Air Transport Management and Technology:
10. Air Transport Infrastructure

Methodological concept to effectively support technical key competencies using foreign languages ATCZ62 – the CLIL as a university teaching strategy

Air Transport Infrastructure

Aircraft infrastructure includes buildings, objects and facilities that have a direct impact on the organization and management of air traffic in the airspace or on the ground, or allow the movement or servicing of aircraft on airports. It is possible to divide the infrastructure into three parts:

- Airspace is an 3D space above the territory of the State to a height that can be used for air traffic. Airspace is open to flying under the conditions laid down by the laws of each state and international treaties ensuring flight rules which lay down procedures for moving in the airspace.

- Airport consisting of a territorially defined and suitably adapted area, including buildings and facilities permanently destined for take-off and landing of aircraft and aircraft movements related thereto.

- Air services to ensure the security and continuity of flights in the airspace of each states.

Airport - classification

In the Czech Republic, airports are divided into the following categories:

a) according to technical conditions, operating conditions and basic purpose:

- **Domestic airports** - are intended and equipped to carry out domestic flights only (within one state);
- **International airports** - are designed and equipped not only for domestic flights but also for flights crossing the state border of the state - they are equipped with passport, customs, health and other controls.

b) According to the group of users:

- **Public** - an airport which can accept all aircraft by its operational capability;
- **Non-public** - airports for which the user group is designated by operators proposal;
- **Military** – Airports that serve only for the army needs.

c) According to the nature of the air traffic at the airport:

- For example transport airport, sports airport, corporate airport, experimental airport, for agricultural purposes and others.

Airport – Movement areas

Movement areas are asphalt or concrete (most common) surfaces for the movements of aircrafts. We can divide them into:

➢ **Runway (RWY)** - defined rectangular area on a land aerodrome prepared for the landing and takeoff of aircrafts.

➢ **Taxiway (TWY)** – path for aircraft at an airport connecting runways with aprons, hangars, terminals and other facilities.

➢ **Apron (APN)** – The area near the terminal and hangar equipped with aircraft stands for carrying out aircraft handling, loading and unloading goods, embarkation and disembarkation of passengers, etc.
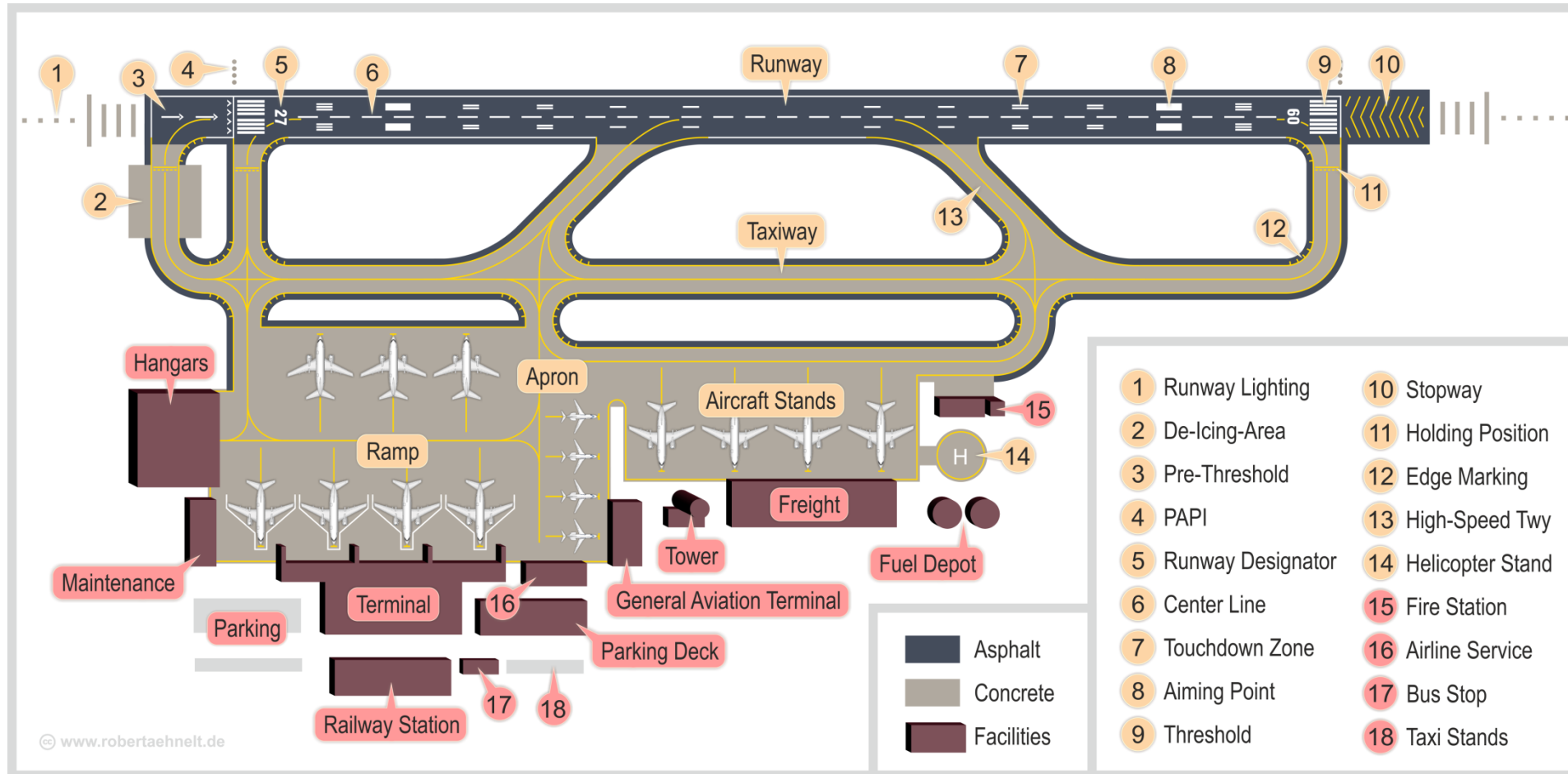
Runway (RWY) can be divided into categories:

• **Non-instrument RWY -** intended for the operation of aircraft using visual approach procedures (VFR).

• **Instrument RWY –** intended for the operation of aircraft using instrument flight rules (IFR) – instrument approach procedures.

Airport - operating facilities

In addition to the technical facilities for organizing air traffic (especially in the phase when an airplane approaches the RWY), airport visual and navigational aids are available at the airport, which at the same time allow operation of air traffic at reduced visibility at airports:

- Indicators and signals (for example Wind Direction Indicator);

- Marking on movement areas (for example threshold, distance or axial marks on the runway);

- Lighting systems (instrument RWY only):

  - **Approach lighting systems** - For visual guidance of the aircraft onto the RWY;

  - **Precision approach lighting systems** - provides guidance information to help a pilot acquire and maintain the correct approach (in the vertical level) to an airport (for example PAPI system);

  - **RWY lighting systems** - Lighting defines for example the boundaries or RWY center line.

Transport airport Infrastructure

Airport terminals

Airport terminal is a building at an airport where passengers transfer between ground transportation and the facilities that allow them to board and disembark from aircraft. Within the terminal, passengers purchase tickets, transfer their luggage, and go through security.

The division of the terminal parts into:

- **Departure** and **arrival section**

- **Pre - security section**– The public part of the terminal where the free movement of persons is allowed

- **Post security section** – Non-public part of the terminal with areas for the movement of persons who have passed check-in, customs, security and passport control.

Air Traffic Control

Air Traffic Control (ATC) is a service provided by ground facilities to aircrafts in a controlled airspace or a controlled airport. The basic purpose of air traffic control is to prevent collisions in the air and on the ground, but air traffic controllers usually provide pilots with other services such as navigation assistance or information services. The air traffic control service is usually provided by three mutually cooperating specialized centers:

Tower control (TWR) - Controllers in the tower are responsible for safe traffic operation on the runway, taxiways and in a Controlled Zone (CTR), which is an airspace in the immediate vicinity of the airport.

Approach control (APP) - Its mission is to maintain safe and continuous air traffic in the terminal-controlled area, which is the airspace in the wider area of the airport.

Area Control Centre (ACC) - Provides air traffic control in the respective controlled area, typically a large area of controlled airspace, sometimes covering the whole of the country.

Airspace

We recognize two basic types of airspace in terms of movement within it (i.e. flying):

- Controlled airspace;

- Uncontrolled airspace.

In the context of air transport, airspace is further divided into different areas, segments, banned areas, temporarily reserved areas, etc., defining the airborne air route.

The flights themselves are coordinated by dispatchers of **Air Traffic Control** (ATC), who supervise, inter alia, **the vertical and horizontal spacing** between individual aircraft in controlled airspace.