study with its theoretical and practical parts including the qualitative and the quantitative part allow us to study the different dimensions of the crisis which are related to the variables selected from the questionnaire and classified into 8 categories of labels: 1-Perception of the nature of crisis, 2 Coordination and Cooperation, 3-Training, 4-Power Conflict, 5-Political Intervention, 6-Practice of Control and Audit, 7-Organizational Performance, 8-Crisis Management and Professional Experiences.**

**KEYWORDS** :BRHIA, normal incident, BCM, crisis managment, response, Beirut, SPSS.

## INTRODUCTION

The study of the safety of an air terminal requires a deep understanding and a perfect mastery of its various parts to prevent the malicious, sometimes arranged, attitude of the terrorists.

**Airport Continuity Management Studies**

Although BCM business continuity management is an emerging practice, there is little evidence in the existing literature of the widespread application of this process in the aviation industry.

Wesensten, N.J., (2014) reviewed the Business Continuity Plan used by the Australian Customs Service, which aimed at maintaining urgent clearance in the event of total or partial loss of critical computer systems. [Dhaevers et al., 2016] examined how continuity approaches can improve logistics flows at airports, and NASA (2016) used the example of Air New Zealand to show how BCM can help ensure the survival of an airline company.

**The airport flow**

The person or the dangerous body necessarily take the way of the flows of people and goods carried out at the airport. A flow is defined as moving people or objects along a well-defined path to move from one point to another. A wide variety of flows exist at the airport: flows of passengers, personnel, vehicles, aircraft, luggage, service and others. These flows are able to interact with each other or not Paté-Cornell, M (2016).

The generally accepted rules for flow management are:

- no flow mixing at the start;

- no mixing of flows on arrival (a tolerance applies if both flights have the same regime);

- no flow crossing;

- existence of alternative routes in case of degraded situation;

- reduction of distances to be covered;

- signaling corresponding to these rules.

To all the above is added a set of characteristics, previously advanced in various definitions of the literature and summarized in Table 1.

| Author | Key Points of définitions | To remember |
|---|---|---|
| Thornton (2008) | | business continuity plan of the Australian Customs Service. maintain urgent customs clearance in case of total or partial loss of essential computer systems. |
| Skelton (2007) | | how continuity approaches can improve logistics flows at airports |

**Table 1:Summary of characteristics identified in the definitionsapitulatif des caractéristiques relevées dans les définitions**

***Summary***

*The existing literature contains little evidence of the widespread application of the business continuity management process in the aviation industry. Airport-wide BCM studies have focused on the large-scale benefits of continuity in the protection of critical infrastructures of national importance. The goal of ensuring continuity at airports is of a safe nature, Van den Top, J. (2010)*

*A flow in the airport is defined as a movement of people or objects along a well-defined path from one point to another. The general safety rules require constraints concerning the non-mixing of certain flows Technica (2018).*

**The dashboard design**

**Circulation of airport staff, airlines and service companies**

In order to avoid any interference by a dangerous person disguised as an airport staff member, airline or service company, all airport employees are required to have a security badge during the day when they are in a security restricted area. The possession of a security badge does not give access to the entire reserved area of the airport.

For example reserved area of the airport in France is divided into four geographical areas:

**A (plane):** In zone A, close to the plane, all the staff in charge of taking care of the aircraft during its stopover (refuelers, baggage handlers, etc.) can circulate;

**B (luggage):** This zone constitutes the baggage galleries; baggage handlers, security operators can pass through;

**F (freight):** This zone is intended for freight activities;

**P (passengers):** Zone P is the areas of the passenger terminal where passengers are traveling.

## Circuit for passengers and hand luggage

Different steps determine the way of passengers in the airport. The necessary steps depend on the passenger and their arrangement depends on the composition of the terminal. Sterman, J. D. (2010) . However in this study a simplified circuit is examined, using the steps and controls common to all airports Shaw, L. S(2011).

A simplified diagram of the starting and ending circuits is shown in the figure below.

On this diagram are the main controls imposed on passengers and baggage to ensure security in the terminal and on the aircraft.

**Figure 1: Organizational scheme of the passenger terminal**

**Figure 2: The modalities of actions in case of crisis**

**Summary**

*In order to avoid any interference by a dangerous person at the airport, airlines and all airport employees are required to have a security badge when they are in a restricted area security restricted area. The possession of a security badge does not give access to the entire reserved area of the airport.*

**Identification of gaps**

## A-gap 1 : existing BCM as a practitioner discipline

BCM Business Continuity Management is a process that has developed from practical solutions in response to the problem of crisis management and lower level disruption Kendall, M. (2012).

Although many important authors Kennedy, R (2018) have published numerous publications on this process, they are largely focused on the detail of the components of the BCM, or their applications, in different sectors or organizations. There is still no strong link between the discipline of BCM practitioners and the existing theory.

A review of the literature that identifies a number of theoretical approaches helps to understand concepts related to crisis and disturbance management.

## B- gap 2 : Lack of resources to achieve high reliability

High reliability has been well established by empirical research. The explanation of practices that can be used by organizations to become very reliable is insufficient. This is an area in which a more empirical base is needed in order to establish business strategies to achieve high reliability. This issue is further complicated since many of the organizations involved were military or quasi-military, maintaining a strict hierarchical structure and a consistent respect for the procedure and rules Isaac, A (2012).

It is possible that the underlying structural difference between military and civilian organizations alters the way in which high reliability principles can be applied. It is therefore an essential area of distinction that requires further empirical research IATA (2017). This includes both the identification of practical strategies that can be achieved by human resources and their applicability to civil organizations.

## Summary

*Business continuity management is a process that has developed from practical empirical solutions. High reliability has been well established by empirical research mainly based on observations of civilian or military organizations that have reached high levels of reliability. As this is an essential area of distinction, it requires more in-depth empirical research.*

**Propensity to failure**

In order to understand the nature of organizational failure, key theories about organizational failure need to be considered as the concept of a normal accident.

## A-The concept of normal accident

The genesis of the concept of a normal accident arises from the occurrence of a series of highly influential accidents in complex socio-technical systems, where the specialists have tried to better understand how they occurred. The concept of Kendall's normal accident, emerged from this quest for understanding Kendall, M. (2012). The concept of a normal accident, basically, bases its analytical objective on two key parameters: interactive complexity and tight / loose coupling, related to the opposite components of any organization, control system or complex institution Pinder, C. C. (2018).

This results in complex and unwanted interactions between the two preexisting conditions (vulnerabilities), and unusual or unexpected interaction between the system components leading to conditions in which the security and / or control systems are disabled, the role of interactive complexity and tight / loose coupling (weak / strong) that Perrow associates with "normal accidents".

## B- Complexity coupling relationship

The relationship between complexity and coupling, as well as the impact on system vulnerability, can be illustrated in more detail using the classic Kurowicka, D diagram, which presents the four quadrants of the concept of a normal accident. It is noted that even though aircraft and airways remain relatively complex and tightly coupled, accidents will continue to occur, particularly when humans are pushing these systems to higher operating levels.

Figure 18 shows that aircraft and the wider aeronautical industry (airways) have a tight coupling, and identify airports as being a system that is both closely coupled and interactive.

When applied to organizations, the combination of complexity and tight coupling provides an interesting insight into the causal sequence of failures that can quickly degenerate into the system before understanding and recovery is possible. Mosleh, A., (2012).

These events are normal accidents such as failures resulting from interactions between components of a technical system that are not anticipated because of the very large number of potential interactions in complex systems "Meyer, J. (2011).

**Figure 3: Complexity Coupling Relationship Kurowicka, D.**

**(2014)**

While accidents can be expected in large and complex organizations, the means by which relatively minor disturbance impacts can degenerate into a system to create major failures is an important aspect of post-conflict analyzes. incident.

LOSA Collaborative seeks to explain this phenomenon by dividing complex systems into four distinct levels, consisting of a part, a unit, a subsystem and a system.

A simple way is to look at these different levels in the context of a nuclear reactor. LOSA Collaborative (2017). Locke, E. A. (2017).

## summary

*The genesis of the concept of a normal accident stems from the occurrence of a series of highly influential accidents in complex sociotechnical systems. The concept bases its analytical goal on two key parameters: tight / loose coupling and interactive complexity.*
*The complexity of the interactions is closely related to the coupling of processes and the relevant systems of the concept of normal accident are presumed to contain complex interactions and tight coupling of components within the system. The combination of complexity and tight coupling in organizations allows an examination of the causal sequence of failures that can escalate rapidly into the system long before the problem is captured and the situation corrected.*

**Aviation as a complex hierarchical system**

Rasmussen (2017) used several levels to describe the complexity of a socio-technical system involved in security control, as shown in Figure 4.

At the top, society controls security through the legal system and sets rules. . Each company must interpret and implement these rules by defining its objectives, choosing appropriate risk control measures and deploying resources.

**Figure 4: The sociotechnical system involved in risk management (Rasmussen, 2017)**

Within the company, management must put in place effective, appropriate and sufficient risk control measures that operate throughout their life cycle.

People at the lowest level of the safety performance chain must perform a series of actions in order to keep the work process within operational limits and safety limits to prevent any event of failure before the accident Reddy, A.V ( 2014).

Each stakeholder has a system across hierarchical levels ranging from government to individual work processes in security control. Global security depends not only on each individual responsibility and contribution to security, but also on the correlation between these systems and their integration into a comprehensive global security management system and security culture [Ben Mena, 2010] .

**summary**

*Rasmussen (2017) used several levels to describe the complexity of a socio-technical system involved in security control. Each stakeholder has a system across hierarchical levels ranging from government to individual work processes in security control [Bouyssou et al., 2016]. Global security depends on individual responsibility, the contribution to security, the correlation between these systems and their integration into a safety management system [Caillé, 2013].*

## Conclusion of the theoretical part

In the opinion of the researchers, the phases of a crisis are different, but most of them have points in common. According to all the studies, these crises consist of a prolonged or short ascending phase (short in case of sudden crises) depending on the type of crisis. Then the crisis reaches its peak symbolizing its point of maximum intensity and stagnates sometimes.

Finally, comes a downward phase of more or less steep slope depending on the type of crisis and the effectiveness of the established management plan. In all cases, precrisis and post-crisis concepts are present. In this theoretical part, a bibliographic study on crisis management is carried out in order to understand the various aspects relating to a crisis and the different phases of crisis management actions, especially the crisis response phase and its emergency subphase.

This review of the literature defines a number of theoretical approaches to capture concepts related to crisis and disruption management such as the concept of normal accident, crisis management and risk management that help to understand the problem. but do not fully explain the phenomenon.

In terms of business continuity management, this research adopts Elliott's definition. The study of aviation safety requires a deep understanding of these various definitions concepts and processes to prevent the intrusion of terrorists. However, these concepts and processes are developed in the theory and there is still no consistent relationship between the discipline of practitioners and the existing theory.

**Methodology and variables of the study:**

There are many variables affecting the performance of crisis management in the civil aviation sector. The researcher presents a description of the methodology used in the study, as well as the monitoring of study boundaries, the identification of the study population, the reasons for choosing the sample and the characteristics of the sample members in terms of their demographic

characteristics. He then reviews the structure of the study used to collect the necessary data and information and the procedures it has followed to ensure its veracity and structural clarity, as well as to ensure its stability. he also describes the procedures that he used in the legalization of the tools of the study and its application, and finally shows how to apply the study and the statistical methods used in the analysis of the data of the study.

**Methodology of the study:**
In this study, the researcher used the descriptive analytical method, which is defined as "a method that relies on the collection of information and data on a phenomenon, event, thing or reality in order to identify the phenomenon under study, to determine its current situation and to identify its strengths and weaknesses in order to decide on the validity of this situation or the need to make partial or fundamental modifications.Thus, an analytical descriptive approach can be applied to know the following elements:

1. To know some detailed facts on the studied phenomenon, which makes it possible to diagnose this reality.
2. Identify problems or provide evidence to demonstrate actual behaviors and current situations.
3. the analysis of specific experiences in order to benefit from them in making decisions on similar issues.

Thanks to the analytical descriptive approach, the impact of crisis management performance on crisis management by the General Directorate of Civil Aviation in Lebanon will be identified.

**Overview of the General Directorate of Civil Aviation in Lebanon**
The General Directorate of Civil Aviation is one of the directorates of the Ministry of Public Works and Transport, whose work is governed by Regulatory Decree No. 1610 of 26/7/1971.

The General Directorate of Civil Aviation, which includes in its structure the management of the airports and the technical investment department, and nine technical and administrative departments, as well as the presidency of the airport and Diwan, seeks to organize and to operate the Rafic Hariri International Airport, Lebanon's gateway to the world.

This division brings together the best administrative staff and technical experts in air navigation control, aviation safety and air transport, equipment maintenance, facilities, aerial surveillance and communications. It also brings together the best engineers for the preparation of studies, research and rehabilitation and development projects in addition to a team working in the field of health and fire, which strives to improve investments in the aviation sector in accordance with scientific and technological development, on the one hand, and respecting the rules, laws and standards imposed by international conventions and treaties in the field of aviation and its security, on the other hand.

The General Directorate of Civil Aviation has been coordinating with the International Civil Aviation Organization (ICAO), with various agencies and administrations of civil aviation and foreign airports in order to contribute to the development of the civil aviation sector and aspires to be one of the important facets of Lebanon.

**The variables of the study**
The variables of the study were divided into two main parts:

The independent variables: these are the variables that make a certain change in the actuality and the observation of the results and the effects of this change on the dependent variable.

These independent variables include:

1. Crisis Management Performance: This includes the following:

- Nature of the crisis, coordination and cooperation, training, power conflicts, political intervention, monitoring and audit, organizational performance, crisis management and professional experience.

2. Demographic characteristics: which include gender, age, administrative level, academic qualifications and years of experience.

- The dependent variable: includes crisis management.

**Study tool**
This part covers the following aspects :

**1.Steps to create the study** tool: The researcher used a questionnaire to collect data and information about the study. The questionnaire is one of the most commonly used scientific research tools in analytical descriptive research and is defined as a systematic survey tool consisting of a set of systematic steps, starting with identifying the required data and ending with receiving and organizing forms in a way that saves time, effort and expense.

The researcher reviews the most important steps in the construction of the study tool to identify the impact of crisis management performance on crisis management by the General Directorate of Civil Aviation at Lebanon.

**2.The purpose of the study tool:**
The objective of the study tool is:

Identify the impact of the performance of crisis variables on crisis management.

Identify the differences between the average responses of the study population according to study variables (age, gender, administrative level, academic qualifications, years of experience).

**3. Formulation of the paragraphs of the study tool:**
The formulation of the paragraphs of the study tool was as follows:

- Review the theoretical literature on the performance of crisis management and the analysis of variables.
- Review of measures from previous studies used to identify the effect of variables on crisis management.
- Review of previous studies and related topics to identify the terms of each axis of the study tool and the formulation of its paragraphs.

The sections of the study instrument were formulated on the basis of the following elements:

- Taking into account that these paragraphs serve the objectives to be achieved and that make it possible to achieve the objectives of the study.
- The sections of the study tool have been formulated in a way that is clear, understandable and appropriate for all employees of the General Directorate of Civil Aviation in Lebanon.
- Diversity was taken into account in the selection of paragraphs of the study instrument, so that each paragraph

had a specific objective that measured a specific area in each axis of the study instrument.

**Population of the study:**
The study population includes a sample of the staff of the General Directorate of Civil Aviation in Lebanon, located in Beirut.

The questionnaires have been distributed to most branches of the branch in Table (2) and to a number of employees of Directorates, Boards, Chambers, Divisions and Offices of the General Director, who constitute the General Directorate of Civil Aviation in Lebanon. The study population was determined from these levels for their experience and qualification to answer the questions in the study. The study sample consists of (195) employees spread over most of the institution's directorates. After the questionnaire was distributed to the employees concerned, the researcher retrieved (186) and excluded (6) questionnaires for non-compliance with the requirements of scientific research (such as not responding to general information or giving two answers to the same question which makes it difficult for the researcher to choose the appropriate answer). Therefore, the percentage of accepted questionnaires is (93%), which is a high percentage and valid for performing analysis and access to results related to the phenomenon of the subject of the study.

| Number | Administrative unit | Nombre de travailleurs | Pourcentage de travailleurs % |
|---|---|---|---|
| 1 | Branch of the Director General's Office | 97 | 80 |
| 2 | Customs | 10 | 6 |
| 3 | IT and Communications Branch | 15 | 14 |
| 4 | Air Operations Branch | 23 | 1 |
| 5 | Air Operations Branch | 42 | 30 |
| 6 | Device maintenance | 75 | 30 |
| 7 | Air Transport | 5 | 5 |
| 8 | Air safety | 4 | 4 |
| 9 | Crime Branch | 2 | 2 |
| 10 | airport | 2 | 1 |
| | Total | 275 | 189 |

**Table 2 : study population.**

*Source : préparé par le chercheur*

## ANALYSIS: Characteristics of the study sample:

The study sample can be categorized into five groups (age, gender, administrative level, academic qualification, years of experience). Below a description of the characteristics of the elements of the sample will be made in light of these demographic characteristics:

## 1-Gender :

The statistical analysis in the sample of the study showed that about 36.9% of the respondents were men and (66.7%) were women, as shown in Table (3).

| Variables | Frequency | Percentage | Mean | Standard Deviation | Mode |
|---|---|---|---|---|---|
| men | 169 | 89.4% | 1.6308 | 0.484 | 2.00 |
| women | 20 | 10.5% | | | |
| Total | 189 | 100 % | | | |

***Table 3: Distribution of study members by gender variable.***

*Source: Prepared by the researcher from Statistical Analysis Results (SPSS)*
From the previous table, it is clear that 89.4% of the BRHIA sample in the study are men and 10.5% are women, indicating that the majority of the sample studied in the institution is men gender.

## 2- Age :

The statistical analysis of age in the study sample showed that 5.4% of the total respondents belonged to the age group of people under 25 years, while 18.5% of the respondents belonged to the age group from 25 to 35 years.

The third age group, which includes individuals aged between 35 to 45, was 24.6%. The highest percentage belongs to the group of people aged between 45 and 55 years. Finally, the age group of individuals aged 55 and over represented 10.8%, as shown in the table (4).

| variables | Frequency | Percentage | Mean | standard Deviation | Mode |
|---|---|---|---|---|---|
| Less than 25 years | 17 | 8.9% | 3.3308 | 1.06668 | 4.00 |
| from 25 to 35 | 44 | 23.2% | | | |
| from 35 to 45 | 52 | 27.5% | | | |
| From 45 to 55 | 62 | 32.8% | | | |
| Greater than 55 ans | 14 | 7.4% | | | |
| Total | 189 | 100% | | | |

***Table 4: Distribution of people in the study by age variable.***

*Source: prepared by the researcher based on SPSS analysis results*
The table above shows that about 53% of the sample in the study belong to the age group over 45 years, which is about half of the sample surveyed by the Lebanese airline MEA.

**Statistical analysis of the study hypotheses**

| variables | Pearson Corrélation | Sig. (1-tailed) | Taille de l'échantillon |
|---|---|---|---|
| Crisis management and professional experience | .483** | .000 | 189 |
| Power conflict and political interference | -.133 | .066 | 189 |
| crisis management performance | -.084 | .172 | 189 |

***Table 5: correlation coefficient between crisis management in the General Directorate of Civil Aviation in Lebanon with each of the aspects studied.***

**There is no statistically significant relationship of the crisis management model and professional experience on crisis**

**management.**

A correlation coefficient has been established to determine the impact of crisis management and professional experience on crisis management within the General Directorate of Civil Aviation in Lebanon. Table (5) shows that the correlation coefficient is (0.483) and the significance value is (0.000), less than (0.05). This means that there is a strong positive correlation between crisis management and professional experience on the one hand and crisis management on the other hand at the 0.05 significance level.

This means that crisis management, professional experience and all their components exert a strong influence on crisis management at the General Directorate of Civil Aviation in Lebanon.

**There is no statistically significant relationship between the model of power conflict and political interference on crisis management.**

A correlation coefficient has been established to determine the impact of crisis management and power conflict and political interference on crisis management at the Directorate General of Civil Aviation in Lebanon. Table (5) shows that the correlation coefficient is (-0.133) and the significance value is (0.172), greater than (0.05). This means that there is a negative correlation between power conflict and political interference on the one hand and crisis management on the other hand at a significance level (0.05).

This means that the conflict of power and the political interference as well as all that composes them have a negative influence on the crisis management at the General Directorate of Civil Aviation in Lebanon.

**There is no statistically significant relationship of the organizational performance model, coordination, control and audit to crisis management.**

A correlation coefficient has been established to determine the impact of organizational performance, coordination, control and audit on crisis management at the General Directorate of Civil Aviation in Lebanon. Table (22) shows that the correlation coefficient is (-0.084) and the significance value is (0.066), greater than (0.05). This means that there is a negative correlation between power organizational performance, coordination, control and audit on the one hand and crisis management on the other hand at a significance level (0.05). This means that the organization's performance, coordination, control, auditing and all of its components exert a negative influence on crisis management at the General Directorate of Civil Aviation in Lebanon.

**Discussion**

**Types of Crisis in the BRHIA Civil Aviation Department**

The results obtained in the two theoretical and practical parts including the qualitative study and the quantitative study allow us to study the different dimensions of the crisis within the civil aviation department of the BRHIA, taking as a reference the model proposed by Roux Dufort.

The types of crises likely to confront BRHIA's civil aviation department are diverse and can be grouped into political crises, technical crises, information crises, strategic or economic crises, legal crises, ethical crises and finally human or social crises.

These crises can be related to the variables or themes selected from the interviews of the qualitative study which are the same as the variables of the quantitative study and classified into 8 categories of labels to recall: 1-Perception of the nature of crisis, 2- Coordination and Cooperation, 3-Training, 4-Power Conflict, 5-Political Intervention, 6-Practice of Control and Audit, 7-Organizational Performance, 8-Crisis Management and Professional Experiences.

**Figure 5: crises types**

**Economic dimension of the crisis:** Lebanon suffers from a crisis in its economic sector that has economic repercussions on BRHIA's civil aviation department.

**Ethical dimension of the crisis:** in Lebanon recruitment must be done taking into account the sectarian diversity of the population to keep the balance in the distribution on. We propose in this dimension to analyze the social acceptability of the crisis.

**Legal dimension of the crisis:** BRHIA's civil aviation department also has a legal dimension in part because of judicial protection. This dimension can be linked to the axis of the conflict of power and the axis of political intervention

**Technical dimension of the crisis:** is a crisis that requires major structural changes in the civil aviation department of BRHIA in connection with the technical dimension of the crisis. This dimension can be linked to the axis of coordination and cooperation, the axis of training and the axis of organizational performance.

**Informational dimension of the crisis**: which is related to the importance of information in crisis management in the civil aviation department of BRHIA. This dimension can be linked to the axis of coordination and cooperation.

**Human and Social Dimension of the Crisis** in BRHIA's Civil Aviation Department.The human and social dimension concerns all the interactions between the organization and the staff or the organization and the machines. This dimension can be linked to the Perception of the nature of crisis axis, the control and audit practice axis, the organizational performance axis and the crisis management and professional experiences axis.

**Political dimension of the crisis:** This dimension can be linked to the axis of the conflict of power and the axis of political intervention.

## CONCLUSION

The proper diagnosis of crises in BRHIA's civil aviation department is key to dealing with crises. A correct diagnosis is based on knowledge, practice, experience, perception and, above all, on the abundance of information available to decision-makers or the people responsible for diagnosing the crisis.

Therefore, the task of a thorough diagnosis is not only to know the causes and motivations of the emergence of the crisis and the factors that have helped them, but the need to determine how to resolve the crisis, when and where , who is in charge of managing it, and what the operation of crisis management requires as information, communications and support tools.

Crisis management by the civil aviation department of BRHIA in Lebanon requires a complete awareness of all that can confront the decision maker in this department in the light of the existence of several administrative constitutions and governance that dictate the manner of behaving, and which are

generally known by the nine commandments.

**Principle 1: the goal**
Two conflicting objectives are still present in crisis management in BRHIA's civil aviation department:

- The objective of the crisis-triggering forces that seek to achieve it.
- The objective of the head of crisis management in order to fight against the crisis, a goal that is often vague for the decision maker. Thus, the determination of the crisis is based on the attack of the crisis at the right time, when the wall of the crisis is more vulnerable to impacts.

## Recommandations :

This study has highlighted multiple accident causalities within the general direction of civil aviation in the BRHIA, which can be considered a crisis if they are not resolved. In addition it highlighted through the eight variables obtained during the qualitative and quantitative study, many points to develop, improve or implement within the general directorate of civil aviation BRHIA. Therefore, the following recommendations are proposed to the regulatory authority in the general directorate of civil aviation of BRHIA, to practitioners and academics.

**Regulatory authority in the General Directorate of Civil Aviation of BRHIA**
Specific recommendations to the regulatory authority include:

(1) improving the quality of human resources within the regulatory authority, particularly the Ministry of Transport;

(2) review the existing aviation regulations;

(3) strengthen the enforcement of air transport regulations;

(4) improvement of development planning in the air transport system.

Each recommendation is detailed below:

**1-the quality of human resources**
First, the quality of human resources in the general directorate of civil aviation of BRHIA can be achieved by:

a) providing officers with continuous training and workshops;

(b) reviewing and revising the bureaucratic system, placing the right person in the right position;

(c) ensuring adequate salaries for staff, in particular those who perform the duties of inspector and who are responsible for licensing;

(d) establishing a safety culture within the regulatory authority within the general directorate of civil aviation of BRHIA

**2- Problem management:**
Problem management in in the general directorate of civil aviation of BRHIA depends on the:

- examination of the surrounding environment to identify general trends that may affect it in the near future.

- the collection and evaluation of data on potentially questionable problems.

- the development of a communication strategy and the concentration of efforts on the prevention or reorientation of any crisis.

**ref_str**


1. **Wesensten, N. J., Belenky, G., Thorne, D. R., Kautz, M. A. and Balkin, T. J. (2014).** "Modafinil versus caffeine: Effects on fatigue during sleep deprivation." Aviat Space Environ Med 75: 520-525.
2. **Dhaevers V., Duvivier D., Meskens N. et Riane F.,** « Aide multicritère au pilotage des systèmes productifs », ROADEF'06, Lille, 2016.
3. **NASA (2016).** Report of the Presidential Commission on the Space Shuttle Challenger Accident. National aeronautics and space administration, Washington, D.C.
4. **Paté-Cornell, M. E. and Murphy, D. M. (2016).** "Human and management factors in probabilistic risk analysis: The SAM approach and observations from recent applications." Reliability Engineering and System Safety 53(2): 115-126.
5. **Van den Top, J. (2010).** Modelling Risk Control Measures in Railways: Analysing how designers and operators organise safe rail traffic. PhD. thesis, Delft University of Technology.
6. **Technica (2018).** The Manager Technique. Management Safety Systems AssessmentGuidelines in the Evaluation of Risk. London.
7. **Sterman, J. D. (2010).** Business Dynamics: Systems thinking and modeling for a complex world, Graw Hill.
8. **Shaw, L. S. and Sichel, H. S. (2011).** Accident proneness: Research in the occurrence, causation, and prevention of road accidents, Pergamon.
9. **Kendall, M. (2012).** Rank correlation methods, London: Charles Griffin & Co. Ltd.
10. **Kennedy, R. and Kirwan, B. (2018).** "Development of a Hazard and Operability-based method for identifying safety management vulnerabilities in high risk systems." SAFETY SCIENCE 30(3): 249-274.
11. **Isaac, A., Shorrock, S. T. and Kirwan, B. (2012).** "Human error in European air traffic management: the HERA project." Reliability Engineering and System Safety 75(2):257-272.
12. **IATA (2017).** IOSA Standards Manual Ed 2, International Air Transport Association.
13. **Kendall, M. (2012).** Rank correlation methods, London: Charles Griffin & Co. Ltd.
14. **Pinder, C. C. (2018).** Motivation in work organizations, Upper Saddle River, NJ: Prentice Hall.
15. **Mosleh, A., Goldfeiz, E. and Shen, S. (2012).** The ω-factor approach for modeling the influence of organizational factors in robabilistic safety assessment. IEEE six annual human factors meeting. Orlando, FL , USA.
16. **Meyer, J. P. and Herscovitch, L. (2011).** "Commitment in the workplace: Toward a general model." Human Resource Management Review 11: 299-326.
17. **LOSA Collaborative (2017).** Threat and Error Code Book. Austin, Texas.
18. **Locke, E. A. (2017).** The motivation to work: What we know. In M. L. Maehr & P. R. Pintrich (Eds.), Advances in motivation and achievement (Vol. 10, pp. 375-412), Greenwich, CT: JAI Press.
19. **Rasmussen, J. (2017).** "Risk management in a dynamic society: A modelling problem." Safety Science 27: 183-213.

20. **Reddy, A. V. (2014).** Investigation of aeronautical and engineering component failures, CRC Press.
21. **Ben Mena, S.,** « Introduction aux méthodes multicritères d'aide à la décision », Biotechnol. Agron. Soc. Environ.,2010.
22. **Bouyssou D., Dubois D., Pirlot M., Prade H.,** « Concepts et méthodes pour l'aide à la décision 3 », 2016.
23. **Caillé R.,** « Analyse multicritère : étude et comparaison des méthodes existantes en vue d'une application en analyse de cycle de vie », CIRANO, 2013.


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