

AIRCRAFT ACCIDENT INVESTIGATION SYSTEM IN AVIATION INDUSTRY DURING AIR TRANSPORTATION

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ABSTARCT

The research starts with discussing the aircraft accident investigation which is defined as a process conducted for the purpose of accident prevention and focused on the circumstances of the accident including gathering, recording and analysing all of the available information, the drawing of conclusions, and the determination of accident causes . Despite the attitude and commitment to achieving the above purpose, accident investigations may become a cumbersome task associated with significant costs and uncertainty. This can potentially contribute to some accidents being assigned an unknown cause as seen in global aircraft accident statistics for the past 50 years. Thus, the investigation process has been subjected to constant review in order to improve its outcomes and to help enhance air traffic safety. This research work aims to contribute to this constant review process by examining possible methods of improving the efficiency of aircraft accident investigation. As a result, initially the question of how to comprehensively consider the complex investigation procedure was raised. The work concludes that an intuitive and interdisciplinary approach must be vital elements of any contemporary method used for establishing a set of priorities for further improvement of aircraft accident investigation. Hence, the interpolations methods, including an analysis of accident statistics and Delphi enquiry, are appropriate tools in analysing and drawing conclusions for further improving the investigation. The statistical data examined contained the number of accidents which occurred between 1950 and 2004 worldwide including accident distribution over the past, causal factors, and casualty count. The importance of statistics as a research tool has long been appreciated by ICAO (International Civil Aviation Organization) which sees accidents statistics as a tool for ‘understanding the past, explaining the present and planning for the future.

1 .INTRODUCTION

One of the biggest achievements of mankind has been the rapid growth in the aerospace industry in particular air traffic. At the beginning of the twenty first century airlines operate more than 22 million passenger flights annually worldwide, transporting over one billion passengers globally. Consequently, air traffic has become the prevalent means for carrying passengers and transporting goods over long distances, far exceeding marine and road traffic.² Aircraft frequently cross great oceans, vast featureless deserts, immense ice wastelands, and enormous desolate regions in complete safety in spite of the adverse conditions of the terrain below. Despite the huge progress in air traffic safety, human errors, equipment malfunctions as well as unusual events occur and therefore accidents still do take place . Air accidents are relatively rare, but when they do happen they are devastating. In the past 50 years, over 1600 accidents have occurred worldwide resulting in more than 64,000 deaths indicating that air traffic is still imperfect Determining personal errors or responsibilities are thus not included in the duties of aircraft accident investigators. Yet it is inevitable that in the course of an investigation, any omissions or errors made by individuals or organizations will be revealed. Simply investigators determine what happened, how it happened and why it happened. During this procedure, investigators seek out evidence analyse suspicious equipment, draw conclusions and where appropriate issue recommendations. The main cause of an accident is occasionally ambiguous.

For instance, the failure of a system can result from poor control or maintenance. Similarly, if a human error appears

as an accident cause then it is investigated from all aspects relevant to the procedure. Moreover, the investigation does not finish when a failure is deduced or detected, but rather it strives to find out why this failure occurred. Within this capacity, experience shows that poor design, human error, inconsistency or poor procedure may significantly distract or confuse the crew and other personnel. However, statistics indicate that most aircraft accidents occur due to human error, or circumstances that lead to human error, including deficient design, manufacturing, testing, maintenance, control and/or operation. Identification of these elements can occasionally be very difficult, but can still be discovered by careful, comprehensive and persistent examination. Sometimes accidents can result from an organisational deficiency such as a lack of training or poor management. For instance, the aircraft owner could have issued procedures or instructions that do not meet all aspects of air traffic safety.

2. OBJECTIVE

The major objective of an aircraft accident investigation is to determine the causes of an accident help establish consistent measures to avoid similar occurrences under related circumstances. To accomplish this objective, all circumstances and details within an aircraft accident are examined, documented and correlated. In most occurrences there is a chain of factors that combine to form the causes of the accident/incident. Within an investigation all aspects of the accident are equally important, including determining the cause of the accident, the circumstances relating to the survivability of passengers and damage to the aircraft, as well as issuing recommendations. However, the sole objective of the investigation of an accident or incident is to help prevent future reoccurrences or, in other words, is not the purpose of the accident investigation to apportion blame and liabilities.

ACCIDENT INCIDENT INVESTIGATION REPORT

Aircraft accident and serious incident, the progress and result of the investigation is to be published including any safety recommendation via the release of a Preliminary Report and a Final Report. The purpose of the preliminary report is to communicate promptly the data obtained during the early stages of the investigation. The Preliminary and the Final reports along with any safety recommendations are sent to the relevant parties to the investigation, States and organisations. Requirements and guidance regarding the notification of accidents are provided in Annex 13.

In practice, not all State Investigation Agencies automatically issue Preliminary Reports but many do issue Interim Reports if significant matters which it is judged deserve prompt disclosure, come to light during a major investigation.

DATA COLLECTION

The goal for all data collection is to capture quality evidence that then translates to rich data analysis and allows the building of a convincing and credible research to questions that have been posed.

Through data collection and analysis, they can streamline maintenance, improve safety, and cut costs. Furthermore, big data can help airlines industry to have a better understanding of the aircraft accident reason. They can investigate each individual's accident and incident, track their causes, and project future demands.

PRIMARY DATA

Primary data was collected from various website and their browsers and information for the specific purposes of study helped to run the analysis of accident. In essence, the questions asked were tailored to elicit the data that will help for study. The data was collected through questionnaire to understand their experience expert and preference towards their loyal investigatotr .

Secondary Data

To make primary data collection more specific, secondary data will help to make it more useful. It helps to improve the understanding of the investigation. Secondary data was collected from various sources such as different accident investigation report and published papers.

DRAWBACKS

There was so much confidential data of accident investigation that are not exposed. Research was restricted to particular aircraft incident because respondents willing to fill are college students. Analysis and research was done based upon personal or group research of respondents group, not from any focus experts team

LITERATURE REVIEW AND THEORITICAL FRAMEWORK OF AIRCRASH ACCIDENT INVESTIGATION

This research provides a summary of some of the current research and literature relevant to this work. In particular research techniques and methods used by aircraft accident investigators are examined as well as fields where their application and contribution to an investigation is the most effective.

However, the ICAO and national investigating agencies such as ATSB, NTSB, and AAIR produce most of the research studies relevant to aircraft accident and incident investigation issues. Most of this information is available online so that keeping up to date with investigation news is significantly easier than it once was. Since aircraft accident investigation covers a variety of topics the articles discussed are categorised into the following sections:

Most wanted improvements in aviation issued by the NTSB

References having the greatest impact on this research Articles using statistics as a research tool

Articles devoted to analysing human, aircraft and weather induced causal factors. These articles create a concise picture about the current level of knowledge on aircraft accident investigation and have provided some conclusions that have had a significant impact on proceeding with this research

This research paper frame the theoretical knowledge of

INVESTIGATION

RESPONSIBILITY OF ORGANISING IN CONDUCTING THE INVESTIGATION

DEMONSTRATING OF ACCIDENT INVESTIGATION THROUGH EXPER INTERNATIONAL STANDARD TO AIRCRAFT ACCIDENT IN INCIDENT INVESTIGATION ACCIDENT SCENERIO RECORDING AND COLLECTING EVIDENCE

AIRCRAFT SYSTEM EXAMINATION

ATC RADAR

HUMAN FACTOR EXAMINATION

AIRCRAFT ACCIDENT DURING PERIOD 1950-2004

OVERCOME FROM ACCIDENT INVESTIGATION DURING AIR TRANSPORTATION

Those above theoretical content provide us a brief idea about this research paper

AVIATION INDUSTRY

The aviation industry encapsulates the development, operation and management of aircrafts. While the common perception about the sector is that it's only about pilots and airhostesses, there are numerous other, equally significant job options that the industry cannot function without; from in-flight trainers and aircraft maintenance engineers to baggage handlers and reservations agents. Performance .The economic slowdown which began in 2008 hit the global aviation industry severely with many airlines such as United and British Airways in the red. This was due to falling passenger numbers and increasing competition from low-frills airlines coupled with rapidly rising fuel costs. Despite passengers now resuming air travel, the increase has been very gradual. In fact International Air Transport Association

ACHIEVEMENTS OF AIRCRASH INVESTIGATION SOLUTION

Due to the variety of disciplines participating within an investigation, the proposed theoretical research suggests using expert systems as the most effective tools for analysing the accident investigation process. Thus, comprehensive conclusions have been drawn by considering the statistics (forensic data) of accident investigations carried out worldwide, followed by an application of the Delphi enquiry. The Delphi exercise has surveyed a team of aviation experts in order to extract estimates for further improving the accident investigation procedure. This research approach managed to identify the areas and stages of aircraft accident investigation where significant improvements can be made by employment of contemporary technology and science. Additionally, expert systems methodology has pursued a qualitative and quantitative analysis of the factors that have an impact on investigation outcomes. Finally, this methodology has suggested that investigation outcomes could be significantly improved with the application of a global expert system as a tool for storing and analysing the forensic data of aircraft accidents worldwide. This research contribution is not limited to the entire aircraft accident investigation procedure, but can be extended to portions of the investigation as well. This could include potential uses in both technical investigation of aircraft systems and analysis of human factors

INTERNATIONAL STANDARD TO ACCIDENT INCIDENT INVESTIGATION

Aircraft Accident and Incident Investigation contains

Manual of Aircraft Accident and Incident Investigation

Procedures and Checklists

Investigation

Reporting,

Policy on Assistance to Aircraft Accident Victims and their Families sets

Training Guidelines for Aircraft Accident Investigators (Circ 298) outlines

Hazards at Aircraft Accident Sites

INTERNATIONAL ORGANIZATION AND INVESTIGATION SECTION

Accident Investigation Section (AIG)

The Accident Investigation Section (AIG) is responsible for developing and updating Standards and Recommended Practices (SARPs) for inclusion in Annex 13 Aircraft Accident and Incident Investigation; monitoring developments in accident investigation techniques and practices as well as accident prevention matters; monitoring developments in system safety concepts and practices, contributing to the ICAO Global Aviation Safety Plan and the ICAO Universal Safety Oversight Audit Programme (USOAP) managing safety recommendations addressed to ICAO; conducting and participating in seminars on aircraft accident investigation and prevention.

The AIG Section provides guidance on the following subjects
aircraft accident and incident investigation;
training for aircraft accident investigators;
hazards at aircraft accident sites;
assistance to aircraft accident victims and their families;
accident and incident investigation policies and procedures; and
regional accident and incident investigation organization.

The AIG Section supports the Accident Investigation Panel AIGP and the Flight Recorder Specific Working Group FLIRECSWG.

3. METHOD OF DATA ANALYSIS

Gathering and analyzing large amounts of data is crucial to make aviation industry safer. While not a simple task, development of new methods that air safety investigators are using has to be emphasized in order to make the most use out of the available technologies. They are able to provide almost any information needed in extreme detail. Currently, systems such as SMS, ASIAs, or FOQA make use of extensive data analysis.

As more data is available and as the aviation is entering the era of big data more complex systems will be developed, and currency and training of current safety investigators is of the utmost importance. A challenge is placed on the safety segment of the industry to create, structure, and implement systems associated to SRBD and its complex network. This requires cooperation with other industries such as for example IT or mathematics. Air safety investigators play a vital role in this development and are responsible for guiding the industry in the right direction.

DEMOGRAPHY

investigation purpose of accident incident data collection

OPENION	RESPONDENTS	Accident percentage%
Strongly agree	19	38%
Agree	14	28%
Neither agree nor disagree	11	22%
Disagree	4	8%
Strongly disagree	2	4%
Total	50	100%

INTERPRETATION:-

38% of peoples are strongly agree with the accident causes death and proof of investigation due to human failure activities, 28% of peoples are agree, 22% of peoples are neither agree nor disagree, 8% of peoples are disagree, and 4% of peoples are strongly disagree in the accident people death

How confident are you that your personal information is kept confidential when investigation is in progress during an aircraft crash ?

OPTIONS	RESPONDENTS	%PERCENT
Extremely confident	17	34%
Quite confident	13	26%
Moderately confident	8	16%
Slightly confident	2	4%
Not at all confident	10	20%
Total	50	100%

INTERPRETATION:-

34% of people are extremely confident with their personal information is kept confidential when investigation is in progress during an aircraft crash, 26% of people are quite confident, 16% of people are moderately confident, 4% of people are slightly confident, 20% of people are not at all confident.

4. CONCLUSION

When assessing the development in accidents it follows that despite of an enormous progress made in the field of air traffic its safety fail to develop to satisfaction, with causes identified as incomprehensive approaches to learning and appreciation the human factor.

It is comforting that since the beginning of the 21st century, a remarkable improvement has been recorded and the current tendency in the development of air transport safety is positive. A view on the air transportation taken from the aspect of the shares of the continents in terms of accidental rate shows that safety of air transportation in the USA, Canada and Europe is more favourable compared to the world average, however, even at these continents it is still necessary to accelerate efforts for further and substantial improvements.

In brief of the complexity of investigating air accidents and its importance for the measures focused on eliminating the reoccurrence of the identified causes as well as the activity of international organizations of aviation in this field it unambiguously follows that objective determination of the causes of each air accident and consistent anti-accident prevention represent the way that ensure decline in the accident rate of air traffic despite of its estimated growth in performance, all that making air transportation more trustworthy and attractive for its user

5. REFERENCES

Journals and papers