



SUMMARY

This course covers the physiological, aerodynamic, and environmental hazards associated with high altitude flight, including:

- The composition, circulation, and properties of the Earth's atmosphere.
- High altitude aerodynamics and the dangers associated.
- Environmental factors specific to high altitude flight, including jet stream winds, clear air turbulence, thunderstorms, icing, low ambient temperatures, volcanic ash, and wake turbulence.
- Aircraft pressurization and oxygen systems.
- High altitude physiology including hypoxia, hyperventilation, decompression sickness, barotrauma, and the effects of cosmic radiation.
- Abnormal and emergency procedures relating to gradual decompression, rapid decompression, and emergency descent.
- High altitude accident case study

TARGET POPULATION

The Pelesys High Altitude Training course is designed to provide initial and recurrent training for flight crew and cabin crew operating pressurized aircraft above 10,000 feet MSL. It is a required element (ICAO, CARs, FARs, JARs) for all crewmembers operating or working onboard airplanes at high altitudes.

REGULATORY COMPLIANCE

- ICAO / EASA / FAA / Transport Canada
- Maintain compliance with IOSA standard

Versions Available:
Standard

Course Length:
2 hr 10 min

LESSON 01: The Atmosphere

In this lesson we will cover:

- Atmospheric pressure
- Standard pressure
- Pressure lapse rate
- Troposphere, Stratosphere and Mesosphere
- Thermosphere and Exosphere
- Intertropical Convergence Zone (ITCZ)
- Coriolis effect
- Jet stream structure
- Subtropical jet streams
- Polar jet streams

LESSON 02: High Altitude Aerodynamics

In this lesson we will cover:

- Aerodynamic considerations for airframes and engines
- Thrust Specific Fuel Consumption (TSFC) considerations
- L/D max
- Cruise speed considerations
- Endurance speed
- Buffet margins
- Buffet onset
- Optimum cruise altitudes
- Maximum cruise altitudes (buffet / thrust considerations)
- Temperature gradients
- High altitude stalls and recovery
- Dutch roll
- Yaw damping

LESSON 03: High Altitude Environmental Factors

In this lesson we will cover:

- Environmental threats
- Temperatures aloft
- Clear Air Turbulence (CAT)
- CAT avoidance
- Mountain wave effects
- Thunderstorm avoidance
- Engine and airframe icing
- Fuel temperature management
- Volcanic ash – detection / avoidance
- Wake turbulence

LESSON 04: High Altitude Aircraft Systems

In this lesson we will cover:

- Pressurization systems operation
- Air conditioning
- Crew oxygen systems
- Passenger and portable oxygen systems

LESSON 05: High Altitude Physiology

In this lesson we will cover:

- Respiration
- Hypoxia types
- Hypoxia symptoms
- Time of useful consciousness
- Decompression
- Hyperventilation
- Oxygen paradox
- Dysbarism
- Decompression sickness
- Barotrauma and internal effects
- Cosmic radiation

LESSON 06: Emergency Procedures / Accident Scenarios

In this lesson we will cover:

- Loss of pressurization
- Cabin volume
- Failure detection
- Time of useful consciousness
- Oxygen masks
- Emergency descent profiles
- Emergency descent considerations
- Case study – Helios 522

LEARNING TIME AND RUN TIME

This course has a learning time of: (run time plus additional time per page to account for understanding learning points)

- 2 hr 10 min (Airbus / Boeing)

This course has a run time of: (the base time for each page to be completed)

- 1 hr 20 min (Airbus / Boeing)

Exam Generation System (EGS) Banked Questions

The total amount of banked questions for this course is:

Lesson Title	Standard Questions
The Atmosphere	10
High Altitude Aerodynamics	9
High Altitude Environmental Factors	10
High Altitude Aircraft Systems	5
High Altitude Physiology	8
Emergency Procedures / Accident Scenario	6
	48

REFERENCE MATERIAL

The Pelesys High Altitude Operations Course provides information to pilots and dispatcher regarding operations at altitudes above Flight Level 250. It may be used in conjunction with the PBN, NAT Operations, and Aircraft Upset Prevention and Recovery Training Courses. This course is based on information contained in:

EASA:

- EASA Safety Information System Flight at High Altitude in Adverse Conditions
- EASA Flight at high altitude in adverse conditions - EU Training system
- EASA Flight at High Altitude in Adverse Conditions - Flight Aspects
- EASA Flight at High Altitude in Adverse Conditions - Data Analysis

FAA:

- AC 61-107A/B - Operations of Aircraft at Altitudes Above 25,000 Feet MSL and/or Mach Numbers (MMO) Greater Than .75
- 14 CFR part 61 section 61.31(g).
- 14 CFR section 91.211
- 14 CFR section 91.215
- 14 CFR section 91.121
- DOT/FAAMM-91/13 - Civilian Training in High-Altitude Flight Physiology
- FAA Aviation Physiology
- FAA Safety - Density Altitude
- FAA Aircraft Performance
- Airplane Flying Handbook, FAA-H-8083-3

ICAO:

- ICAO Doc 7192 - Training Manual Part F1 - Meteorology for Air Traffic Controllers and Pilots
- ICAO Doc 10011 Manual on Aeroplane Upset Prevention and Recovery Training
- Airplane Upset Prevention and Recovery Training Aid Rev 3

TC:

- CASS 725.124 (29) - High Altitude Training
- TP 14371 Airman's Information Manual

The operator remains responsible for obtaining approval from the regulatory authority.

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