

Aircraft and space industry From super airplanes and Sea Launch to Exploration program

Ukraine entered the third millennium as a leading space state. Aircraft and space industry is one of the priorities for national economy. At the same time, mass production in aircraft industry is among foremost tasks for industry, because each job in aircraft plants creates 12 new vacancies in the industry.

Exploration and use of the space is the most important condition for scientific, technical, technological, and industrial potential development, maintenance of state interests in security and defense spheres for a long term, improvement of life quality, and Ukraine's participation in solving of general humankind problems.

Vladimir Knysh
reviewer

Ruslan and Mriya by Antonov

As informed by Dmitriy Kiva, Chief Designer of Antonov aircraft scientific and technical complex, there are only few countries in the world involved in development and production of planes. They include the USA, Russia, Ukraine, China, Canada, Brazil (not producing aircraft engines), and European Union states. Ukrainian aircraft designers developed a whole series of unique plane models, which outpaced other models of their class by originality of decisions and ideas, as well as by aerodynamic properties and are demanded on the world aircraft market.

Production presented by two aircraft plants (Aviant in Kiev and in Kharkov) is another constituent part of national aircraft building. These plants are equipped with everything necessary for mass production of the most modern planes of the big Antonov family. In particular, these are unique and the largest in the world transportation planes An-124-100 Ruslan, An-225 Mriya, An-70, passenger An-140 and An-148, specialized agricultural An-2M and An-3, amphibian An-2V, aerial photography plane An-30, meteorological protection plane An-30M, polar An-74, patrol aircraft An-72P, long-range radiolocation reveal plane An-71, and a lot of others. Moreover, Antonov aircraft scientific and technical complex has developed several types of airframes, hang-glidern, and motor foot launched airplanes. All planes are reliable, economically efficient, easy in servicing, and can land at air strips. Due to these qualities more than 1,500 Antonov planes were exported to approximately 50 countries of the world. By now 22 ths. planes of Antonov family were produced. Our An-12, An-26, and An-74 are still successfully operated in the European Union states. Poland produces An-28 planes up to now. By the way, European Union has recently put a requirement to certify An planes. We fulfilled the requirement and at present they meet European safety requirements.

Medium wide-body transportation short take off and landing (STOL) plane An-70 has good outlooks at present. It is able to carry large-size freights weighting 35-47 tons for a distance of 3,000-5,100 km. The plane provides carriage of 20 tons for the distance not exceeding 3,000 km in STOL regime at air strips. The plane can provide airdrop of armored cars, trucks, helicopters, engineering machinery, and paratroopers. Its four engines supply cruising speed of 750 km/hour with saving 20-30% of fuel if compared with turbojet engines. An-70 can be equipped as a commercial plane or a plane of long-range guidance and reveal, as a flying command post, patrol aircraft, or search and rescue airplane.

Regional passenger plane of a new generation An-148 is another novelty. It is designed for passenger or freight and passenger carriages at regional routes. It belongs to the family of double jet planes. It has a cabin for 75 passengers and equals to the most comfortable modern passenger planes by comfort indices. Production of An-148 has been already launched. More than 17 airlines have by now notified about intentions to purchase it. Contracts for purchasing of

41 An-148 have been signed. By the way, recently Argentina, Uruguay, and Venezuela showed interest in Ukrainian passenger planes An-148 and An-140.

Guinness record breakers

It should also be mentioned that commercial plane An-124-100 made on the basis of An-124 Ruslan is the largest freight plane in the world. It carried 90-tons hydraulic turbines, large size Liebherr truck cranes, American Euclides quarry dump trucks, 109-tons locomotive, GE90 General electric air engines, Lynx antisubmarine helicopters, space apparatuses, and other unique freights. Transportation of Siemens electric generator weighting 135.2 tons is registered in Guinness World Records in the chapter of the largest monofreight that was ever transported by air. A tremendous work volume waits for Ukrainian giant Ruslan on the world market of large size and super heavy air carriages. Experts forecast that needs of the market will triple by 2007 and would reach USD 1.4 bn. The market would expand up to USD 2.3 bn by the year 2030. Airlines would need at least several dozens of new Ruslan planes to this end. Antonov aircraft scientific and technical complex upgraded the plane to reach maximal load-lifting capacity of 150 tons (instead of present 120 tons) and installed completely new modern equipment.

Uncontainable “iron horses” from Motor Sich

OJSC Motor Sich is also dynamically developed over its 90-years old history. It is a steadily working company tooled up with the most modern equipment and using state-of-art technologies during production of contemporary “iron horses” – engines, which will be installed at the flying objects of the third millennium. Mass production aircraft plants of the CIS and foreign states are main consumers of Zaporozhye-made air engines. Nowadays Motor Sich produces, tests, services, and repairs 55 types and modifications of air engines for 61 plane and helicopter types operated in 109 countries.

Third in the world by space rating

Ukraine is one of the leading space states. Four launches of Ukrainian rocket carriers were fulfilled over the first half year of 2006 – three launches of Zenith-3SL rockets in the frames of the Sea Launch program and launch of Cyclon-2 rocket for the Ministry of defense of Russian Federation. In addition, works to implement joint Ukrainian-Brazil project to create space rocket complex Cyclon-4 are being continued. Drafts of frame agreement between the Cabinet of Ministers of Ukraine and the government of the USA on cooperation in research and peaceful utilization of space, frame agreement between the Cabinet of Ministers of Ukraine and European Space Agency on cooperation in research and peaceful utilization of space, and agreement between National space agency of Ukraine and National center of space research of France as to cooperation in the sphere of space activities are adjusted at the moment. Plan of Ukrainian-Chinese cooperation in research and peaceful utilization of space for 2006-2010 and Program of cooperation between Ukraine and Russian Federation to research and use of space for 2007-2011 have been already signed.

Five contracts to launch satellites from Baikonur firing pad would be fulfilled in 2007-2008 in the frame of the Land Launch program envisaging launching of satellites up to 3.5 tons. Sea Launch program deals with satellites weighting 4-6 tons to eliminate competition between the two programs.

Ukraine is going to operate approximately three Earth remote sensing Sich-2 and Sich-3 microsattellites (weighting up to 350 kg) until 2012. These satellites would work for domestic customer with the outlook to create international satellite informational exchange group.

These results have led to the third place of Ukraine in the world rating. Production volumes have increased by 176.3% (if compared with the similar period of the last year), while sales volumes expanded by 172.2%. International space activities of Ukraine have stirred up.

Ukraine and Exploration

Ukrainian specialists from the National center of management and testing of space apparatuses of Ukraine, State Design Office Yuzhnoye, and Lvov center of the Institute of space exploration, management of space programs, and scientific research of the National space agency of Ukraine have already discussed general world priorities in exploration and research of space with NASA colleagues. It took place during international workshop on preparation of general architecture and strategy of Exploration global space program for humankind. What can Ukraine propose for Exploration program? Let's say, to organize pilotless mission to study Mars in microwave and visual range, in particular to study its polar areas, exploration of lunar craters, search for water and mineral resources at the Earth natural satellite, cartography of the Moon, etc. Ukrainian experts are ready to elaborate programs and even to create necessary space apparatuses to this end.

Space biology is yet another sphere where Ukraine has scientific potential for cooperation with NASA. Results of research conducted in institutes of the National Academy of Sciences of Ukraine would provide basic elements for creation of life support and survival system of bases on the Moon and utilization of their wastes. Also it is important for studying influence of the Moon radiation over human beings and other organisms. Creation of lunar roving vehicle and other necessary space machinery developed in the Institute of hylology problems, Physical and technical institute of low temperatures, Institute of electric welding, and others is another important direction.

To conclude, Ukraine as an aircraft and space state of the third millennium is ready for fruitful mutually beneficial partnership in development and carrying out of the most complicated programs of aircraft and space machinery mass production and supply, as well as for cooperation in other formats.