

## **Aerospace Research Centre in Brno University of Technology -goals, organisation and project activities**

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### **Introduction**

At the beginning of year 2000 Ministry of Education, Youth and Sports (MSMT) set a program named “Research Centres“ (RC). Aviation was represented by the project “Aerospace Research Centre” (ARC). Founding organisations are: Institute of Aerospace Engineering FME BUT in Brno as the project leading institution, Aeronautical Research and Test Institute, plc (VZLU) in Prague and Aerospace Division of Institute of Automotive & Aerospace Engineering FME CTU Prague as the co-leading institutions. Structure of the organisation is shown in Figure 1.

### **Goals of ARC project**

Basic goals and principles of the ARC project is to establish research centres as new element to support the science, research and development in the Czech Republic mainly in academic institutions.

The main goal in the **technical area** is the progress of chosen aviation disciplines and specialisation, from which many of them have deep impact to the line set in all economy of the Czech Republic.

In the **personal area** is concerned permanent process of professional preparation of young engineers, specialists and also scientists. This is possible in necessary quality only by interconnection of theoretical and pedagogical base of universities with application and experimental fields, which are represented by research institutes and particular companies.

**Economical goals** and effects of Centre formation are connected with the significance of aerospace engineering for economic contributions to whole industry.

### **Project contribution and impact on research and development areas**

Project contributions are related to goals and can be divided into several groups.

**Technical contributions** can be summarised by expressive improvement of technical and expertise levels of all scientific branches, which are included in the Centre, and their highlighting to the international level.

**Expressive improvement and better quality of educational process, interest enhancement of youth for technical branches and their insertion to the scientific-research activities and realisation groups give education contributions.**

Fundamental change in comparison with current distributed educational system, but also with scientific-technical activities will be introduction of effective connection for educational and scientific-research process as permanent element in the education system. Significant contribution will be also realisation of this process at particular objectives and projects in cooperation with industry and also at international level. Flight photo (see Figure 2) of KP-2 U aircraft, which was developed in close

cooperation with industry and aerodynamic and structural measurements are currently performed.

### **Project implementation manners and its schedule**

In the scope of the Centre close interconnection between technical universities, scientific-research institutions and manufacturers was established based on particular projects. This interconnection will practically result in formation of scientific-research teams employing knowledge and experience of the most eminent specialists in the field on one side and invention of young engineers on the other side. In Figures 3 is shown example of output from the project of new generation aircraft family, which is being prepared for realisation and will provide the basis on which the results of particular projects of the Centre will be verified.

### **Research program of the Centre**

The research program is structured to particular projects that cover group of as highly specialised so "universal" disciplines. Particular projects solve specialised problems of aviation and space disciplines with impact on several other disciplines.

### **Participation on the realisation of study programs**

Standard education programs of young engineers will be significantly enriched by the scientific work on the implementation of particular projects and in specialised teams with increased responsibilities of students solving the problems. Postgraduate students represent key capacity in all institutions forming the Centre. The age structure of ARC is shown in Figure 4.

### **Conclusion**

The aerospace research concentrates basically all science disciplines, which play important role in the technology development. If we consider other related disciplines such as meteorology, aviation medicine, psychology, navigation, flight control and others it becomes clear why the aviation has crucial importance for technological level of entire economy of the country. The concept and particular projects of ARC cover entire field of aviation and in its seeming independence present complex of disciplines that lead to practical application on aircraft up to the stage of certification.

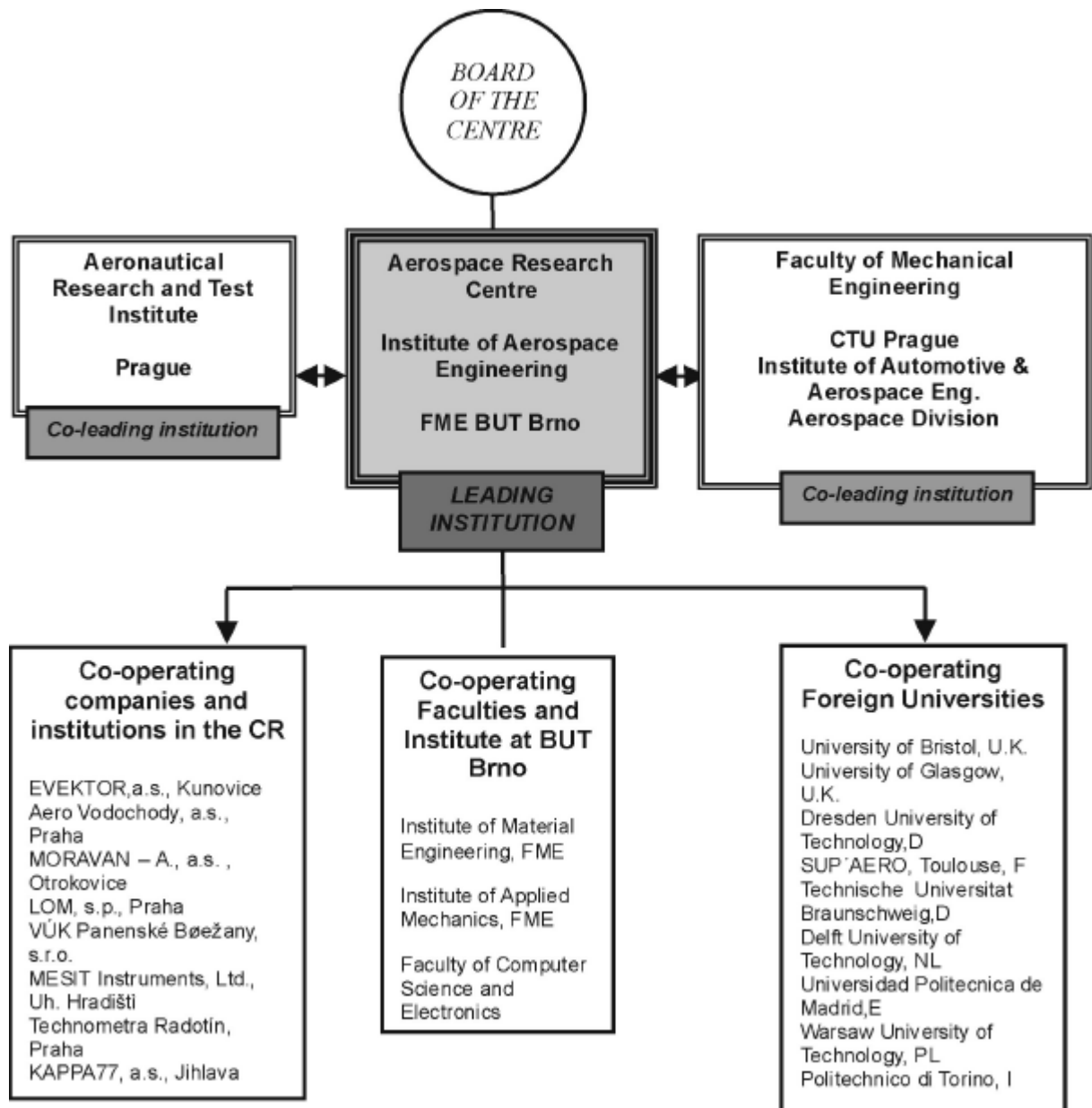


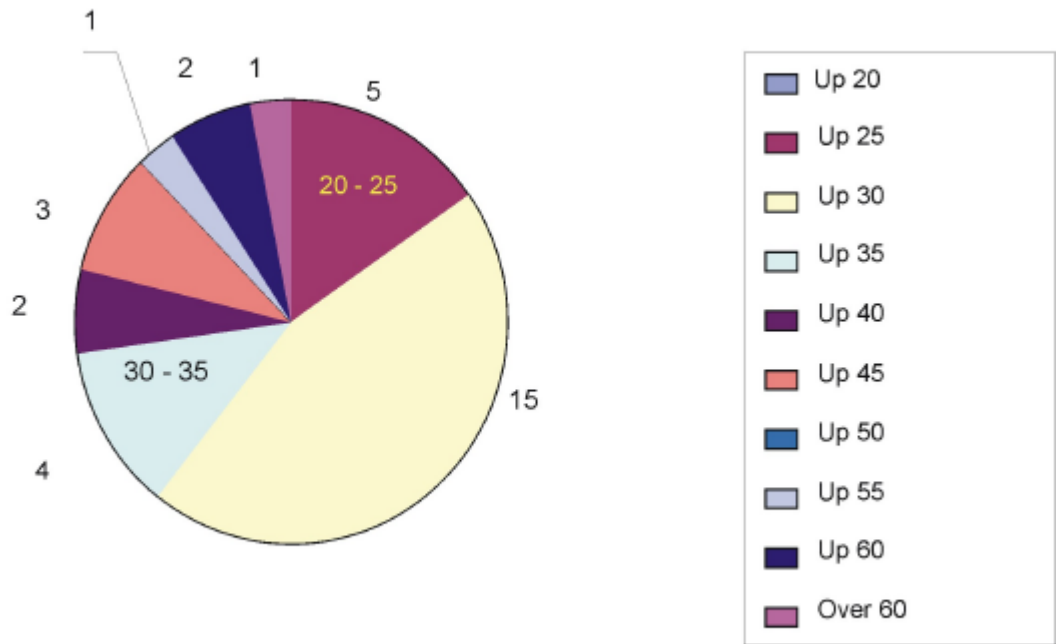
Figure 1 Structure of the organisation ARC



*Figure 2 The aircraft KP-2 U, which was developed in close co-operation of IAE with KAPPA77, a.s. Company and aerodynamic and structural measurements are currently performed in ARC framework*



*Figure 3 VUT100 – four / five – seat training and tourist aircraft of new generation. CAD – model of aircraft in software UNIGRAPHICS*



**Age average 34, 33 personnel**

*Figure 4 Employee age structure of ARC*