

* **INTRODUCTION**

***Overview***

Aviation accident analysis is performed to determine the cause of errors once an accident has happened. In the modern aviation industry, it is also used to analyze a database of past accidents in order to prevent an accident from happening. Many models have been used not only for the accident investigation but also for educational purpose.

There are four layers in this model: organizational influences, unsafe supervision, precondition and unsafe acts. **Organizational influences:** This layer is about resources management, organizational climate and organizational process. For example, a crew underestimating the cost of maintenance will leave the airplane and equipment in bad condition. **Unsafe supervision:** This layer includes inadequate supervision, inappropriate operations, failure to correct a problem and supervisory violation. For example, if emergency procedure training is not provided to a new employee, it will increase the potential risk of a fatal accident. **Unsafe action:** Unsafe action is not the direct cause of accident. There are some preconditions that lead to unsafe actions; unstable mental state is one of the reasons for bad decisions. **Error and violation:** These are part of unsafe action. Error refers to an individual unable to perform a correct action to achieve an outcome. Violation involves the action of breaking a rule or regulation. All these four layers form the basic component of the Swiss cheese model and accident analysis can be performed by tracing all these factors

***Purpose***

According to the EU Council Directive 94/56/EC “The extent of investigations and the procedure to be followed in carrying out such investigations shall be determined by the investigating body, taking into account the principles and the objective of this Directive and depending on the lessons it expects to draw from the accident or serious incident for the improvement of safety”. The extent of an investigation should depend on the actual or potential consequence or hazard. Incidents that indicate high risk potential should be investigated in greater depth than those with lower risk potential. Although the investigation should primarily focus on the factors that are most likely to have influenced action, the dividing line between relevance and irrelevance is often blurred. Data that initially may seem to be unrelated could later prove to be relevant once the relationship between the different elements of an occurrence are better understood. Investigation and analysis of safety occurrences is an essential ingredient of the overall risk management process in aviation. Effective safety management systems largely depend on the quality of the investigation of reported accidents, incidents and safety issues.

***Problem Definition & Design Thinking***

***Empathy Map***



***Ideation & Brainstorming Map***



* **RESULT**

***Social impact***

The advent of human flight not only boosted our power of movement, but also enhanced our vision: We gained the ability to see the Earth from above. Before the Wrights' epochal breakthrough, there had been perhaps thousands of human flights, mostly in balloons.

***Effect of airplane crash***

In the physical effects, air crash brings about death, disability and injuries. The effects from air crash are determined by among other things, the cause of the crash, the altitude and its speed at the time of crash

***Aircrash prevented***

These include improving aviation safety facilities, modernizing aviation safety services, improving systems for ensuring the safety of aircraft, and improving air traffic information systems



* **ADVANTAGES & DISADVANTAGES**

***Advantage :***

1. Fast delivery times. Undoubtedly, one of the most advantageous features offered by air transport is its speedy delivery times.
2. No Physical Limits.
3. Very reliable transportation.
4. Long Distances.
5. Higher Cost.
6. Less storage capacity.
7. Restrictions on goods.

***Disadvantage :***

1. Aviation accidents can be traced to a variety of causes, including pilot error, air traffic controller error, design and manufacturer defects, maintenance failures, sabotage, or inclement weather.
2. When the aircraft design is inadequate, design engineers should be held accountable.
3. People are often quick to assume weather is a major cause for why planes crash. However, while it has been estimated that 12 percent of all air crashes are weather related, weather is very rarely the only cause involved.

* **APPLICATIONS**

1. Aircrash analysis of safety occurrences is an essential ingredient of the overall risk management process in aviation.
2. Effective safety management systems largely depend on the quality of the investigation of reported accidents, incidents and safety issues.
3. The primary purpose of air crash investigators is to determine the cause of the crash and any contributing factors involved in the crash.
4. To effectively discover the hazards that led to the accident and to prevent their recurrence in a future accident or incident
5. In the physical effects, air crash brings about death, disability and injuries. The effects from air crash are determined by among other things, the cause of the crash, the altitude and its speed at the time of crash.

* **CONCLUSION**

The cause of this accident is the combination of several factors, ambiguously writtenprocedures, inadequate training, unexpected operational situations or individual judg‐ments. Situational awareness, environmental and crew coordination factors, as well asshortcomings in pilot technical knowledge, skills and experience, also can cause acci‐dents. Other mistakes might be the result of improper airspace design or crew coordi‐nation. As an initial event, the clear ice formed on the upper surface of the wings was notdetected and de-iced well. The company instruction, procedures and even the equipmentwere not suﬃcient to remove the clear ice from the wing surface. Hence during the take-oﬀ the clear ice was broken oﬀ the wings and ingested by the engines and caused damagethe engine fan stages, which led to engine surges and failure. The pilot had no suﬃcientknowledge and training to identify the problem and taking the necessary action. Further‐more, there was no knowledge for applying Automatic Thrust Restoration system (ATR)within the company (SAS). Therefore it was activated and increased the engine powerwithout the pilot knowledge. Another contributing cause was poor emergency landingresponses in terms of speed and ﬂap position for approach and landing.Finally, it may be concluded that unsafe pre-conditions which had been created bySAS organization in terms of training, instruction, operational procedures etc. wereblamed for pilot and technicians errors and

* **FUTURE SCOPE**

1. Aviation accident analysis is performed to determine the cause of errors once an accident has happened. In the modern aviation industry, it is also used to analyze a database of past accidents in order to prevent an accident from happening.
2. The primary purpose of air crash investigators is to determine the cause of the crash and any contributing factors involved in the crash. Investigative authorities also provide recommendations for safe operations.

* **APPENDIX**

***Source Code***

***Dashboard1***

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***Dashboard2***

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***Story***

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