



Aviation Safety and Pilot Controls

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INTRODUCTION

Knowing the culture around aviation safety is very crucial to containing cost and improving corporate effectiveness. In the early Twentieth Century, civil aviation went through unprecedented development. As technology has evolved over time, early pioneers such as the Wright brothers, Charles Lindbergh, Amelia Earhart, and many others, led to a number of discoveries that became part of aviation design and practice. During the Twentieth Century, this completely transformed the landscape for air transport. With the new dimension, this has been reinforced by massive routes and carriers due to deregulations between the U.S. and Europe in the 1970s through the 1990s (Pozzo, 2015). This project is about the effectiveness of technology on aviation over the past 100 years, highlighting that technology has reduced pilot error and thus reduced incidents. This project compares two case studies: the Wingfoot Airship Disaster in 1919 and the Southwest Flight 1380 incident in 2018.

The Wingfoot Airship Disaster took place in Chicago, IL on July 21, 1919. The airship departed from Grant Park to White City Amusement Park. There were only 15 people on board, most of whom were reporters. During its flight at 1,200 ft, a fire broke out and the airship exploded over the buildings. It then collapsed into sheets of fire, which crashed into the glass window of Illinois Trust & Savings Bank. There were 10 deaths in the building during the fire (New York Times, 1919). The airship had been filled with hydrogen gas, which is highly flammable. Some of the crew have said that perhaps a small amount of oxygen entered the gas mix. Others suggested that it may have been caused by a spark from a rotor that was overheated by the sun.

In 2018, Southwest Airlines Flight 1380, en route from New York LaGuardia (LGA) to Dallas Love Field (DAL), experienced engine failure on the left engine (CFM-56-7B) and the loss of engine int during flight level 320 (NTSB, 2018). This caused the plane to divert to Philadelphia (PHL). The fragments of the engine inlet struck the wing and fuselage, resulting in depressurization and the loss of one passenger. Investigators found out that the inlet cowl was missing. The engine's fan blades had accumulated more than 32,000 engine cycles over the course of their service life. Maintenance records showed that the fan blades had been periodically lubricated as required.

RESEARCH METHODOLOGIES

Two case studies about aviation safety and pilot controls were selected to compare: one modern and one from 100 years ago.

Data was collected and analyzed from these case studies by the safety details of each flight and comparing the two.

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DATA AND FINDINGS

Figure 1: Decrease in aviation accidents as safety protocols and technologies were introduced

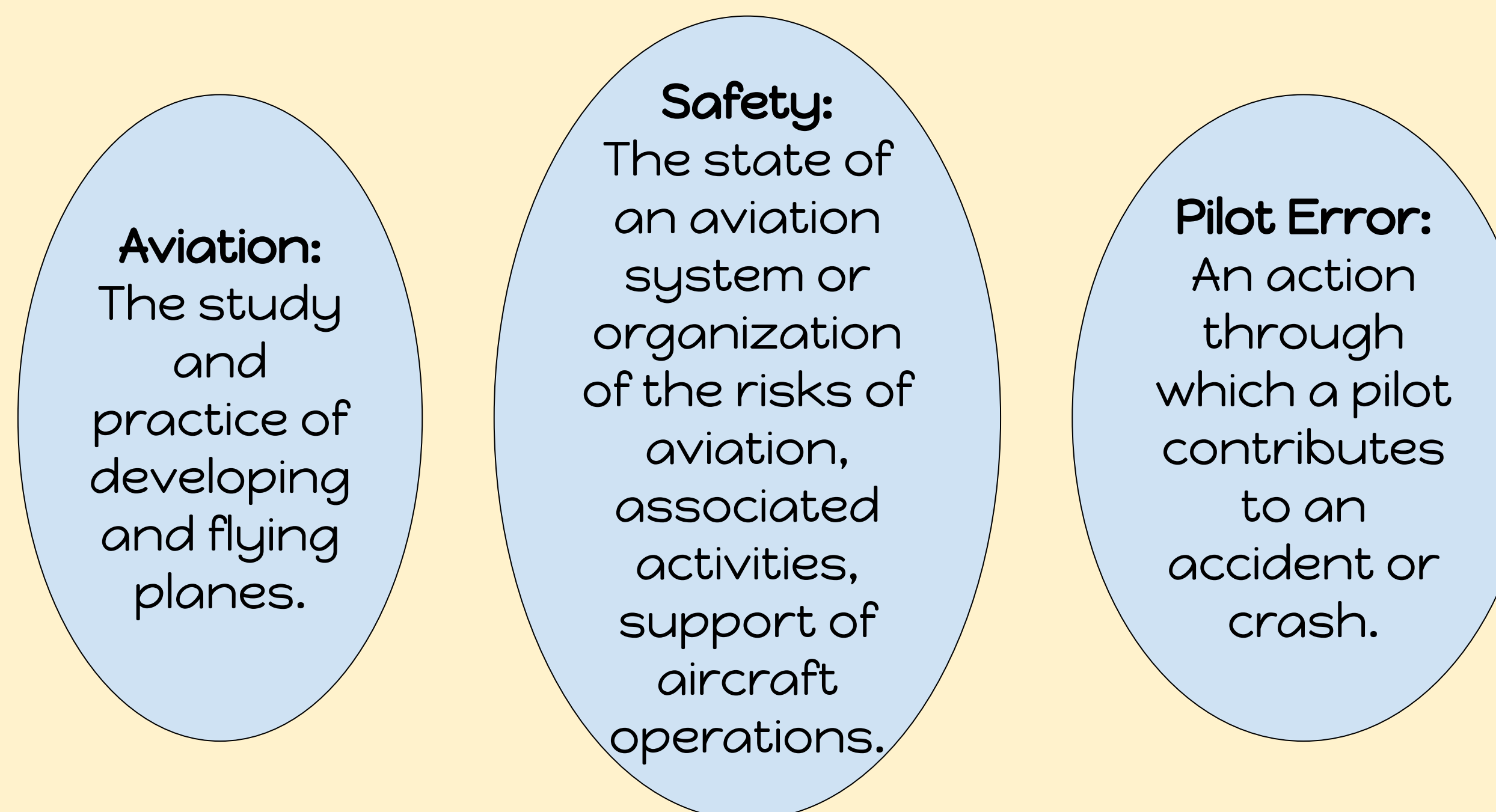
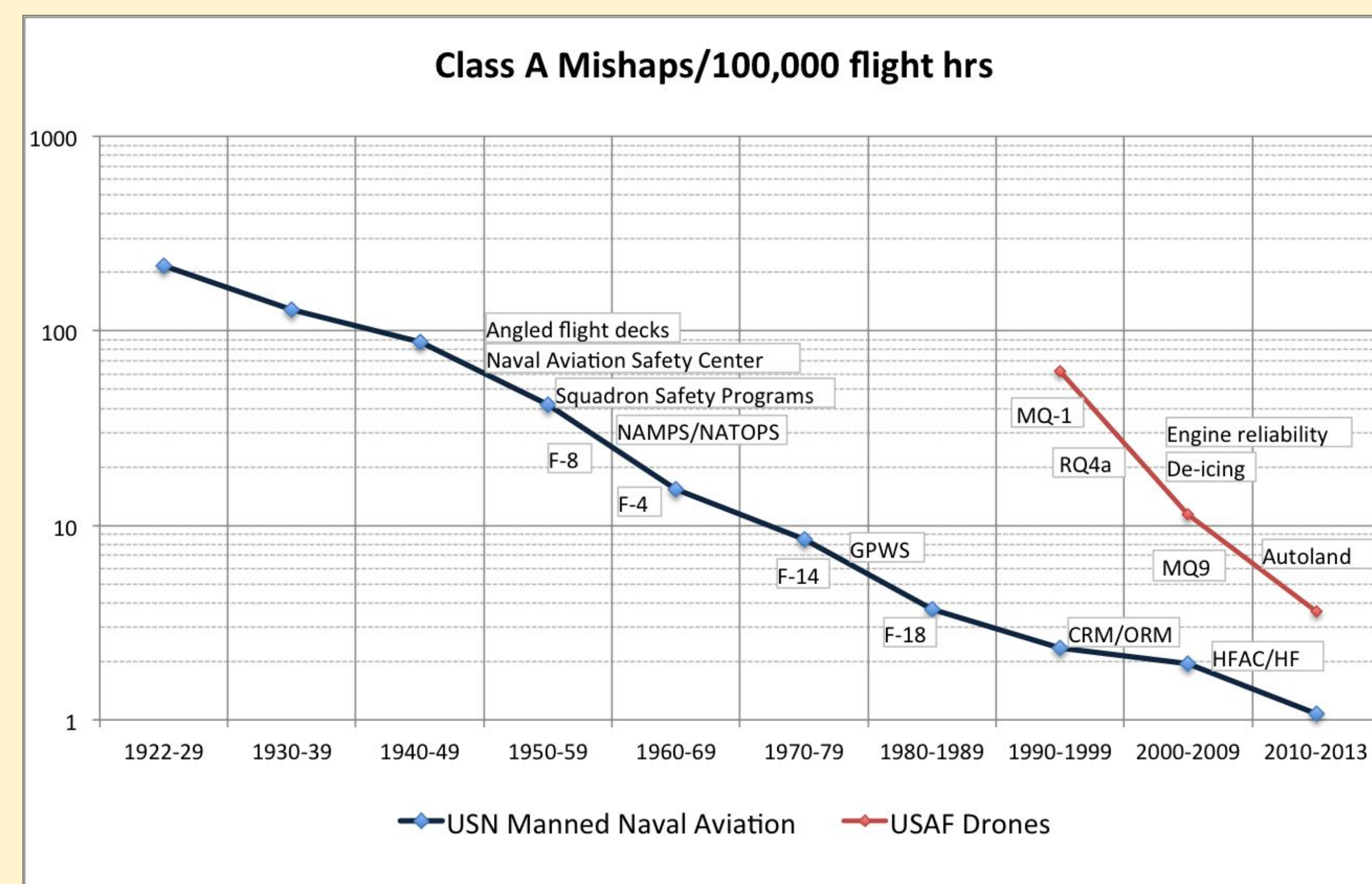


Table 1: Comparisons of case studies

Factor	Wingfoot (1919)	Southwest (2018)
availability of data	exact cause of fire unknown; available data is from newspaper archives	black box data shows details of what happened during the incident
Fatalities	13/15 (87%)	1/149 (<1%)
Cause of crash/accident	fire caused by oxygen mixing with the hydrogen used in the aircraft	engine failure
Type of aircraft	dirigible	airplane
Safety practices performed	the pilot diverted from the planned course to let passengers take photos of the city of Chicago	the pilot followed the flight plan until the engine failure occurred and diverted to a nearby airport

IMPLICATIONS AND NEXT STEPS

There has been many improvements in maintenance and safety in aviation. However we need to understand the current condition of the equipment and identifying and fixing the issues before the equipment can cause an accident.

In order to address the ongoing issue of equipment failure on different aircrafts, further studies should be conducted on maintenance practice and reliability of equipment.=

CONCLUSIONS AND ANALYSIS

As Figure 1 shows, the introduction of new technology has also decreased the number of mishaps. However, as Table 1 shows, equipment failure remains an issue.

The main concern in both case studies is equipment failure. However, there were some important differences that led to different outcomes in the two accidents. In the Wingfoot incident, there were few safety procedures at the time, and the pilot did not follow the procedures they did have. In the Southwest crash, the pilots followed procedure, so when the engine failure occurred, the pilots were able to land safely. As a result, the fatality rate was 87% for the Wingfoot crash and just 1% for the Southwest incident.

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