ATTENTION ON THE SAFETY OF PLANE AND THE REASON OF AN ACCIDENT

Ujjwal Patel¹, Meet Bechara², Ravikumar Patel³, Vanrajsinh Chauhan⁴
Bachelor of Engineering Student, Mechanical Engineering, Sal College of Engineering, Ahmedabad, India

ABSTRACT

Now a day safety is a main purpose of all people. So need to develop the new design of aircraft reckon with safety. This paper is for circumspect to the people from the reason of plane accident. Because of all traveller want their safety first. So this study tries to show many reason of accident occurs. Like, accident done by birds, the observation mistake done by engineering, mistake of pilot, some of natural circumstances, temptation of company to get more passengers and also get more respect and cost of travelling from people, some of terrorism etc. So need to create the new design of plane including the safety of plane with all comfort and higher efficiency. This study also shows the design of fuselage and it’s affecting load in inner part of fuselage. Laminar flow and Conventional flow is the basic flow to understand the load and friction on the wings. And it’s including the types of wings on plane to get high speed and low speed and also getting less friction and less load of wind with capacity of high loaded plane. With a various system of safety in the plane like six emergency exit and also oxygen gas supplier system while catastrophes.

KEYWORDS: Safety, Load on plane, Accident Knowledge, Various System in plane

INTRODUCTION

Airplane safety has already developed in various design like separable cabin and aircraft with capsule etc. with the purpose of saving humans’ life by catastrophe and any bird hitting and some natural cause. But in that’s all project it’s have to many problems like how to control the speed and how to reduce the jerk of plane’s capsule while dispatching. So, in this study we show that the reason of plane accidents and it’s types with the study of many literature and review paper.

First of all need to be find some patents and research papers and observe it and find some quires and try to define it by some of idea creation and our basic knowledge of plane to make safety. So, in some of research paper is about to create some problem while accident is happened and create a problem of high jerk and opening parachute in high speed. In some of case we lost whole plane except cabin or capsule and we also lost our main engine. So, this all research papers patents are too costly for use and also time taking process and also not capable to save the life of all passengers.

LITERATURE REVIEW

Karl R. Geisler et al, the literature including the positive correlation between the power distance scores. And it is also related to plane crashed reason by the less communication and les concentration on plane while flying between co-pilot and pilot. It is found that per-capita GDP and country scores on the cultural dimension of individualism are inversely related to plane accidents while power distance scores and number of flights are directly related to plane accidents. Continued training for pilots and co-pilots in direct cockpit communication can help overcome cultural barriers and reduce plane accidents [1]. Veng Kheang Phun et al, this research studies on the social influences and public perception is to aviation accidents and airlines. After an accident happened the media use overstate the result and then they put the people in worry about airline safety and its management, resulting in loss of passengers and social panic. According to the Aviation Safety Network a Netherland based online aviation database, the seriousness of aviation accidents can be classified into accident, hijack, incident, other occurrence, unfiled occurrences, write off and hull-loss. So, in this research paper we find a big problem which created by company to get more passengers and to get high profit from people by traveling [2]. QPD van Keyneulen et al, this research paper is about to base on new concept pf plane’s fuselage by passenger review and needed for safety purpose. So this concept is about to increase the length of fuselage and openable fuselage’s part which show in figure 1.
The second figure shows 6 doors of the Emergency exit on the plane. While a catastrophe is happening. Figure 3 and 4 indicate the connection of fuselage with a bolt and stiffeners. So in this research paper we must get the idea of how to join fuselage with increasing the size of fuselage to save the precious life of passengers [3]. Govind Yadav et al, this research is on to plane name G-25 Cyclone and it is including the high gear mechanism for high capacity of stress and strain which is done while plane take-off and landing to reduce the high jerk and stable the whole plane and system with high torque of gear and increase and decrease the speed of plane and get high efficiency of tire gear mechanism. The figure 5 indicates the Bi-propeller rotating mechanism system which includes the rotational axis like anticlockwise rotation and clockwise rotation with Air intake and air outlet and all system connected by the motor. The gear generates high torque for increase speed which have too much load of plane and wing and engine system [4].

T. Muneiah et al, this paper presents the development of a parameterized automated generic model for the structural design of an aircraft wing. Furthermore, in order to perform finite element analysis on the aircraft wing geometry, the process of finite element mesh generation is automated. So its create whole design with geometry automate the process of manufacturing and also make the whole creation with a software with measuring all components and wings parts. Surface of the wings are made by the new creativity of design with the finite elements analysis of airplane wings. The spars and ribs are used to represent the shape of surface. So we learn how to make basic design of plane [5]. Mohamed P. Hassan et al, in this research paper we observe about the old design of military or heavy load transfer plane fuselage. This research paper is about to create a new design with a semi monocoque structure. It’s including a turboprop military transport aircraft and engine enclosure a jet fighter in the inside of fuselage. And they can be use metal material. Because metal is highly capable for stress and easy to manufacturing and design on metal body and cost is also to low cost. So this creation is for decrease hard work and it’s cost. The figure 6 is including the fuselage structure inside a turboprop military transport aircraft and an engine enclosure of a jet fighter, comprising portion of its fuselage(bottom), both having semi monocoque structure [6]. Smithsonian et al, in this project it compare wings, engines, streamlining and controls on seven airplanes. It’s include different types of plane and its size. It’s also include the basic elements of an airplane and explore the basic principle of flight. And also tell us about four forces affect things that fly: weight, lift, thrust & drag. And controlling an
airplane in three axes: - Pitch, Yaw & Roll. The figure indicates the various motion while flying like Pitch is for take-off and landing usage and other is yaw is use for changing the side like left and right side and another one is Roll is for rotating motion. And another figure 7 is including the load that which part have which load like life, Drag, Thrust and Weight [7]. Goh Chin Fei et al, this research paper is about to Financial crisis in 2007-09 which including the cost and comfort comparison between Air Asia and Singapore Airline. So first we need to know about Air Asia so Air Asia is famous for their low price and cost of traveling air tickets and they got first rank in all airline companies. And now we know about Singapore Airline so they including high facilities in their plane to get more passenger and their ticket is also low compare to another companies but its little high compare to Air Asia so all are preferring Air Asia flights. Figure 8 including the ratio of expectation of earning money for Air Asia and Singapore Airline in year of 2007 to 2010. So we show that the ratio of cost in Air Asia is stable compare to Singapore Airlines [8]. Zhang Jun-Tao et al, this research paper is about to inflatable wings. First of all, this inflatable wing’s Structure was failed but after that this research paper is indicate that type of inflatable wings with decreasing the stress and also manufacturing cost and also less design to create that wings. Now we need to understand what is inflatable wing so inflatable wing is one type of flat wing which cannot including any curve in any part of wings in middle or in side and it’s also reduce the stress by its own design. But at this type they are also try to get success to make right inflatable wing and also make working model for their base.

In this figure 9 we show inflatable wings which is straight and flat so it’s reduce the stress while flying [9]. Khairi Yusuf et al, this research is about to make fuselage but in this all structure they try to make light weight fuselage. So they try to design the new fuselage model by using of CAD design to increase the efficiency and increase the stress capability of fuselage with a light weight jet model of fuselage. So they try and set up the whole system and structure like where wings gone, try to set fuselage and try to
together set whole part of the structure by using a CAD design software and try to define the whole new design of fuselage to change the geographic model of plane. This figure is indicating of fuselage structure which is figure 10 and another is load analysis structure in fuselage and its figure 11 [10]. Clinton V. Oster et al, this research paper is about to reason of airplane crashing and cause of accidents worldwide. So it’s including many reason for accidents of flight and also give the information about to region flight.

![Figure 10. Structure of light weight fuselage](image1)

![Figure 11. Load inside the fuselage](image2)

for large commercial passenger jets. Based on a trans log model, they develop an econometric cost function for aircraft operating cost and find that economies of aircraft size and stage length. The data set is increased the length of stage. The cost of traveling is also dependent on the pilot income. The cost-minimising aircraft size is therefore considerably smaller, particularly at short stage lengths, when pilot cost is treated as endogenous, and this helps to explain why US airlines expect to accommodate future traffic growth with more flights instead of larger planes [13]. Holger Babinsky et al, the popular explanation of lift in common, quick, sounds logical and gives the correct answer, yet also introduces misconception, uses a nonsensical physical argument and misleadingly invokes Bernoulli’s Equation. A simple analysis of pressure gradients and the curvature of streamline is presented here to give a more correct explanation of lift. Figure 12 indicate the load on wings and how wind is give stress load on wings and how its cut from wings [14]. ATSB et al, Birdstrikes continue to be a problem for aviation worldwide, costing approximately 3 billion US$ annually. Increasing, funds are being directed towards research which focuses on bird control and avoidance method. To such methods which are proving to be successful, are the use of hand held laser devises to scare birds from the airport environment, and the use of US development Avian Hazard Advisory System (AHAS), which allows aircraft to avoid high-risk
Birdstrike area. This figure 13 show that the accident of bird on engine blades and on roof and front part of fuselage. So it’s show that bird accident is to dangerous and high maintenance for plain [15]. ATSB et al, in this research paper they include the fuel exhaustion and starvation. Fuel exhaustion and fuel starvation accidents continue to be a problem in the Australian aviation industry, accounting for over 6 per cent of all accidents between 1991 and 2000. Within Australia, fuel exhaustion refers to those occurrences where the aircraft has become completely devoid of useable fuel. Fuel starvation refers to those occurrences where the fuel supply to the engine(s) is interrupted, although there is adequate fuel on board the aircraft. The current study investigates the overall rates of, factors contributing to and significance of fuel-related accidents between 1991 and 2000[16]. Milton O. Thompson et al, this literature review is based on the increment in plane model day by day. So this review indicates the superfast plane with increasing speed compare to old model. So most of all this design of plane they change the size of fuselage and decrease its size and increase the speed and also decrease the stress which are on wings. And they create high speed plane with a big fuselage with a changing its geographical modelling [17]. Arnold Barnatt et al, This review paper tries to show that record of accident which were happened
between 1987-1996. So it’s also include the cost of repair the plane after accident and also estimate the price need after solve the problem of accident. The specialized topics we consider include: 1. how to measure passenger safety (and how not to do so) 2. The volatility of mortality-risk data given the rarity of air crashes. 3. Implications of the ValuJet crash. 4. The comparative safety of auto trips and commuter flights. 5. The assertion that US airlines are “the safest in the world” 6. An “ecological fallacy” that might cause exaggerated perceptions about the risk of flying Developing-World airlines [18]. Richard Whitcomb et al, here we learn about Foam Wing. It’s one type of wing for get higher efficiency. Participants in the foam wing activities will learn about motions and forces, and transfer of energy as they explore Bernoulli’s Principle. They will also have the opportunity to wear a giant foam wing while standing before a simulated wind tunnel in order to experience the sensation of lift. This figure 14 and 15 indicates the types of wings to get higher efficiency and also set the wing in different types of plane like large and small plane. And it’s also show the two types of flow one is Laminar Flow and second is Conventional Flow [19]. T. P. Wright et al, this research paper is our too oldest ever to find the cost of plane and also find the factors affecting on airplane. In this research paper we also find the parts of airplane which can use for joint the wing. And in this literature review they also talked about the Non-Consecutive Orders which including to considering the judgment of ow to set curve and ow to increase the efficiency and they also mansion the body part material and they said metal is best for design the plane and also reduce the cost of manufacturing and it’s also including the labour’s observation and their importance. This figure 16 indicates the curvature parts of airplane making which contain the joint of wings and fuselage to make it proper. But now a day they change all part to reduce cost and also increase the proper joint [20].

CONCLUSION

In this chapter on the basis of literature survey and different patents can be conclude that safety is a measure function while consider the travel by plane. So the aim of this study is to focus on different aspect of safety. In this consult the literatures survey shows the different aspect of airplane design, their material, etc. So study shows a different consultation of safety in this project the prime focus of this study to safety. In this review paper separable wing can be used for decrease the load of fuselage to open the parachute by misfortune the accident is occurred but to save the life of passenger this system opens the parachute in low speed and balance the body from high jerk and control the whole system. The system secures the life from any type of natural circumstances.

REFERENCES

[2] Veng Kheang Phun, (December 2015), THE EFFECT OF AVIATION ACCIDENT ON PUBLIC PERCEPTION TOWARD AN AIRPLANE.
[3] QPD van Keyneulen, (September 27, 2015), DESIGN OF A MODULAR FUSELAGE FOR COMMERCIAL AIRCRAFT.
[9] Zhang Jun-Tao, Hou Zhong-Xi, Gou Zheng, Chen Li Li, (2012), ANALYSIS AND FLIGHT TEST FOR SMALL INFLATABLE WING DESIGN.
[14] Holger Babinsky, (2003), HOW DO WINGS WORK?
[15] Australian Transport Safety Bureau, (March 2003), THE HAZARD POSED TO AIRCRAFT BY BIRDS.
[16] Australian Transport Safety Bureau, (January 2003), AUSTRALIAN AVIATION ACCIDENTS INVOLVING FUEL EXHAUSTION AND STARVATION.
[19] Richard Whitcomb(NASA), (1952), PRINCIPLES OF FLIGHTS.
[20] T. P. Wright, Curtiss Wright, (February 1936), FACTORS AFFECTING THE COST OF AIRPLANES.