

# OPTIONS TO REDUCE ENVIRONMENTAL BURDENS AT VODOCHODY AIRPORT

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The aim of the thesis was to propose ways how to reduce the environmental burden of Prague Vodochody Airport. The issue is dealt with in the chapters related to the topic. The first chapter is devoted to the impact of aviation on the ecology and the environment in general. The second chapter is a brief description of Prague Vodochody airport. The main part of the work is the third and the fourth chapter, which focuses on the analysis of the current state of environmental burden Vodochody Airport and characterization of the environmental risks for potential emergency and nonstandard situations. In conclusion, options are proposed to reduce the environmental burden of Vodochody Airport.

**K e y w o r d s:** airport, airport Vodochody, airport environmental burden, noise from air traffic, emissions from aviation, hazardous substances at the airport

## 1 INTRODUCTION

Demands for the environmental prevention, when talking about airports, are one of the most challenging issues due to its financial and personal background. However, there exists a determination toward the airport requirements. The airport within its functionality are obviously the resource for an environmental threat, e.g. noise level, air emissions commonly led against the subsurface water fouling, likewise the polluting within its area. We also recognise crisis or public threats which are potential menace to the environment. One of the most common threat is definitely the noise level. Unfortunately, this ordinary situation is reflected by airlines due to the offered services and it's not possible to cast out it at all. The matter, we can stand for shall be the elimination of this aspect.

## 2 PRAGUE VODOCHODY AIRPORT

AERO Vodochody is a joint stock corporation (Inc.) registered on January 2<sup>nd</sup> 2006. The main stockholder up to the end of 2006 was Czech Consolidation Agency (ČKA). By January 4<sup>th</sup> 2007 the operative stockholder is held by the private equity, Penta. [1]

The AERO Vodochody Inc. announced the development intention in 2007, which included international premises enhancement with the external bordering. The investor asked for the marketing study before execution as to which opportunities of the airport had been considered. Related to the study, the investor turned over the screening of some expected airport operation research under the effect of the noise level to the surroundings. Alternatively, they were about 47 950 flights per year, which was the largest amount of flights handled. In fact, the number exceeded the governmental regulations adjusting limited Noise Contours to the settled territory. Accordingly the investor found out the alternative of set up which is in conclusion legal.

Other documentation, moreover announcement followed up the lawful and more economical likewise environmental-friendly option with about 35 000 flights

handled per year. That subject worked out on a high-level of the design documentation.

The Czech Ministry of Environment obtained the documentation on October 2010, dealing with eco-impact, processed in accordance to Annex No. 4, Act No.100/2001 Coll. on Environmental Impact Assessment. Suggestions, comments and references containing information requests need to be completed had been enclosed.

The Ministry of Environment decided to amend the documentation by the official letter ex February 1<sup>st</sup> 2011 under authority of EIA process evaluation and executor's testimonial. The Ministry determined the objector appraisal for processing post hoc September 2011 when the investor provided the full EIA documentation.

Once the process is accomplished, there is a public marking up and hearing established. [2]

The Diploma thesis assigns the analysis of the applied load in the environmental situation presently at the Prague Vodochody Airport. It also refers to the threat definition by potential accidents or unexpected situations with the opportunity to environmental applied load reduction.

### 2.1 Noise Level and Air Pollution

When summarizing Vodochody Airport force to the public health, we considered the technicalities regarding the noise implication, air pollution, transport toxic substances and the methodology of health risk evaluation.

Based on outputs of dispersal and acoustic studies we noticed the emission and noise exposition of population in the service area nearby the airport. Resulting the consequences, we know the airport operation to the atmosphere quality in its operational area is lightly considerable. It doesn't exist significant health effect of noise exposition within the aviation and related ground transport.

The featured impact we can recognise inside the psychological and social field of the nature of annoyance by noise into the static surroundings by now.

Technicalities regarding the noise implication, air pollution, as mentioned above were considered under authority of the World Health Organization and its base points, either taken out from the scientific institutions of the European Union.

We rated the exposition by diffused study outputs, by emission amounts set by Czech Hydrometeorological Institute (ČHMÚ) and either by clinic atmosphere-quality measurements. There are some ordinary injurants made by transportation, which were taken into the account with elusive organic compounds. All of those were calculated and we know the benzoine, formalin, ethanal and 1,3-butadiene following the health signification included potential carcinogenity.

We understand, the dust-particle (suspended elements of  $PM_{10}$  fraction) are the most considerable injurant in the service area, i.e. the part where the possibility of immission runover is made. The benzene has a documented carcinogenic response and its consequence to the service area does not run over the safety margin, which was calculated by diffused study.

The same we can evaluate for other dust-particles of emission regardless of the existing emission level, alike the additive action of the injurants. [3]

As mentioned above, the outcomes are relevant to the monitoring of the atmosphere quality in the airport environment, as figured out there is no difference between the air quality within the airport environment and the environment conditions in the surroundings with the ground transportation.

## 2.2 Dangerous substance manipulation, its risks and environmental threats

The qualitative and quantitative method was used when preparing the risk testimonial of the dangerous substance presence at the Vodochody Airport.

The law regulation of dangerous substances given by the Czech Act. No. 59/2006 Coll. is the leading document for the case study. By this law, intended amount of dangerous substances will be less than there are minimum amounts of these substances, which are critical for the A or B group classification.

There is a law formula called „Non-classification Certificate“, by § 4 of the Act which must be executed. In purport of all above questioned, there is not a certain restriction within the environmental threat of the Vodochody Airport expansion as much as the security program included the significant accident prevention should be launched.

The selective analysis said, it is not necessary to prepare the quantitative analysis due to the fact, there is not any planned risk source considered as authoritative. The possible equipment is expressly not a hazard for the population and service area of the airport.

By the method Rapid Ranking within the analysis we understand, risk sources are set up in the

lowest fire danger (explosion) and toxic menace category at the questioned place. These dangers are as obvious as dangers occurred when manipulating with the inflammable substances.

Airport infrastructure expansion will not be considered as the authoritative contingency of the territory population in term of collisions or abnormal system behaviour. In fact, potential dangerous substances are raw oil product, therefore the safety is required – maintenance, controlling, etc.

Ground water safety will be determined by the Czech law regulations, Act. No. 254/2001 Coll. on Waters and Amendments to some acts (the Water Act) by minimising of dangerous substances elusion, which will be done thru the technical and structural solutions. [4]

## 3 CONCLUSION

There are noise levels acceptable by carrying-capacity of questioned area in term of admissible health consequences of the population, either by the law regulations set by public health act. The major supervising member is in charge with these performance appraisals. The aim is get on stability within law regulations keeping, public health and achievable estate, while the full safety and amenity of population cannot be guaranteed.

Diffused study outputs are relevant to the knowledge out of the air quality monitoring within the areas of large European airports. It is not known there exists some of toxic or carcinogenic substances which are directly connected to the aviation. Health Evaluation Board in Netherlands was in charge with comprehensive evaluation of large airports attacks in 1999. In conclusion it says, there is not a connection between atmosphere pollution within the airport areas and special risk compared to other urban areas.

The topic of environmental threats caused by accidents and abnormal systems behaviour is widespread. Accordingly, there are some scenarios of accidents (the initiatory can be jet fuel leak out of the elevated bin), either some aircraft crashes into the settled areas and their risk evaluation, or airports situated close to the factories (Area of Chemical Works in Kralupy and evaluation of the interaction between its liquid gas storage with the ball pivots and the Vodochody Airport), which should be a diploma thesis.

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