



Pilot Incapacitation

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I. Definition

Pilot Incapacitation is the term used to describe the inability of a pilot, who is part of the operating crew, to carry out their normal duties because of the onset, during flight, of the effects of physiological factors.

II. Description

Death is the most extreme example of incapacitation, usually as a result of a heart attack, but is not necessarily the most hazardous. Although most recorded deaths of operating pilots in flight have been found to be due to cardiovascular disease, by far the most common cause of flight crew incapacitation is gastroenteritis.

Incapacitation may occur as a result of:

- The effects of Hypoxia (insufficient oxygen) associated with an absence of normal pressurization system function at altitudes above 10,000 ft.
- Smoke or Fumes associated with an In-Flight Fire or with contamination of the air conditioning system.
- Gastro-intestinal problems such as severe Gastroenteritis potentially attributable to Food Poisoning, or to Food Allergy.
- Being asleep.
- A medical condition such as a heart attack, stroke or seizure, or transient mental abnormality.
- A Bird Strike or other event causing incapacitating physical injury.
- A malicious or hostile act such as assault by an unruly passenger, terrorist action or small arms fire, or possibly malicious targeting of aircraft with high powered lasers by persons on the ground.

Unless the incapacitation occurs on a single pilot operation, incapacitation of one pilot may not be immediately obvious, become only progressively evident, or escape notice altogether until an unexpected absence of response or action occurs.

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Causes of incapacitation in airline pilots, in order of frequency. (Adapted from Buley, 1969; Green and James, 1991)

1.	Uncontrollable bowel action (21%) and "other" gastrointestinal symptoms (54%)	75%
2.	Earache/blocked ear	8%
3.	Faintness/general weakness	7%
4.	Headache, including migraine	6%
5.	Vertigo/disorientation	4%

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Incapacitations can be divided in two operational classifications

Obvious

Obvious incapacitations are those immediately apparent to the other crew members. The time course of onset can be "sudden" or "insidious" and complete loss of function can occur.

Subtle

Subtle incapacitations are frequently partial in nature and can be insidious because the affected pilot may look well and continue to operate but at a less than optimum level of performance. The pilot may not be aware of the problem or capable of rationally evaluating it. Subtle incapacitations can create significant operational problems

III Effects

Clearly, if the single pilot of a small aircraft becomes incapacitated then the safety of the flight is liable to be severely compromised and Loss of Control may result. However, for the two pilot case typical of larger transport aircraft, incapacitation of only one of the pilots is unlikely to present a significant risk given the attention which pilot training, especially for low minima precision approaches, is usually required to give to the implications of single pilot incapacitation.

Loss of Separation may be a secondary effect of total crew incapacitation or side effect of the additional workload imposed upon the remaining crew member(s).

IV. Solutions

The key to avoiding serious problems from the incapacitation of one pilot in a multi crew aircraft is the availability of appropriate SOPs and recurrent training which includes practice in their use.

Correct control of both the aircraft pressurisation system and, if necessary, use of the emergency oxygen supply will both prevent Hypoxia and protect the crew from the effects of Smoke and Fumes. Therapeutic Oxygen supplies can also alleviate the condition of a crew member or passenger suffering a medical condition. Staggering crew meal times and ensuring that each pilot eats different meals both prior to and during flight, will usually prevent both pilots becoming incapacitated due to Food Poisoning and is currently common practice. Intentional sleep whilst on the flight deck may be relevant on long haul flights but should only take place if an appropriate SOP exists and is followed.

The first indication that a controller might get of total flight crew incapacitation is Loss of Communication. Having tried all means, without success, to contact the aircraft, it is extremely difficult for a controller to ascertain what is happening on an aircraft. If the aircraft autopilot is engaged then it will be likely to follow the flight plan route towards the destination. Conforming with standard loss of communication procedures, military aircraft can be tasked to intercept the aircraft and inspect it visually but there is little that a controller can do other than ensure the safety of surrounding traffic by maintaining separation.

<https://youtu.be/5J9kT5v8AfA>
