

Aircraft Air-intake Icing on the Ground as a Mechanism of the Motion in MIRCE Mechanics

Dr Jezdimir Knezevic,
MIRCE Academy, Woodbury Park, Exeter, EX5 1JJ, UK

MIRCE Mechanics is a scientific theory of the motion of maintainable systems through MIRCE Spacetime resulting from any actions whatsoever and the actions required to produce any motion accurately proposed and demonstrated. Hence, the main purpose of this paper is to address the air-intake icing as a mechanism of the motion in MIRCE Mechanics that causes the transition from the positive to the negative in-service state of an aircraft. To address this mechanism the Loganair scheduled cargo flight for the Royal Mail, from Edinburgh-Turnhouse Airport, Scotland to Belfast International Airport, has been selected for the analysis. The flight took place on 27th February 2001, with 17.10 take off and ditching into water several minutes later, killing both crew members. A few other examples, where this mechanism caused the transition to the negative state, with similar consequences, are also mentioned in the paper.

1. Introduction

2. Aircraft Ground Air-intake Icing Phenomena

3. Loganair Flight 670A on 27th February 2001

- 3.1 The Aircraft
- 3.2 The Crew
- 3.3 Environmental Conditions
- 3.4 The Takeoff
- 3.5 The Accident
- 3.6 Actions that Caused Occurrence of Negative In-service Event

4. Other Occurrences of Aircraft Ground Air-intake Icing Phenomena

5. Functionability Analysis of the Air0intake Icing Event

- 5.1 Sequence of Pre-flight Events
- 5.2 The Accident Flight
- 5.3 Operating Procedures
- 5.4 Ground Handling Procedures

6. Results of the Functionability Analysis of the Air0intake Icing Event

7. Conclusions

MIRCE Mechanics analysis of the factual results available [2] regarding the Loganair Flight 670A on 27th February 2001 that lost all power on both engines soon after take

off from Edinburgh and ditched into water several minutes later was presented in this paper. The action that caused this fatal event was the release of previously accumulated frozen deposits that were considered to have been accumulated whilst the aircraft had been parked overnight without engine intake blanks fitted.

Hence, this is another confirmation of the validity of the MIRCE Mechanics Axiom which states that “*The probability of a human error in the execution of any functionability action is greater than zero*” [7]. Even further, it is also confirmed that causes of in-service failures are not always due to the malfunctioning of internal components of a system, but also from environmental impacts and humans actions. In summary this paper provides further confirmation that in-service reliability and safety considerations of a large number of modern maintainable systems are complex properties whose full understanding requires scientific approach towards understanding intricate mechanisms that lead to the occurrence of in-service failures, starting from atomic structure that drives the behaviour of matter, up to the solar system that drives the energy conversions (a physical scale ranging from 10^{-10} to 10^{10} metre). Then and only then, can accurate and meaningful reliability and safety predictions become possible, enabling the ultimate goal of reducing the probability of the occurrence of functionability events (in-service failures) during the life of maintainable systems.

8. References

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