Aeronautical Therapy

Lesson Plan

- Objectives
- Safety Information
- Aerodynamics
- Aviation Regulations
- Weather Theory
- Emergency procedures

Objectives

Give the self-assurance that will allow you to apprehend your upcoming travel.

Bring rational explanations about flight, risks and mitigations.

Safety Information

ICAO iSTARS4.0

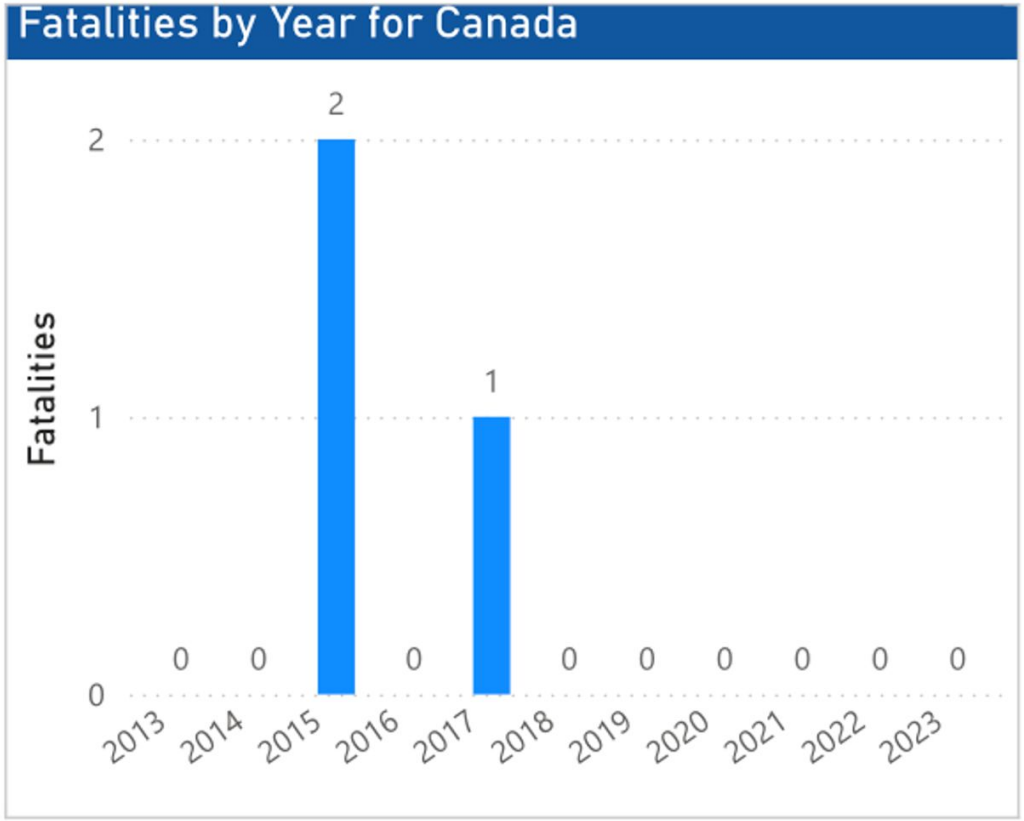
Accidents

63
Accidents

6.11
Accident Rate
Per Million Departures

2
Fatal Accidents

3
Fatalities



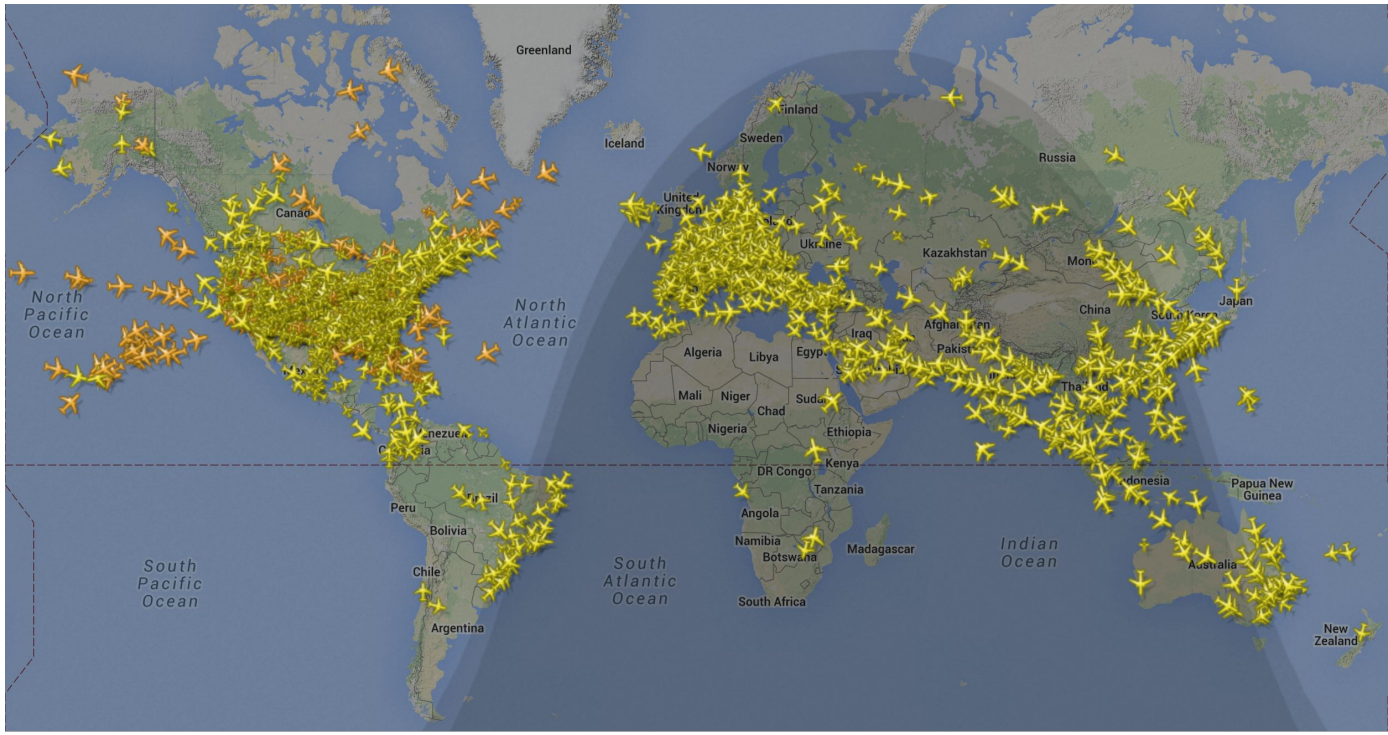
Safety Information

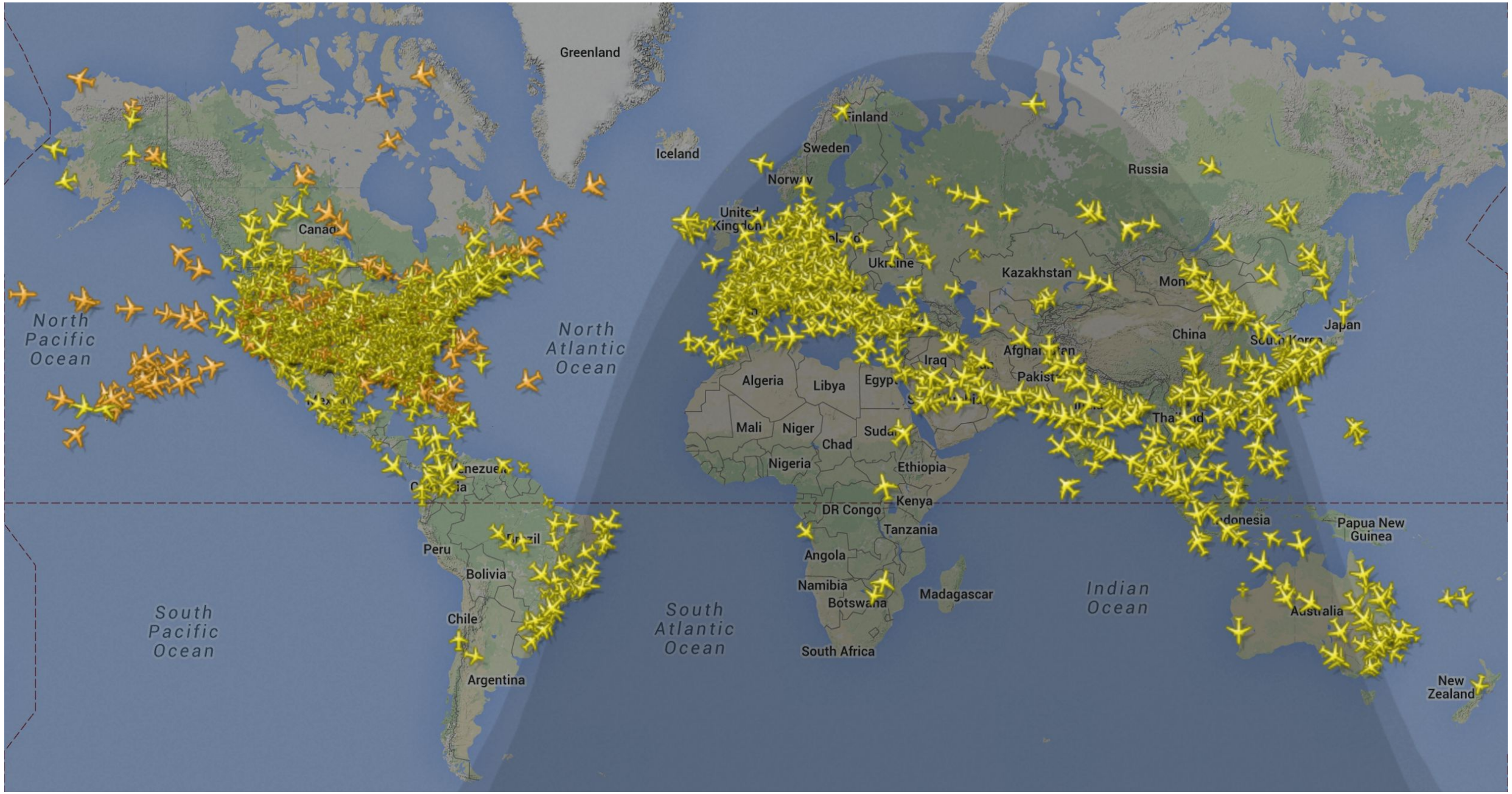
With data from 2024 (Until June 16th):

- There is going to be approximately between 35.9 and 40.1 million commercial flights in 2024.

- It is expected to reach 9.4 billion pax transported by the end of the year.

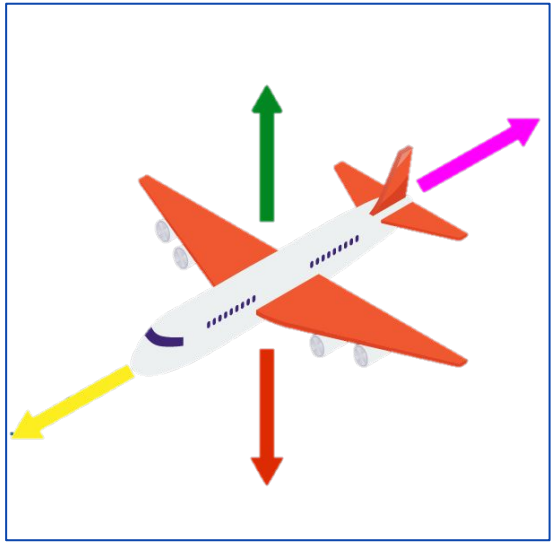
- On August 11th of 2023, airlines operated 18.6 million seats, making it the busiest day of the 2023 period.



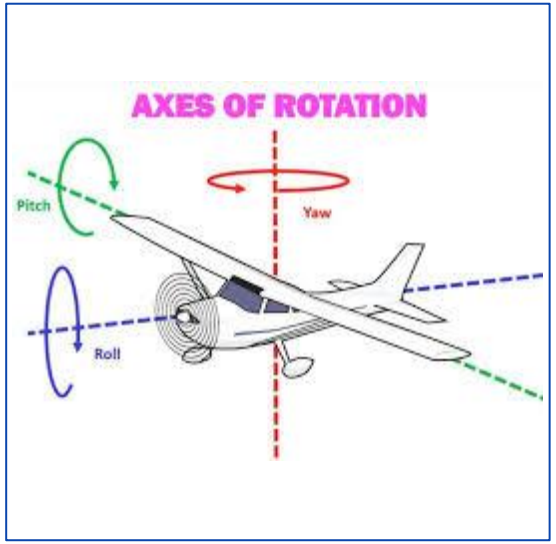

Greenland
Iceland
Finland
Sweden
Norway
Russia
Kazakhstan
China
Japan
Mongolia
Afghanistan
Pakistan
Iraq
Algeria
Libya
Egypt
Mali
Niger
Chad
Nigeria
Ethiopia
Kenya
DR Congo
Tanzania
Angola
Namibia
Botswana
Madagascar
South Africa
Peru
Bolivia
Chile
Argentina
Indonesia
Papua New Guinea
Australia
New Zealand
North Pacific Ocean
North Atlantic Ocean
South Pacific Ocean
South Atlantic Ocean
Indian Ocean

Aerodynamics

Forces of Flight

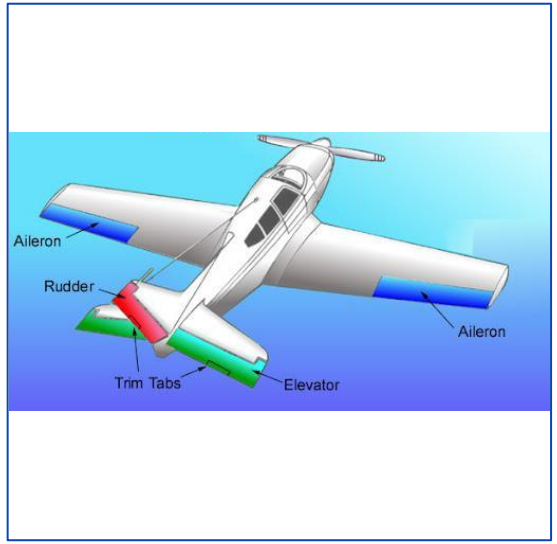


Axes of Movement



Engines

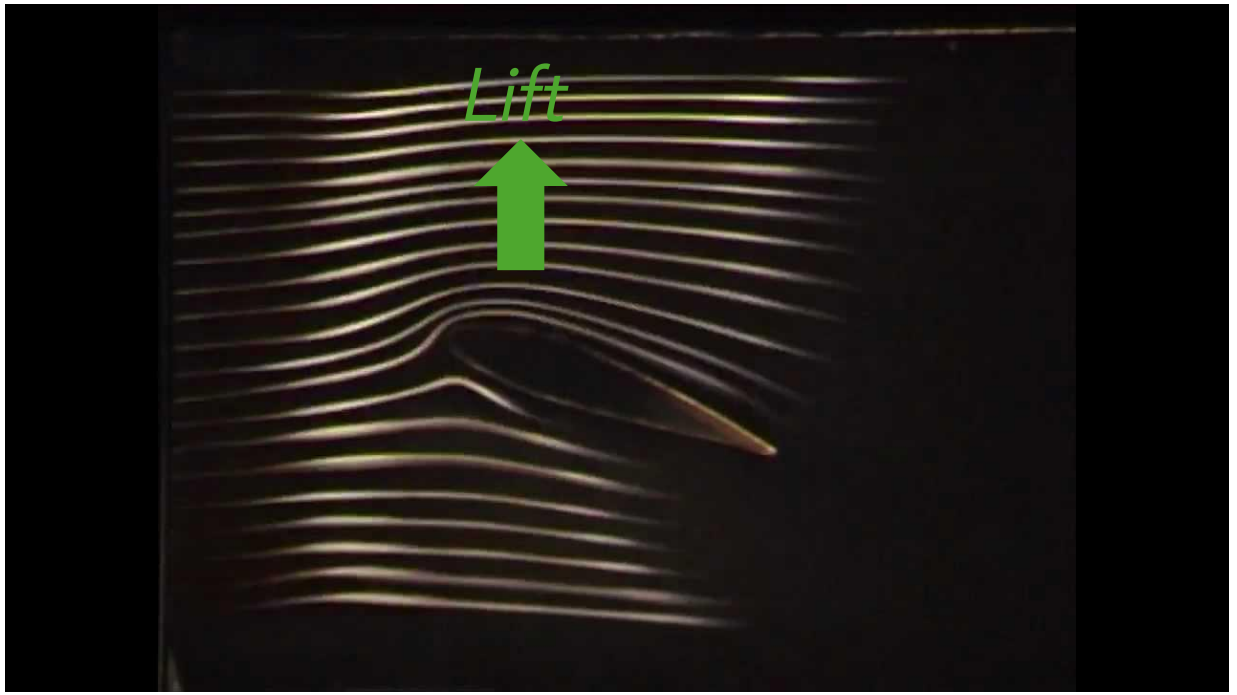
Flight Controls



How does the airplane fly?

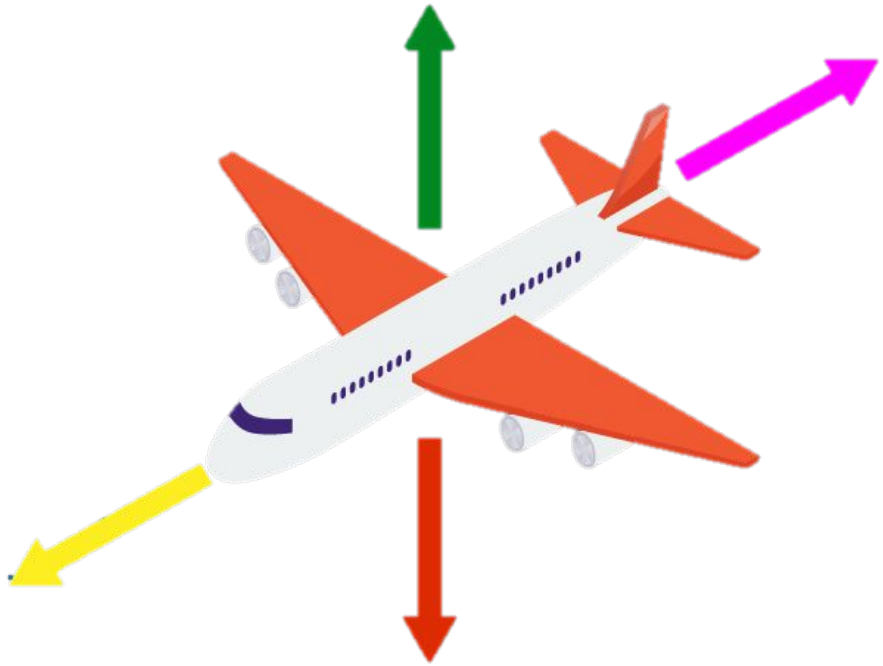
- How does the airplane fly?
- Which are the forces acting during flight?

Daniel Bernoulli

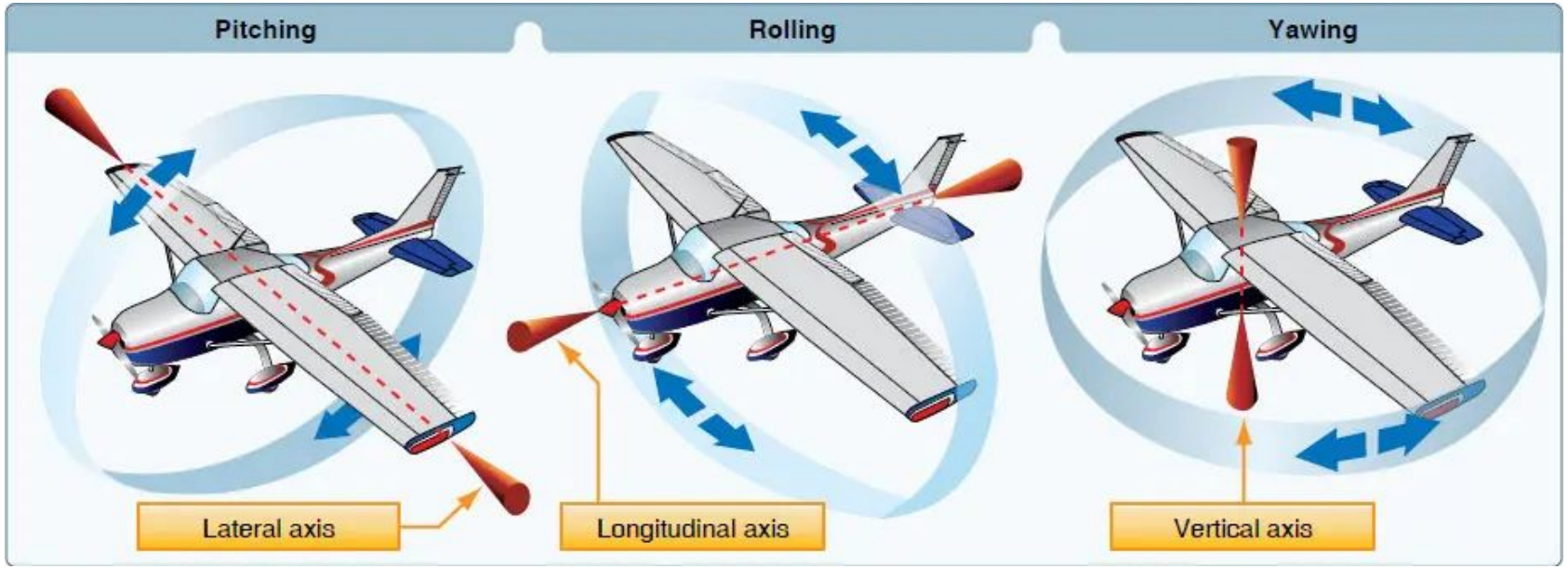


Forces of Flight

- Lift
- Weight
- Thrust
- Drag



Axes of movement

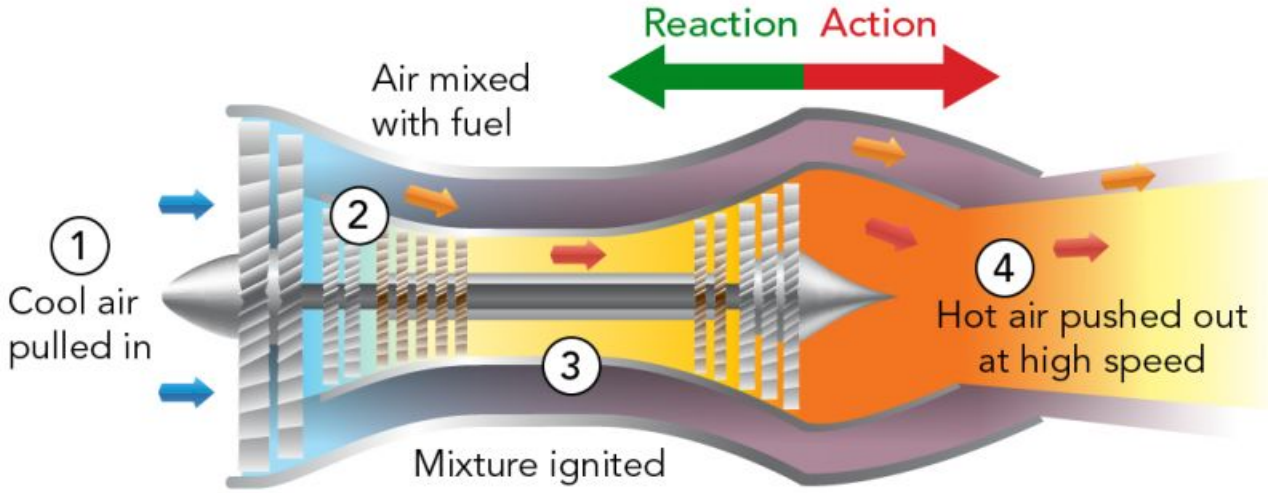


Engines

Engines help us generate thrust. And thrust is generated by:

- **Expansion of hot gases**
- **Air pushed back by the fan**

Thus, engines also go through different safety inspections to ensure proper operation



Engines (Safety Inspections)

The Trent 1000 engine

has more than:

12,000 flight time in testing

4,800 in flight testing

1,800 flights before certification.

Engines (Maintenance)

A Check:

Every 300 cycles or 125 flight hours, whichever comes first.

B Check:

Every three months.

C Check:

Every 12 - 18 months

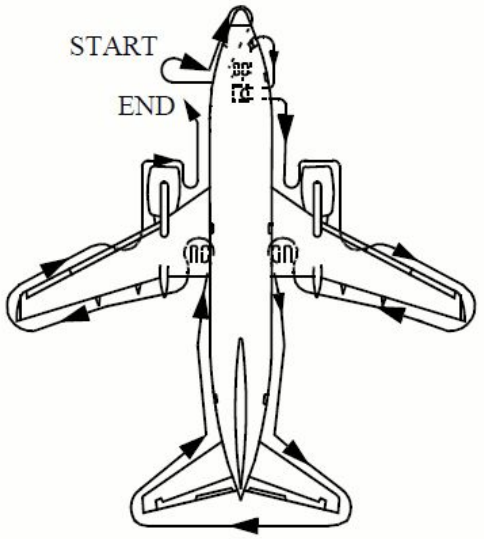
D Check: (high maintenance visit)

Every 4-5 years (Lasts 2-3 months)

Flight Controls (Safety Inspections)

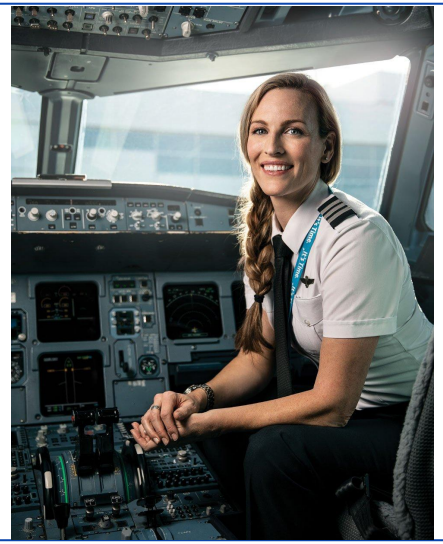
Walk arounds are performed to verify exterior components.

If there are anomalies, the flight won't take place until the aircraft is re-inspected thoroughly and repaired if needed.



Regulations

Pilots



Flight Attendants

Flight Planning

Approach Categories

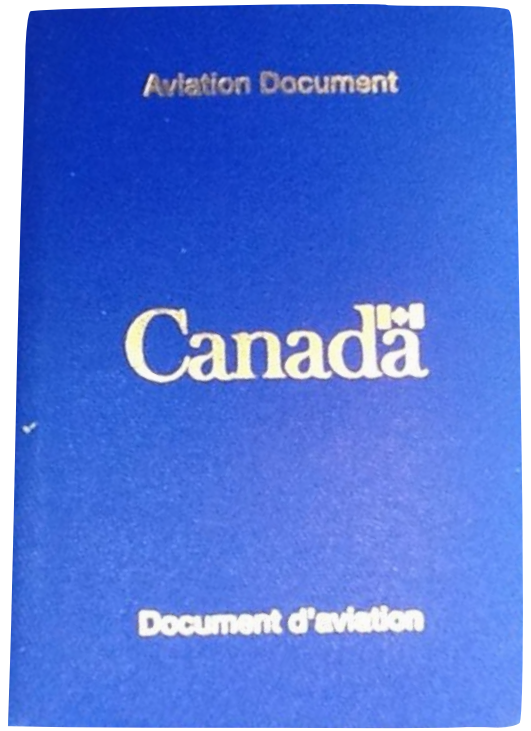
Pilots

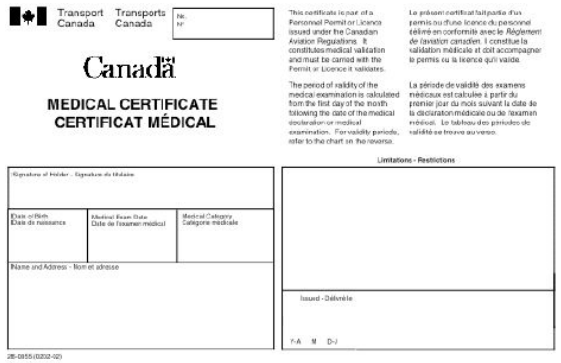
Both pilots need:

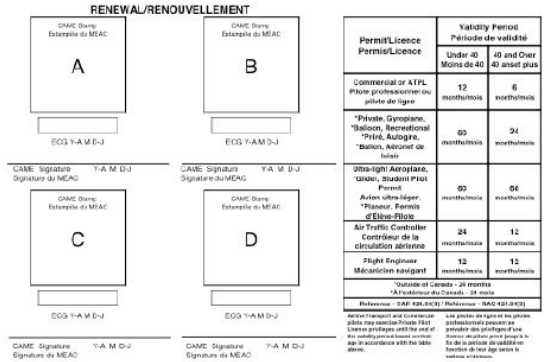
- Aviation document issued by Transport Canada.

- A class 1 medical certificate performed by a certified doctor once a year (twice if +40 years old)

- Specific training for the type of aircraft







Flight Attendants

Flight attendants receive an extensive initial training. Additionally, they must pass their medical certification and undergo recurrent training (once a year).

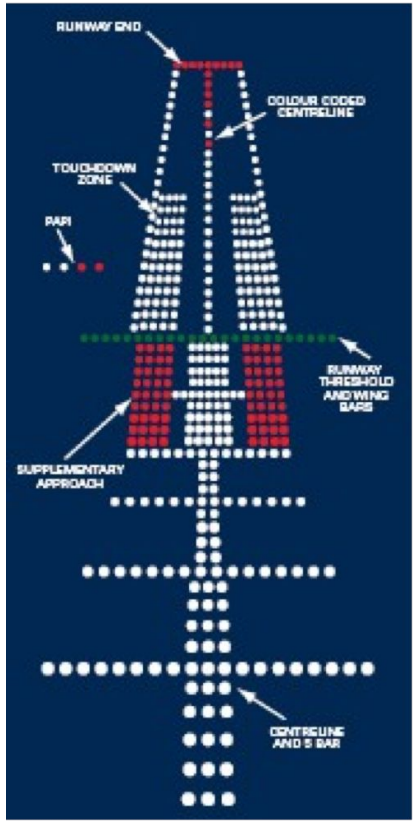
Flight Planning

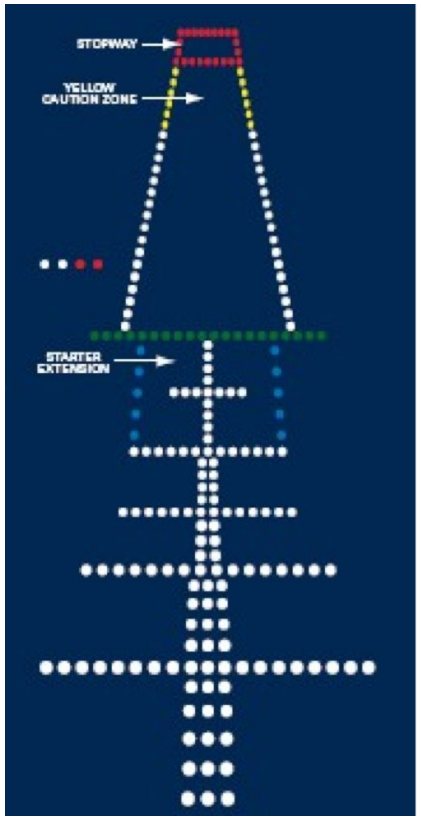
A Pilot must gather all available information concerning their flight prior to takeoff.

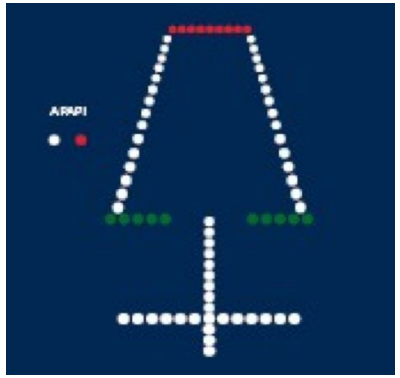
Approach Categories

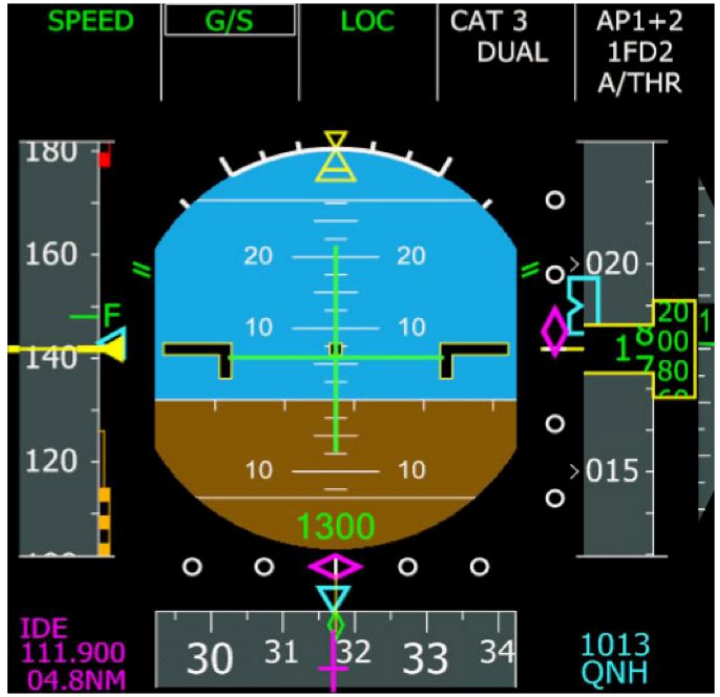
ILS Approaches

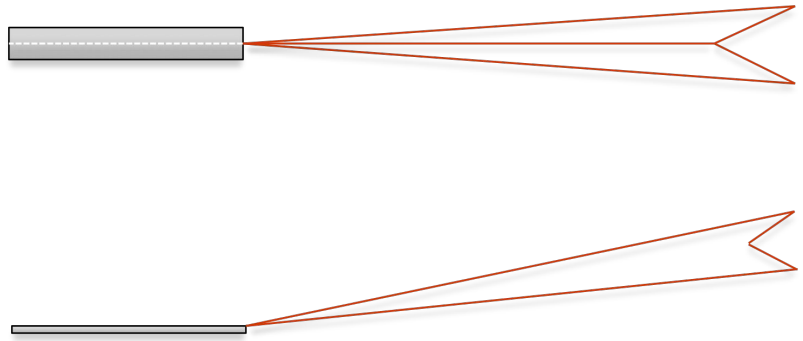
When visibility falls under certain values and becomes zero visibility, some pilots are train to do automatic landings.











Weather

Turbulence

Storms and Lightning

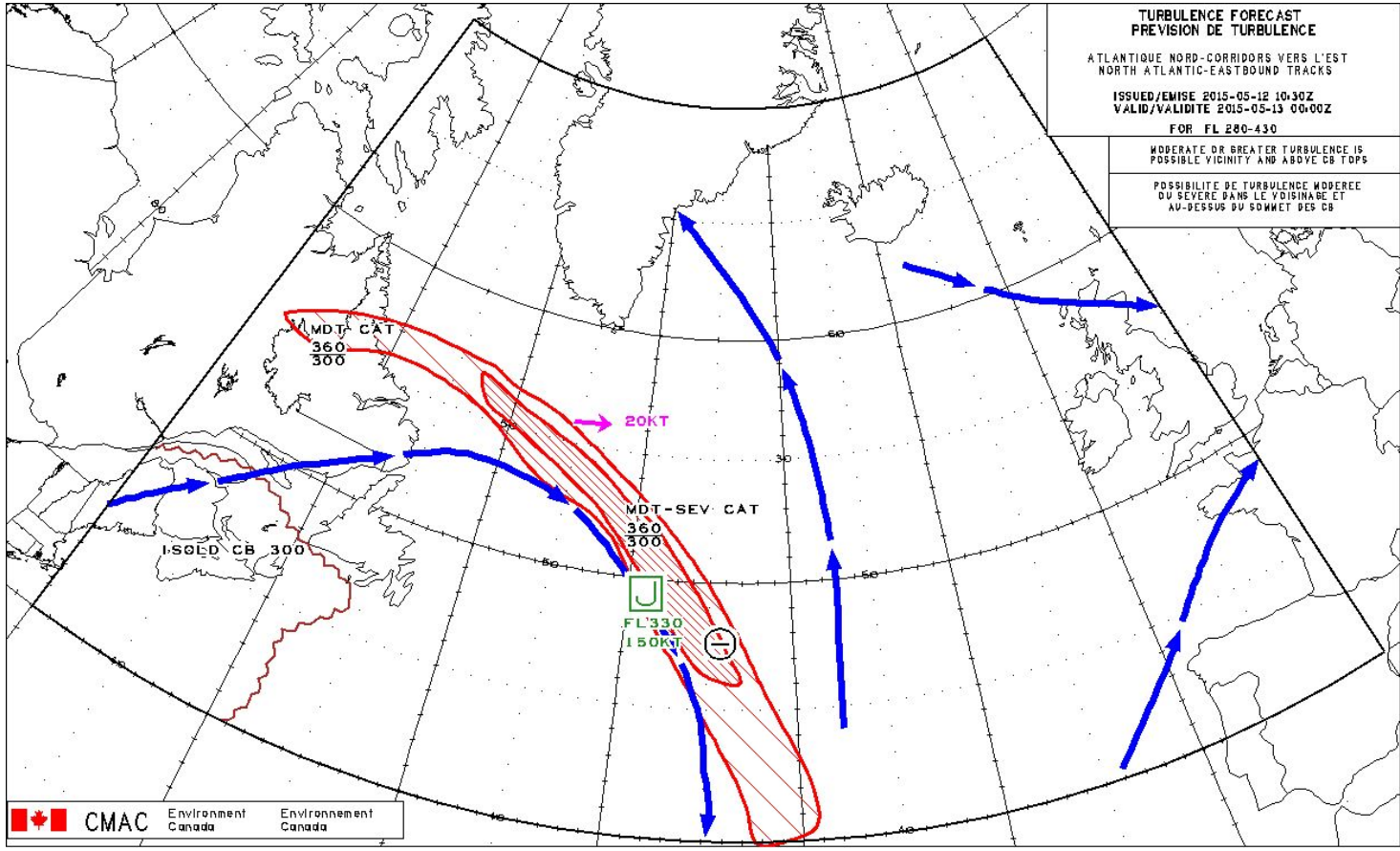
Icing

Turbulence

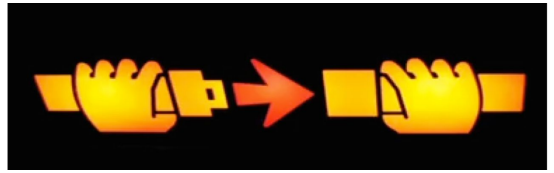
Where does turbulence come from? We will see two types, and how they originate.

- **Clear Air Turbulence**

- **Associated with clouds**

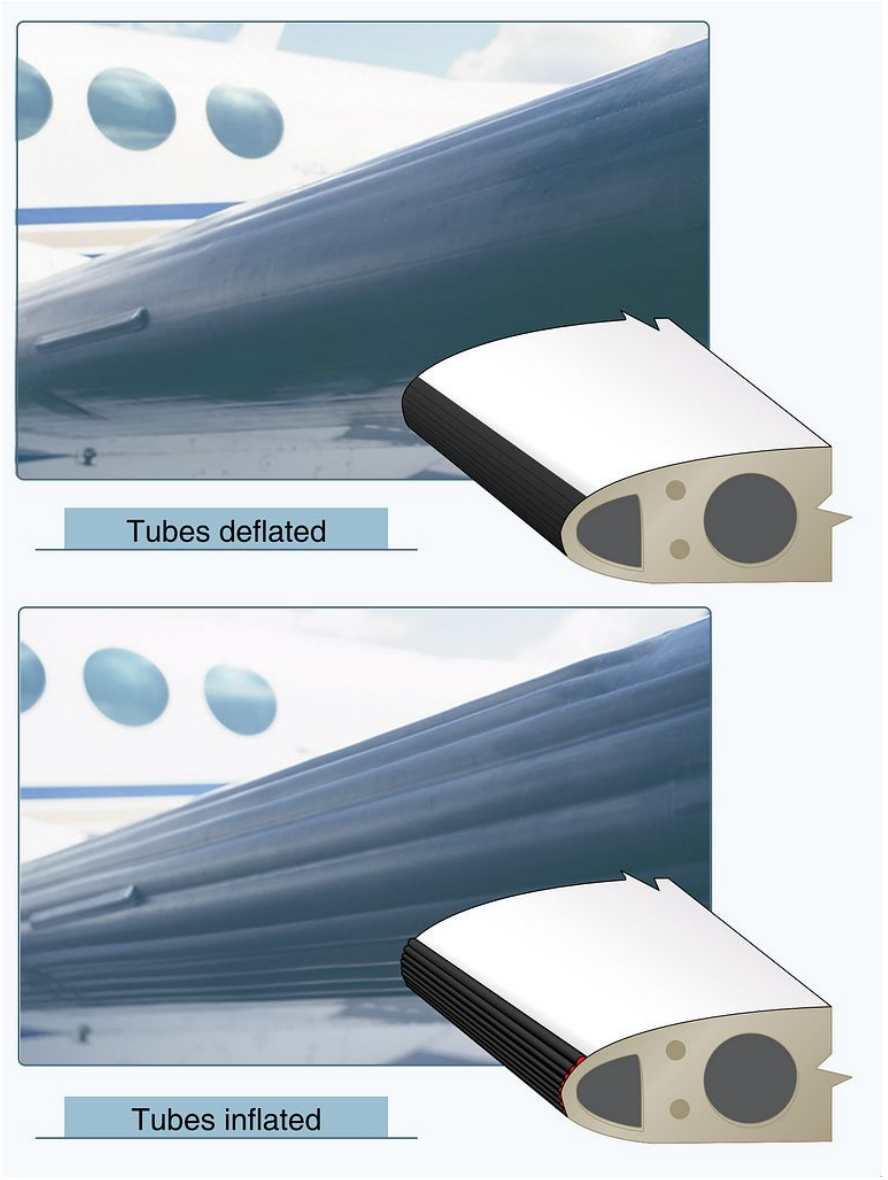


Turbulence



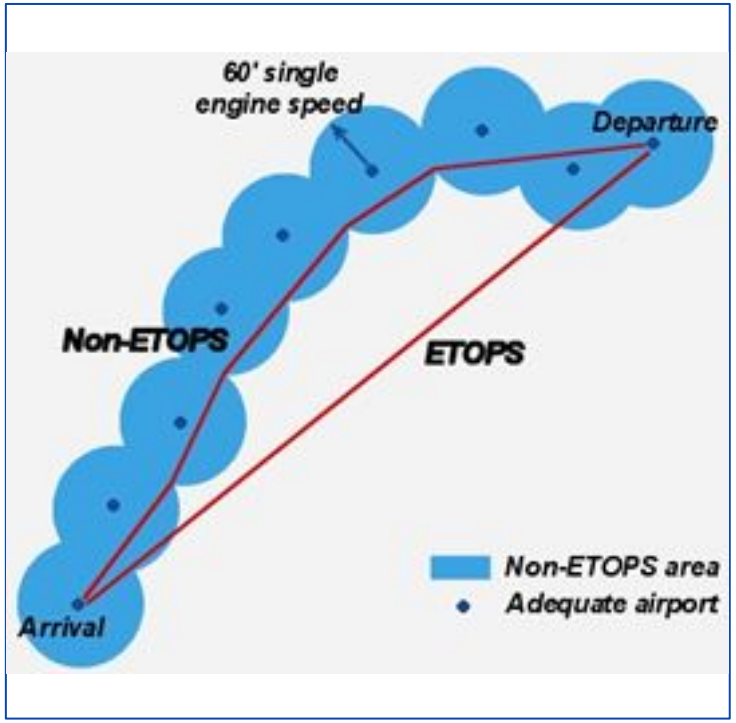

Lightning

Icing

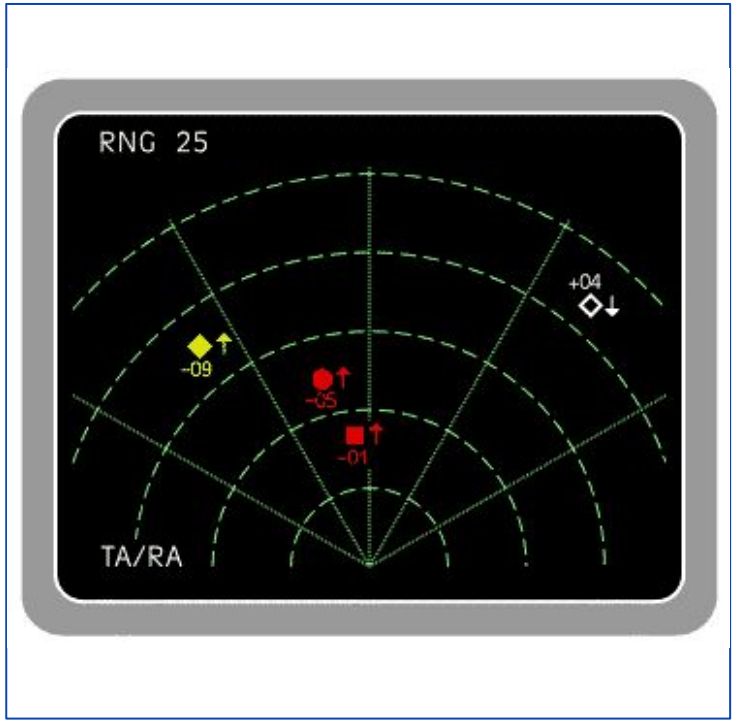


Failures

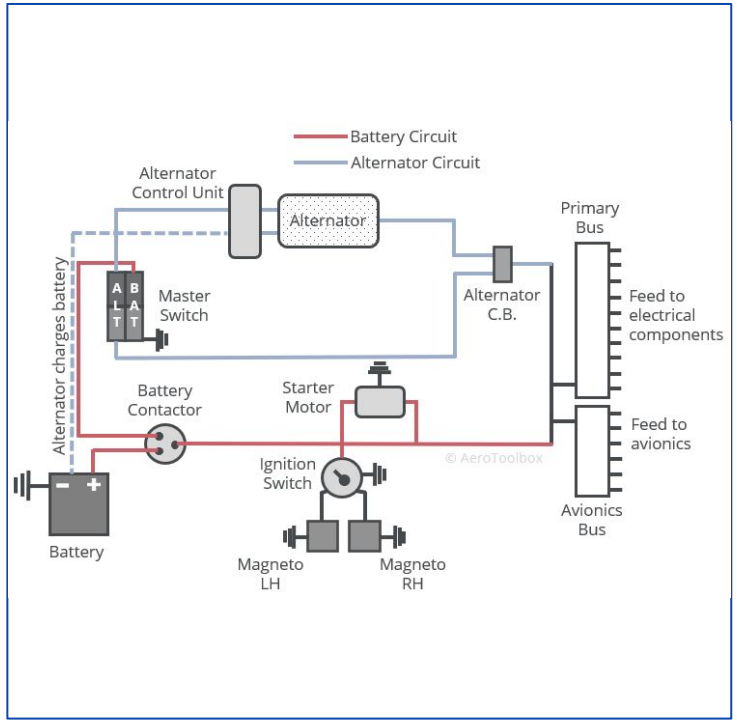
ETOPS



Mid-air collision



Electrical failure



ETOPS

Pilots are quick to react in the eventuality of an engine failure thanks to the memory items.

Twin engine airplanes have more than often more power than necessary (overpowered). Hence, in case of an engine failure, one engine is more than enough to assure a safe flight to an alternate airport.

Engine Fire

The engine will be shut down by the crew and they will follow a checklist to verify all systems potentially affected by the associated failure and make sure that the reminder systems work.

Depressurization

Oxygen masks have a capacity of 15 to 20 minutes per passenger. Pilots have a separate system of oxygen for redundancy.

Mid-air collision

Traffic nearby
No altitude information

Traffic nearby
1100ft higher and descending

Traffic Advisory (TA)
900ft lower cruising

Resolution Advisory (RA)
500ft lower and climbing
Requires immediate action

Electrical failures

Hijacking Attempts

What actions are taken by the flight crew to avoid hijackings?

- Emergency descent to avoid an explosive depressurization
- Control the unruly passenger
- Emergency landing in order for the competent authority to arrest the passenger and search the aircraft

Congratulations!

Congratulations!

Now you have the knowledge required for a demonstration flight!

Have a Great Flight!

AviaSim