

# Innovation and development of air transport in Slovakia

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**Abstract**— *This contribution is theory disassemble potential, innovation and development of air transport in Slovakia. The paper deals with the possibilities of aviation production in Slovakia that has currently been going through recession mainly caused by dynamic changes in aviation infrastructure in the country. Rapid development of new technologies in aviation reflects continual pressure on producers of aircrafts and aircraft components in Slovakia aiming to succeed with the production not only in the country but in the world as well. On the contrary, it all is conditioned by complicated legislation that is reflected in the insecurity of the Slovak aviation industry.*

**Keywords**— *Potential, effectivity, aviation technology, production of aircrafts, aviation.*

## I. INTRODUCTION

Slovakia's aerospace sector, as a part of the aerospace and defence (A&D) sector, must be seen in context of both Europe and the entire world. This sector always includes both civil and defence/military elements. On the civil side this sector and its market is cyclical depending on the acquisition plans of airlines, which fluctuate considerably, especially in a period of uncertain economic expectations and global security concerns. On the defence side, demand depends on the defence budgets and procurement policies of governments, which in turn depend on geopolitical developments and the changing perception of threats.[3]

The main trends and the position of the sector should be understood in the context of the following aspects.[3]

Disunity in aviation legislation and the competition within the category of ultralight aircrafts („ULA“) production in surrounding states causes producers of aviation technology significant problems. The advantage is high individual strong-mindedness of such producers to conquer the difficulties. That is why they have been looking for opportunities on such aviation market where they are currently able to find the customer base for their products also in abroad.

Aviation production potential of Slovakia used to have a long tradition during the epoch of the Czecho-Slovak Republic despite the fact it found its way in the production of aircraft components and supportive logistics. In the domain of aviation, Slovakia used to be respected industrial country with advanced development base. For example, development and production of aircraft engines in Považská Bystrica used to be one of the top ones in the world. In present, after having separated the industry of the former republic and because of the impact of the world-wide economical depression the possibilities of demand in aviation have been limited. In the last decade, many companies have been trying to restructure their production because while operating as assistance producers in favour of foreign aviation producers their share was insignificant.

In European aviation industry, Slovakia acts as a country making use of foreign support. Many Slovak aviation companies have been looking for investors that could be offered their advantages and professional man-power despite the competitive environment of surrounding states. Aviation industry is dependant on acquisition plans of aviation companies of which many have terminated (for example Sky Europe, Slovair) because of economic reasons. Reduction in aviation has recently been evident also in the army corps that consequently causes the increase in number of pilots and aviation professionals on the labour market.

Presently, aviation transport in Slovakia has found its way in acquirement of low cost air transporters with full operating support. Slovak aviation production specializes in the production of reliable smaller engine and motor less aircrafts (ULA aircrafts and sport aircrafts) and their components. Produced aircrafts are equipped by modern avionics and their production is on high-quality technological level.

## II. AIRCRAFT PRODUCTION IN SLOVAKIA

Economy laws apply within aviation industry in the same way as in other branches of industry. Especially security and stability in aviation industry determine tendency and ways to achieve high material and development level in aviation and

consequently by that also the attention of investors dealing with development of regional air transport and the production of ULA aircrafts to aviation.

As for the legislation in Slovakia, security standards are given by the Civil Aviation Authority of the Slovak Republic that by establishment of the regulations enables to apply progressive opportunities to ULA producers. Many types of aircrafts are certified more easily abroad than in the country and that is reflected in the attitude of many foreign investors.

In present, there are several ULA producers that directly produce aircrafts or unit components. These are such as:

- AEROSPOOL s.r.o., Prievidza – deals with production of sport aircrafts, type sailplane WT 3 and ULA aircrafts WT 9 Dynamic. The WT 9 Dynamic reaches high quality namely due to its advanced construction, precise hand-work and using the latest aviation materials. The vision of the company to the future is orientation to the production of four-seat aircraft and using the latest technologies.
- AEROPRO s.r.o., Nitra – produces ULA aircrafts EUROFOX 2K and 3K. The aircrafts are constructed as concora high-wing monoplane. Double-beam wing contains Junker's flap that functions as a flaperon. The fuselage is of truss construction made of steel tubes. The tail parts of the aircraft are made as a tube flat truss construction. The undercraft of EUROFOX-2K is classic with back stern wheel and as for the EUROFOX -3K, there is the undercraft of 3-wheels type operated by the front wheel.
- COMP-LET s.r.o., Senica – produces ULA aircraft type SHARK and deals with serial production of composite components for ultralight aircrafts.
- TOMARK s.r.o., Prešov – specializes in the production of Viper SD-4 ultralight aircraft that is highly appreciated for its equipment and its flying abilities. The aircraft is made for sport an recreational flying and uses modern display systems „Glass cockpit“.
- AVAMA s.r.o., Poprad – specializes in the production of ULA aircrafts type Stylux X2 and X3 which are unite-type and components for such an aircraft.

In Slovakia, there are other companies dealing with production of components for aircrafts and aviation. These are: DMD Group, a.s., Trenčín, KINEX – KLF a.s., Kysucké Nové Mesto, Way Industries a.s., Krupina, VRM a.s., Trenčín and Ales a.s., Trenčín.

### III. SLOVAK AVIATION ASSOCIATIONS

In the effort to prevent certain marginal discordances while trying to keep safety rules, producers of aviation technology also follow the programmes of other associations that are able to resolve their problems. Following associations can be mentioned:

- **The Slovak Federation of Ultralight Flying (SFUL)** – creates conditions for the development of recreational and sport flying by flying sport mechanisms, their safe utilization for personal need as well their development and construction. We can say the SFUL is the connection between administration, laws, regulations, restrictions and bans on one side and wish-to-fly subjects on the other side. It has been trying to eliminate restricting pressure on wish-to-fly subjects and so that favourable conditions for flying with lower costs and good feeling from recreational and sport flying be created. It is subordinated to the Civil Aviation Authority of the Slovak Republic.
- **Association of Aviation Producers of the Slovak Republic (ZLV SR)** – is independent, non-political and open professional organisation that joins legal and personal entities with the subject of enterprise within the production of aviation and space industry and other associated activities in the domain of army, civil and sport aviation industry or other legal and personal entity in connected domains with the seat in the Slovak Republic. By its effective activity it has been trying to enforce interests of the Slovak aviation industry and to gain support to establish conditions for its stabilization and further development on all the levels of management.

Work results of the organisations should be reflected in the support of creation national legislation that would effectively utilize international obligations and rights of the state, highly qualified and effective organisation that would act in civil aviation and that would make conditions in educational system and development in the favour of aviation development.

#### **IV. LEGISLATIVE AND PRODUCTION PROBLEMS IN PRODUCTION OF ULA AIRCRAFTS IN SLOVAKIA**

In present, the legislation in the production process of ULA aircrafts is subordinated to the EASA agency and that causes several problems. In present, aircraft producers are under pressure not only to respect criteria of exact procedures in production but also on the production of harmful emissions, noise and safety rules. Current legislation puts small producers under pressure to keep the same rules that must be kept when producing big transport aircrafts. That is why the statutory text of legislation laws for the production and certification of the ULA aircrafts is just a clear obstacle. Slovak producers try to fight the problem. Many documents and audit reports that double-check conformity of certifications of aircraft components producers used in certain type of ULA aircrafts are obstacle as well. [4]

Cooperation of auditors is difficult and not easy to overcome without economic impact on an aircraft producer and on the total price of aviation mechanism. When producing aircrafts in Slovakia, design system in flying and technology guidebooks for control and certification of produced aircrafts is poorly specified. Producers have to complete various guidebooks and respect another complicated legislation and that consequently increases the price of a produced aircraft.[1,4]

Every used component must be certified when used within an aircraft whether it is construction, dense or composite material. Aviation wiring material has probational-certified values that are given by their producers. Even in this case there may be discordancies when applying during the production of an aircraft.

Producers of aviation mechanisms in Slovakia positively appreciate knowledge ability of Slovak aviation specialists who apply in their companies. But in consideration of abovementioned limitations our aviation specialists look for options to self-full fill in surrounding countries mainly in the Czech Republic.[5]

The importance of ULA aircrafts production in Slovakia is supported by the fact, that there is quality labour potential that is able to overcome obstructions given to the Slovak producers. It is necessary to mention that disunity of legislation is also in Europe itself as the meaning of regulations for each EU country is individually adjusted by regional authorities in order to make it advantageous on the aviation market. (see the conditions for flying ULA aircraft in France) Many skilled professionals support the idea to conceptually resolve ambiguity in legislation according to the model of the USA legislation that is elaborated in detail and on high level.

#### **V. MARKET CONDITIONS, PRODUCTION AND PROMOTION OF ULA AIRCRAFTS**

Producers of ULA aircrafts in Slovakia are dependent on conditions of essential material components supply, wiring material and other components mainly from the countries where aviation industry is highly developed. That is why producers expect the same conditions when selling an aircraft as for the other competitive producers from other countries have. This ability to compete should be reflected in the presentation of final product – an aircraft – where quality level of the product is shown in compliance with its price. This is how the support of developed aviation countries is possible to be appreciated so that Slovakia finds respectable place on the international aviation market.[3]

Current governmental support of aviation research and development is significantly limited because economic base and efficiency of repayment time of invested money depends on unbelievable determination of individuals and torso of Slovak aviation educational institutions dealing with aviation studies and research. The possibility to improve this situation is to have higher amount of financial resources to develop national sport flying with the impact on development of good skills also in other aviation disciplines.

To prove competent, it is necessary for small producers of aviation technology in the country to look for the options to participate in European projects dealing with production of small and middle aircrafts within the territory of surrounding states. Of course, provided the quality production and using developed technologies. Presently, the dominant sales places are northern European countries and Germany, France, Belgium and England. Direction of the EU requires strict export licences issued by the country of origin that are nowadays very difficult to obtain.[5]

Promotion and presentation of Slovak aviation products are mainly done at various home and foreign workshops and public flying performances where they win admiration.

#### **VI. CONCLUSION**

Transition of the Slovak aviation industry to partial stagnation was influenced by many factors whether it was the historical background of the country, economic situation or dependency of our aviation on countries with developed aviation base. Support for development of aviation production must be oriented also towards further education to support and develop

education in technical and aviation branches as well as to the support of Slovak aviation associations and aero clubs where there is the very first contact of people with aviation technology. It is necessary to improve and look for compromise solutions in legislation so that there is no difference between our and other EU countries. Last but not least, it is necessary to preserve aviation traditions in production and reparation of aviation technology, in aviation research and education and in organizing various aviation events that end in not only verbal agreements but in concrete realisation team resolutions as well.

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