Aviation case study essay

What is a case study?
- An account of an activity, event or problem
- Real or hypothetical, past or present activity/event/problem
- Applies knowledge or particular theories to support analysis and recommendations
- Requires analytic, reasoning & decision making skills in order to:
  - Identify issues or problems
  - Make recommendations or suggest solutions to the problems

Case studies are used to:
- answer a series of specific questions about a case
- analyse the causes and consequences of a real situation and discuss the lessons learned
- solve a problem where you need to first write a clear description of the case before you can analyse the situation & make recommendations
- solve a problem by developing a new design
- imagine or role play a situation and make plausible recommendations
- respond to a more general topic or situation

Structure of a case study essay

**Introduction**
- Introduce topic/context
- State argument/main idea
- Outline main points

**Discussion**
- Body paragraphs - number will depend on word count of assignment
  - Topic sentence
  - Explanation
  - Evidence
  - Example
  - Concluding sentence

**Conclusion**
- Restate argument/main idea
- Sum up

**Recommendations**
### Sample introduction

The impact of sleep on a pilot’s performance has attracted the interest of both aviation authorities and researchers for some time. One specific factor, sleep inertia, which is the physiological state that immediately follows wakening, has been found to impair mental and manual operations. Sleep inertia has been linked to a number of aviation incidents involving pilot error. This case study will analyse the role sleep inertia may have played in the crash of Air India Express Flight IX-812 at Mangalore in India on May 22nd 2010. The report of the subsequent Court of Inquiry along with literature relating to sleep inertia will form the basis of the analysis. First, research findings about sleep inertia generally, and sleep inertia in aviation specifically, will be examined. An account of this particular incident and the major findings of the Court of Inquiry will then be provided. Next a discussion of the impact of sleep inertia played in this incident and the lessons that can be learnt from this will be presented. Finally, recommendations for how such incidents can be avoided in the future are made.

### Sample body paragraph

One factor which may contribute to this chronic fatigue among pilots is the extended flight duty period associated with long-haul, international flights. In particular, pilots of these flights are likely to have duty periods in excess of 8 h and thus are at the greatest risk for performance impairment due to fatigue (Rosekind et al. 1995). For example, a 9-h flight may involve a duty period of 12 h or more. Justifying concerns with regard to the potential dangers associated with these long-haul flights and extended duty periods, Goode (2003) examined the records of accidents in commercial aviation between 1978 and 1999 and found a significant relationship between flight duration and frequency of accidents. Additionally, pilots have reported increasing fatigue across the duration of the flight (Gundel et al. 1995; Petrilli et al. 2006), suggesting that the combination of time-on-task fatigue (Samel et al. 1997) and the strong drive to sleep after someone has been awake for a long period of time (that is, homeostatic sleep pressure) may lead to a serious deterioration in the pilots’ alertness and performance. However, several other factors have been found to affect alertness on long-haul flights.

(Adapted from Government of India Ministry of Civil Aviation 2010)
Sample conclusion

This case study examined the role sleep inertia may have played in the crash of Air India Express Flight IX-812 at Mangalore in India on May 22nd 2010. Studies of human factors in aviation have shown that a variety of factors influence the severity and duration of sleep inertia. These factors include depth of sleep, timing of sleep and chemical influences. If a crew member is awakened from a deep sleep, then it is likely their reaction time performance will be adversely affected. This appeared to be the case for Air India Express Flight IX-812 where the Captain was in a long sleep during the flight. As a result, upon awakening, the Captain’s judgment appeared to have been impaired, resulting in a series of poor decisions. This case highlights the need for an effective Fatigue Risk Management System (FRMS) and a Crew Resource Management (CRM) system, along with focused training to ensure crew are fully aware of the impact of sleep inertia on performance, particularly decision making.

(Adapted from Government of India Ministry of Civil Aviation 2010)

Sample recommendations

Based on the main findings of this case study, four key recommendations are proposed. First, as fatigue impairs alertness and performance, it is recommended that CRM training and refreshers for all flight crew should be conducted as required by DGCA vide Operations Circular No 2 of 2001. Furthermore, it is imperative that CRM training include both classroom and simulator training. In the past, crewmember fatigue has been managed by placing limits on the maximum flight and duty hours but the developing knowledge of the effects of sleep and circadian rhythms highlights the importance of managing and controlling the risks of fatigue-related accidents and incidents. Third, it is important that pilots are able to identify the symptoms of fatigue both in themselves and others. Finally, the use of an effective Fatigue Risk Management System (FRMS) through the collection of data and a formal assessment of risk is essential in balancing safety, productivity and costs in the aviation industry.
Why reference?
- Avoids plagiarism & maintains academic integrity
- Shows exactly where the information comes from
- Strengthens your argument or provides evidence to support your position

When to reference?
- Paraphrasing the words and ideas of others
- Summarising the words and ideas of others
- Quoting the words of others
- Copying the data, graphs, images and tables of others
- Mentioning the ideas or work of others (unless it is considered general knowledge)

How to reference?
1) Include in-text references which provide:
   - Author’s surname or family name
   - Year of publication
   - Page number (when quoting, using data, graphs, tables and images from a specific page or pages)
2) Include a reference list which provides full bibliographic details of sources referenced in your report

Additional resources:
For resources on referencing (including UniSA Harvard and APA referencing styles) and academic integrity, go to UniSA’s referencing website.

References