

RECREATIONAL AND SPORT FLYING IN THE CONTEXT OF THE PROTECTION AND DEVELOPMENT OF THE NATURAL LANDSCAPE

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Abstract

Civil aviation is generally perceived as an area of human activity that places an extreme burden on the environment. This statement is often published without further explanation of the reasons leading to this clear conclusion. On closer analysis, it can be concluded that aviation has a general adverse impact on the environment, but so do many other human activities. If we were to look at aviation in more detail, we would find that it has been trying to reduce its environmental impact continuously since the second half of the last century. Whether it is in the form of procedures and technical solutions to reduce fuel consumption, or in reducing emissions, noise pollution, etc. In a number of areas (e.g. general aviation), it can contribute to the preservation and protection of the natural landscape (fauna and flora) by forming a natural barrier to the impact of other human activities in the area (road construction, urbanisation, etc.).

Keywords: aerodrome, aviation, land grabbing, recreation

Introduction

Civil aviation means aeronautical activities operated by civil aircraft of any nationality for civil purposes. Under this definition we can imagine all activities in which aircraft are used - from passenger transport, aerobatics, sightseeing flights to drone flights. All these aeronautical activities take place in the airspace of a given State, which according to the legislation extends to the altitude that can be used for flight operations, which in practice represents flight levels up to 10-15km.

Unfortunately, the vast majority of categories of aircraft operations have a not inconsiderable negative impact on the environment in which aircraft, as well as other technical means and man himself, move.

Materials and methods

The negative impact of air traffic on the environment is most often documented through the emissions produced (carbon dioxide CO₂, carbon monoxide CO, nitrogen oxides NO_x - NO, N₂O, sulphur dioxide SO₂, hydrocarbons HC, particulate matter PM and others). Another undesirable effect is noise (both external and internal) or the associated vibrations.

As with other modes of transport, there are standards governing and regulating the production of harmful substances or noise generation.

See Table 1 for a comparison of the emissions production of each mode of transport in the Czech Republic for the calendar year 2022. The table shows that air transport alone does not represent a major environmental burden, although the values do not take into account, for example, the number of passengers transported, the distance, etc. The nature of traffic also differs from one transport to another (e.g. water transport is limited to about 600 km of navigable streams in the Czech Republic, air transport is largely burdened by transit traffic, etc.).

Tab. 1: Comparison of CO₂ emissions (<https://www.sydos.cz>)

Type of transport	CO ₂ [thous.t]	CO [t]	NO _x [t]	N ₂ O [t]	Volatile organic substances [t]	Particulate matter [t]
Road transport	20 032	61 981	47 923	658	11 578	4 207
Rail transport	227	1099	3 935	1,9	370	128
Water transport	10	59	102	0,3	14	7,9
Air transport	819	2673	3 694	22	195	46

In normal operation, the subject of public criticism is mainly noise, for which limit values are set (see Table 2).

Tab. 2: Hygienic limits for traffic noise in front of the façade of residential rooms (Government Regulation No. 272/2011)

Noise source	Hygienic noise limit LAeq,T [dB]	
	6 – 22 h	22 – 6 h
Ground communications	55	45
Main roads	60	50
Traffic on railways	55	50
Air traffic	60	50

However, the biggest environmental burden is the operation of international air transport. If we look at operations in the GA / or recreational and sport aviation segment, this negative impact is much smaller. In addition, the operation of these categories in turn also has a positive impact on the preservation and often protection of a given part of the landscape in the immediate vicinity of these aerodromes.

General aviation GA is the term for all civil aviation operations that are not scheduled, non-scheduled (e.g. charter) or military. General aviation flights therefore include flights of gliders, powered parachutes, small aircraft (ultralights) or business jets. Most of the world's air traffic falls into this category, with most airports accepting only general aviation flights. A wide range of activities fall under this category, whether commercial such as flight schools, agricultural aviation or non-commercial such as recreational flights with smaller aircraft.

Also commonly included in this category are so-called sport flying devices (SFD), which, according to the Czech Civil Aviation Act No 49/1997 Coll., are maximum two-seater aircraft or sport parachutes intended to be flown for personal use or for the use of others, for the purpose of recreation, individual personal transport, sport or pilot training with maximum take off mass 450 (resp. 650) kg.

Under the Act No. 49/1997 Coll. on Civil Aviation § 81, sport flying devices include, but are not limited to:

- an ultralight glider
- an ultralight aeroplane
- powered hang glider
- ultralight helicopter
- an ultralight motorized whirlwind
- powered paraglider
- hang glider
- paraglider
- sport paraglider

In addition to airfields, sport flying devices may also use areas designated for SFDs (often also referred to as airfields) for takeoffs and landings during regular operations, under the Act No. 49/1997 Coll. on Civil Aviation § 84d.

The management of SFDs falls under the competence of the Light Aircraft Association of the Czech Republic by decision of the Ministry of Transport.

The operation of GA/sport and recreational flying is primarily aimed at flight training and at meeting the personal needs of individuals, including leisure activities. Various competitions in aeronautical navigation, precision flying and air rally competitions are also held within this operation. Precision flying and aerial rally competitions, also known as navigation competitions, are designed with knowledge of the surrounding countryside in mind, so that crews are forced to familiarise themselves with the nature of the landscape and geographical features. In a navigation flight, the pilot, who is alone on board, must fly a set course and keep time to within ± 2 seconds. He must also search the ground for the features of the objects, e.g. from photographs he has received before take-off.

The operating characteristics of these categories are focused not only on powered flying, but also to a large extent on so-called nonpowered flying (operation of gliders and gliders, paragliders, etc.), which does not burden the environment in terms of emissions and noise.

All types of aviation activities in the GA / sport and recreational flying category are essentially based on a perfect symbiosis between man and the landscape in which he intends to be active.

The priority of civil aviation is safety, both of the crew and of others, for which the pilot in command is responsible. This presupposes not only perfect knowledge of the environment, but also of meteorological phenomena and climatic conditions, which can be a decisive factor in the safe planning and subsequent execution of a flight.

Land Grabbing

Another negative often presented in transport in general is land take, which is defined as an irreversible process that reduces or completely removes the original function of land. Land take involves transport vehicles, the transport network and transport infrastructure, i.e. roads, railways, airports, ports, garages, depots, bus and rail stations, fuel stations, repair shops, etc. In the case of aviation, however, this statement can be applied without reservation only to the category of international air transport, whereas in the case of the segment referred to as general aviation or sport and recreational flying, we could argue about land grabbing within the limits of the above definition. GA/sport and recreational flying is predominantly carried out from small airports designed for the operation of smaller aircraft types, equipped with unpaved runways (RWY) with grass surfaces. Land take in these cases is limited to only part of the facilities such as hangars, administrative buildings, etc.

Discussion

There are currently 91 aerodromes in the Czech Republic, of which only 6 are public international airports primarily used for air transport of passengers and cargo. The remaining aerodromes are used for general aviation or for sport and recreational flying and in the vast majority of cases they are aerodromes equipped only with unpaved runways with grass surfaces. These airfields account for only a negligible part of the total area of the airport. If we consider as an average size of an airport (in GA category) an area of about 20-30 ha, then the technical facilities alone occupy 5-10% of the total area. From the above it follows that about 90% of the airport area is of a natural character (grassy area) not significantly disturbing the surrounding natural landscape. In addition to the basic delimitation of the aerodrome, there are also so-called protection areas and obstacle planes (especially in the direction of take-off and landing) around the runway system, in order to ensure the safety of air traffic, which has, among other things, the impact that no obstacles (especially buildings, etc.) may be established in the vicinity of the aerodrome. The airports themselves, have historically been established in locations suitable for air traffic (meadows, grass strips), without the need for extensive construction or landscaping. As a result, today these small ('aeroclub') airfields represent an important element in the protection of the original landscape character, as they have in the past prevented, and often still prevent, the encroachment of land for industrial or urban development. They often form an important landscape feature as a natural habitat for rarer plant and animal species.

The fact that these airfields are a popular habitat for various species of wildlife (insects, birds, rodents, game, etc.), both as a source of food (especially at night) and as a natural long-term habitat, also contributes to this. These are often protected species (e.g. the common gopher) that find a natural landscape character for their existence in the aerodrome area. As a result, nature reserves, nature monuments, bio-corridors, etc. have been established in the areas of many airports.

The operation of the airport is naturally also focused on the protection and maintenance of the individual areas, which primarily focuses on the regular mowing of grass areas or their restoration.

The nature of the operation of these airports also contributes to this, with 90% of the traffic concentrated on weekend days and the remainder unevenly spread over the days of the working week.

Due to their nature, the area of these airports is also an attractive location for the general public to engage in leisure activities (running, cycling, hiking, etc.), as the airport premises are often freely accessible (subject to safety rules).

As they are in relative proximity to human settlements, they also fulfil other functions - they are often a place to discover living and non-living nature, they can serve as a place of peace and relaxation at an accessible distance from the urban landscape, etc.



Fig. 1: Area and surroundings of a small sports aerodrome

Conclusion

In conclusion, although civil aviation is perceived as a negative element that negatively affects the quality of the environment, this view may not be entirely unambiguous and, on the contrary, after a more detailed acquaintance with the functioning of the individual areas of aviation, it is possible to find positive contributions to the positive development and preservation of the cultural landscape.

References

Act No. 49/1997 Coll., on Civil Aviation, § 81.

Act No. 49/1997 Coll., on Civil Aviation, § 84d

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Government Regulation No. 272/2011 - Government Regulation on the protection of health against the adverse effects of noise and vibration

Souhrn

Civilní letectví je obecně chápáno jako oblast lidské činnosti extrémně zatěžující životní prostředí. Toto konstatování je často publikováno bez bližšího objasnění důvodů vedoucích k tomuto jednoznačnému závěru. Při bližším rozboru můžeme konstatovat, že letectví v obecné rovině nepříznivě působí na životní prostředí, avšak stejně jako řada jiných činností člověka. Pokud bychom se zabývali letectvím podrobněji, tak bychom zjistili, že se snaží snižovat míru zátěže na životní prostředí kontinuálně od druhé poloviny minulého století. Ať jsou to již postupy a technická řešení pro snižování spotřeby paliva, nebo snižování emisí, hlukové zátěže aj. V řadě oblastí (např. všeobecného letectví), pak může přispívat k zachování a ochraně přirozeného rázu krajiny (fauny i fóry), díky tomu, že tvoří přirozenou bariéru působení jiných oblastí činnosti člověka v dané lokalitě (výstavba komunikací, urbanizace apod.).

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