OPPORTUNITIES FOR COOPERATION WITH NATIONAL ACADEMY OF SCIENCE OF UKRAINE IN THE FIELD OF AVIATION

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History

- «General agreement about scientific and technical cooperation in the field of aviation between NASU and SE Antonov" (from 2006)

The main aim:

ensuring the competitiveness and development of new technologies in the field of aviation material science, strength of structures and their elements, gas and aero dynamics and ect.

Form of cooperation:

Bilateral agreements between the institutes of ASU and SE Antonov on the base of the equirements of large industrial end user

The main topics of cooperatio

- -Applied aerodynamic research;
- - solving the problems of noise on the ground and in the cabin of aircraft;
- - strength of aircraft construction on the stage of its development and during its life cycle;
- - advanced new composite materials for various parts of aircrafts;
- - development and improvement of on-board electronic equipment, systems, equipment ;
- - solving of the problem of electromagnetic compatibility and lightning protection;
- - development of the integrated computer systems for the stages of development, production and technical support of the whole aircraft life cycle ;
- - automation of the design, production, preparation and maintenance of aircraft life cycle;

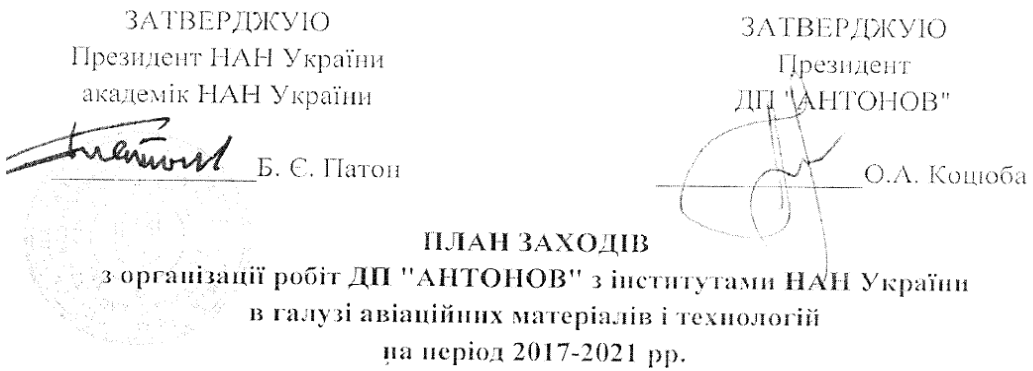
State of art

- Joint cooperation with Russian Federation in the field of aviation and space;
- Absence of full research and production cycles in Ukraine;
- The necessity of diversification and reorientation of production nomenclature;
- The problems with certification and etc.
- Official letters of the large Ukrainian industrial aviation companies (SE Antonov, Ivchenko Progress) to Prime Minister of Ukraine (from February 23, 2017) about the creation of the state center of aviation materials in Ukraine;
- Creation of Ukrainian Center of aviation materials;
- Establishing of new program of scientific and technical cooperation between the institutes of NASU and industrial aviation enterprises

New program of cooperation of NASU and SE Antonov

The main topics of cooperation:

1.New aviation materials, methods of their joining and processing;
2.The technologies of enhancing of the aircraft resource
3.Control of the technical state of materials and elements of aviation constructions



ЗАТВЕРДЖУЮ
Президент НАН України
академік НАН України
Б. Є. Патон

ЗАТВЕРДЖУЮ
Президент
ДП "АНТОНОВ"
О.А. Коцюба

ПЛАН ЗАХОДІВ
з організації робіт ДП "АНТОНОВ" з інститутами НАН України
в галузі авіаційних матеріалів і технологій
на період 2017-2021 рр.

New aviation materials, methods of their joining and processing

1.Development of high strength soldering alloy of the system Al-Mg-(Sc,Zr,Hf)-(Er,Tb) with nanodispersive strengthening and enhanced resource parameters for prolonged term of exploitation (IMP, PTIMA,IEW,PMI,IPMS);
2.Development of hybrid technology of production of construction details from titanium alloys by powder metallurgy methods (IPM);
3. Development and production of materials (soldering-knitting meshes from stainless wires) for fire protective screens and changing of asbestos reinforcing fabrics , produced in Russian Federation (IPMS)
4.Development of the technology of production of carbon-carbon materials for chassis airplane AN brake discs (IPMS)
5. Development and production of materials (copper soldered-knitted meshes) for lightning protection and for metallization of aggregates from polymer composite materials and their repairing (IPMS)

New aviation materials, methods their joining and processing

6. Study of the properties of materials and details produced by 3D additive manufacturing (IEW)
7. Development of the production technologies for castings from aluminum deformed and cast alloys B65 types (PTIMA);
8.Study of the methods of thermal and mechanical processing for production of the elements of armor from titanium alloy T110; (IPM)
9.Development of the technology of production of antifriction materials on the base of stainless steel and fluoroplastgraphite materials (IPMS);
10.Development of new high temperature binding materials to change the products from Russian Federation (ICSMC, IPC, ISHM)
11.Development of the technology of production of high strength crack resistant welded joints for the alloys Al-Cu-Mg and Al-Zn=Mg-Cu. (IEW, PMI)
12.Development of production technologies for light bulk construction elements from Al alloys by arc impulse welding (IEW)
13. Development of the diffusion welding technologies for details from aluminum alloys and various kinds of materials (IEW);

The technologies of enhancing of the aircraft resource

1. Development of the technologies of creation of wear resistant coatings on the inner surfaces of the hydro cylinders from BT122 alloys using cold plastic deformation and chemical and thermal processing (IPMS, PMI, ISHM);
2. Development of the technologies of surface modification in controlled nitrogen environment for the details of aviation technique from Ti-alloy T110 for enhancing wear and chilling resistance (PMI, ISHM)
3. Development of metal oxide coatings on the details from aluminum, titanium and manganese alloys for increasing of durability and corrosion resistance (PMI);
4. Increasing of reliability and durability of the elements of aviation constructions by using of high frequency plastic deformation of narrow zone of joining (IEW);
5. Development of creation of functional coatings for renovation of worn surfaces of friction details (IPS)

Control of the technical state of materials and elements of aviation constructions

1.Development of new technologies of monitoring of strength deformed state and degree of defectiveness of metal and composite elements of aviation constructions by acoustic emission, optical digital, vibration methods (PMI,IEW)
2.Development of the technologies of monitoring of degradation of aluminum alloys under long service period (PMI, IEW)

Joint cooperation concerning materials for aviation engines

Development of the alloys on the base of titanium aluminide for the working blades of compressors and turbines

Development of aluminum alloys which should be deformed with enhanced level of mechanical properties

Development of the niobium base alloys for special details of frames

Development of heat resistant titanium alloys for the blades of gas turbine engines

The main instruments of cooperation

- Ukrainian technology platform on Advanced Materials and Perspective Technologies of their Production
- Program initiative “Resource materials” which concerns materials with prolonged service terms (special part about materials for transport infrastructure and transport vehicles)
- NCPs (Transport, NMBP)

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NCP NMBP