

WHY EUCASS

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Four hundred European Aerospace specialists meet today in Moscow under the aegis of the Russian Academy of Sciences, as a joint initiative of TsAGI and ONERA, in order to exchange ideas on their activity in aeronautics and space.

This activity has large dimensions. In 2004, the European Aerospace industry, whose output approximates 0,75 % of EU GDP, had an estimated turnover of 75 B€ and 407,000 employees. Space contributed at the level of 4.8 B€ and 35,500 employees. The trade surplus reached 3.5 B€. R and D investments are stable at around 14 % of turnover (60 % industry financed).

The expansion of aerospace started after the second world war and became a trademark of the cold war. Because of its strategic nature, aerospace has undergone a major change with the disappearance of the Soviet Union in 1991. Before that date, the Soviet Union and the United States of America were the leaders in aerospace, through their governments. Leadership meant on both sides ideas, programs and investments. That leadership vanished totally

in Russia after 1991, and was therefore and is today exercised only by the United States. In between Europe has slowly freed itself from the American tutelage and stands today on its own strength. Without any chauvinistic exaggeration, it can be said that France played a central role in this evolution: in aeronautics by the creation and development of Airbus; in space by being the first small nation after the BigTwo to orbit satellites in 1965 and by fathering the European Space Agencies, culminating with ESA and ARIANE. Very early we in France considered that since Europe did not stop at the German border, it was essential to build a bridge with the Soviet Aerospace complex. At the first COSPAR meeting in January 1960, I approached Akademik General Anatoly. A. Blagonzarov and he responded by offering in an interview with the most important French newspaper a cooperation in space between the Soviet Union and France. That idea took some time to materialize, but in April 1966 a French delegation I was a member of, was sent to Moscow by President C. de Gaulle, in order to negotiate the agreement which he signed in the following June. That was the start

of a long and profitable cooperation between Soviet and French scientists, in particular in the domain of planetary exploration illustrated by the successful launching of two balloons in the atmosphere of Venus in 1985, and also by the orbiting by the Soviet Union of the first European cosmonaut Jean-Loup Chrétien in 1982. Under the leadership of my friends Ronald Sagdeev, director of IKI, and Valery Barzukhov, director of the Institute of Geochemistry, the planetary program was opened in 1980 to European partners and was in 1991 on the verge of claiming the international leadership in the exploration of the solar system.

Since the 1990's the evolution of Aerospace in the world has accelerated. Today the aeronautics industry in Europe is very alive. For the civil sector, 2005 looks like another strong year with Airbus expecting to deliver 350 to 360 aircraft, compared with 320 deliveries in 2004. Its order book is healthy with 370 orders (+ 30 %) before le Bourget airshow in June where contracts for amounting to 33,5 B€ for 280 airplanes were concluded. Meanwhile, the return to growth of aircraft deliveries and of air traffic sends out positive signals. Total international passenger growth in 2004 reached 11 %, while the average annual growth is expected to reach 6 % in 2004-2008. At le Bourget 11 new planes were shown (compared to 12 in 2003) including such European ones as the Airbus 380, the Dassault Falcon 7X and the Alenia M346. The next Moscow airshow will provide to our friends the opportunity to expose other new planes like the Russian YAK 130 and the Ukrainian Antonov 148, not mentioning the very successful Sukhoi 30, the star of Russian exports. This leads us to a brief consideration of the war planes market. Out of 23,000 operational planes in the world, 7,000 will have to be replaced in the next 20 years, including 1,400 in Europe. In 2002, 200 war planes have been delivered, 250 in 2003, 370 in 2004, and this number at the beginning of the next decade should reach approximately 270 for a value varying from 35M\$ (27 M€) to 55 M\$ per aircraft. Two major new develop-

ments, the drones and the missiles will certainly transform the military paradigm in the next ten years.

The situation of the space part of the aerospace activity is much less favourable. After three years of steady decrease, the European space industry business experienced indeed a rebound in 2004 with a 19 % increase in turnover, but a decrease of 3.220 in employment. The turnover growth was supported equally by sales to institutional and commercial customers: the institutional customers supported the growth of sovereignty applications (guaranteed access to space, defence programmes, navigation/localisation and Earth observation; the commercial markets hit an all-time low in 2003. The European space budget corresponds to 1 B€ for launchers, 3 B€ for satellites, 0.7 B€ for ground support and 1.8 B€ for launcher development, production, and test activity. In 2004 and 2005, the situation remains uncertain with insufficient orders to look ahead to the future. The basic fact is that in the years 1995-2000, 30 yearly launches in GEO were expected, and the reality for the next ten years is approximately only 10 per year. Facing the crash of the commercial market characterized by high levels of competition, cyclical and abrupt evolutions, global demand and shorter lead times, the institutional market, supported by government funds or publicly owned satellite operators, has stayed constant at a relatively by low level. The consolidated turnover has gone for the commercial market, from 2.7 B€ in 2001 to 1.5 B€ in 2004. The corresponding figures for the institutional market are 2.4 B€ in 2001 to 2.9 B€ in 2004 to be compared with the American space budget in 2005 of 18 B\$ for military space and 16 B\$ for civilian space.

These figures are the consequences of the difficulties encountered by the Europeans to include space in their strategy. If the aeronautics industry is trying with courage to restructure itself, as is exemplified by the creation of EADS and recently of Safran by fusion of SNECMA and SAGEM but, also in Russia,

first by the creation of IRKUT and SUKHOI, and now by the negotiations towards setting up OAK, the situation in space depends only on political decisions made at the highest level.

Today nobody knows where to place space among the governmental priorities:

- In the United States, Europeans see a historic partner and global space leader whose motives are now viewed as suspicious. European government officials openly question whether NASA will honour its full treaty commitments with respect to the international space station.
- To move out of the man-in-space quagmire, President Georges W. BUSH has proposed a so called exploration program. For this long term space exploration, Europeans are willing to be led by the United States, but only if the U.S. government engages in a full partnership, a development that will increasingly be hamstrung by U.S. technology transfer regulations.
- Roskosmos would like to promote its proposed clipper new exploration vehicle, with the message that Europe should not rely on the United States and cut a deal with Russian. European government officials feel they have no problem playing the Russian card, but only if Russian can be persuaded that cooperation means more the sending European taxpayer money to Russian organizations.

They are signs that cooperation between Europe and Russia is increasing and could become a major parameter in the world's space organization. One of them is the inclusion of Soyuz in the ARIANESPACE roster with a launch pad in French Guyana with a first launch in 2008. Another is the Oural agreement signed between CNES, the French space agency and Roskosmos in March 2005 for the development of the technology of launchers up to the level of macrodemonstrators in particular a new Vulcain engine, the Volga LOX/methane engine, new cryotechnical

structures, eventually a future experimental vehicle (FLEX) and an atmospheric reentry system. Each of these joint efforts costed at 100 M€ on each side up to 2010, will be conducted without exchange of funds. Another example is the cooperation between the Italian Fiat-Avio and the Ukrainian Youjnoe for the development of a cryotechnic upper stage of Vega, paid entirely by the Italian side. DLR is also working with Roskosmos on engine technology. It is unfortunate that these programmes are not correlated on the European side, and this is a sign of the European incapacity to define a space policy: the European space agency has not been able to convince its Member States to adopt an integrated programme in the domain of launcher technology. This deficiency stems from an outmoded, obsolete priority given by political or industrial leaders to nationalistic cold-war style objectives.

If we note that all the major European Aerospace programmes (from Airbus to Ariane) have a transnational nature, the corpus of European Aerospace engineers and research scientists lack too often a sense of belonging to a unique and single community. The World's Aerospace community disposes of a magnificent forum, the yearly Aerospace Sciences meeting run in Reno, Nevada, by the American Institute of Aerospace and Aeronautics. This meeting gathers about two thousand specialists, including a large number of Europeans.

We believe Europe needs a forum comparable to the Reno symposium for its Aerospace specialists, to meet, discuss their scientific and technological problems, ponder their priorities and to stimulate the preparation of programmes, including its Russian component which is unfortunately left aside frequently. Such a forum would shed more light to the Russian results, but also would bring the Russian scientific community into contact with their colleagues across the borders.

One of the main handicaps of the European scientific and industrial community is the

relatively low level of R and D money compared to the United States: the US spend 40 % of the total R and D budget and 78 % of the military R and D of the world. It is essential for Europe not only to increase the level of spending, but also and more important, to properly capitalize on its assets, among which I will quote the corpus of engineers and scientists which is in general not involved in Learning Societies, as well as the treasure of results obtained in the last fifty years in Soviet Union and Russia, which is not really available since not satisfactorily published.

There is a lot of talk in Europe about the so-called programme of Lisbon, adopted in 2002 by the European Union. Its objective is to increase the level of R and D spending from 1,8 % of the gross national product of each Member State to 3 % as in the United States. Since the proposal was made, nothing of substance has been achieved in this direction. But an investment strategy is not so much decided top down by high power politicians, than by the pressure exercised bottom up on the system by the interested parties. The existence of a visible, active, creative, unified community is the first prerequisite to the elaboration of scientific and technical policies, and as a consequence, to their implementation. This is why we have organized the present meeting, as the starting point for the development of multiple lobbies which we hope you will generate by hearing specialized presentations, discussing with your peers, exchanging e-mail addresses and telephone numbers, inventing joint ven-

tures and promoting them towards your various authorities.

This is the main objective of this first meeting. We expect also institutional advances, as the decision to hold such gatherings on a regular basis, for instance every two years, and the adoption of our forum by one European institute or association, may be the creation of an autonomous European Aerospace Association, on the model of the American Aerospace Association.

On the behalf of the organizers, I wish you a tumultuous meeting, where you will make friends and also enemies, and fill your address book with new names. Do not stick to the oral presentations, but engage in discussions and meals with known and unknown colleagues: I repeat that the objective of this forum is the creation of an active community. This is exactly what the space scientists have achieved with COSPAR, which has grown from thirty people in 1960 to two thousand eight hundred and fifty in 2004, engaged in so many cooperative projects that their number is not listed, and busy at all levels of governments and agencies to promote joint scientific programmes. Such a route has also been followed with great success by the European scientists involved in environmental research, which have created a few years ago the European Geophysical Union, patterned after the American Geophysical Union. What the scientists have done, let the engineers of the Aerospace community achieve also.