



# General Assembly

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**Committee on the Peaceful  
Uses of Outer Space**

**International cooperation in the peaceful uses of outer  
space: activities of Member States**

**Note by the Secretariat**

**Addendum**

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## II. Replies received from Member States

### Ukraine

1. Ukraine's space activities in 2005 were oriented towards fulfilling the country's obligations in the framework of international programmes and projects, implementing the priority projects of the Third National Space Programme for 2003-2007, enhancing the efficiency of the work of the national space industry through restructuring and commercialization, introducing advanced methods of space technology on an increasingly large scale, creating the conditions for increasing competition and private initiative and establishing broad cooperation with international financial, scientific and technical and other organizations. Activities to implement priority projects are described below.

#### 1. Development of space technologies

##### *Global navigation satellite systems*

2. Work continued on the creation of a system for timing, positioning and navigational support for Ukraine, using the global navigation satellite system (GNSS). Consultations were held with the European Space Agency (ESA) and the European Commission on the following issues:

(a) Integration of that navigational system into the ground-based infrastructure of the European Geostationary Navigation Overlay Service (EGNOS);

(b) Participation of Ukraine in the European Position Determination System (EUPOS) project for Central and Eastern European countries with a view to setting up a network of functional additions to GNSS, which is to comprise the Global Positioning System (GPS) of the United States of America, the Global Navigation Satellite System (GLONASS) of the Russian Federation and the European Satellite Navigation System (Galileo) of the European Union and ESA.

3. Ukraine concluded an agreement with the European Union on cooperation on civilian GNSS (Galileo).

##### *Earth remote sensing*

4. In 2005, the Sich-1M and the experimental Mikron microsattellites were manufactured, tested and launched in order to obtain photographs of the Earth from space using optical and radio-frequency wavelengths. Because those satellites moved into an unplanned orbit, the applied scientific programme that was to use the data supplied by those satellites could be only partially implemented. The manufacture and testing of Sich-2 satellite units, designed to obtain medium resolution (about 8 m) images of the Earth, continued. The launch of that satellite is planned for 2007.

5. Systems for the reception of remote data have been further modernized. National facilities were used to receive a regular supply of data from the international Terra satellite, the satellites of the National Oceanic and Atmospheric Administration of the United States and the Meteor-3M remote sensing satellite of the Russian Federation.

6. Work was carried out on the use of aerospatial data in the management, scientific and economic fields, on integration into international systems and on initiatives for the use of data from the Global Monitoring for Environment and Security (GMES) and the Global Earth Observation System of Systems (GEOSS). In particular, projects were undertaken to establish norms regulating the collection, processing, interpretation and the confirmation of authenticity of the results obtained. Other projects established methodologies for processing aerospatial data, taking into account the rules set by the norm-creating projects, and the experimental processing of data was begun.

## 2. Space research

7. Ukraine's scientific space research has three basic areas of focus:

- (a) Exploration of Earth and near-Earth space;
- (b) Extra-atmospheric astronomy and astrophysics;
- (c) Space biology, the physics of weightlessness and technological research.

8. Exploration of Earth and near-Earth space continued, including the use of contact and remote methods to analyse the ionosphere, the magnetosphere, the atmosphere and the Earth's surface, to study sun-Earth links and to deepen knowledge of space weather.

9. On 24 December 2004, the Sich-1M remote sensing satellite was launched from the Plesetsk cosmodrome using the Tsiklon 3 launch vehicle. Because the Sich-1M satellite moved into an unplanned orbit, neither the programme of flight trials nor the applied scientific programmes were fully implemented; however, the Variant set of scientific instruments installed on the satellite for operation in orbit as part of an international project benefited from the resulting from the situation.

10. The Variant project is the first international space experiment to be carried out with broad international cooperation, involving France, the Russian Federation, Ukraine and the United Kingdom of Great Britain and Northern Ireland, under the leadership of Ukrainian scientists, in particular those of the Lvov Centre of the Institute for Space Research of the National Academy of Sciences of Ukraine (NASU) and the National Space Agency of Ukraine (NSAU).

11. Because the Variant project was intended to carry out experiments for the investigation of electromagnetic phenomena in the plasma of the Earth's ionosphere, the elliptical orbit that resulted in that case created unique conditions for monitoring from various altitudes.

12. Beginning in 2005, data from the Variant experiment were processed to measure the distribution of currents of the electromagnetic fields in the Earth's plasma. The ground-based support for the experiment was provided at the national level. A centre for the collection, processing and archiving of data was set up at the Institute for Space Research of NASU and NSAU in Kyiv. Required equipment was installed at the Ukrainian Akademik Vernadsky Antarctic station and at the test range of the National Academy of Sciences Radio Astronomy Institute at Kharkov.

13. A set of instruments to enhance antenna equipment was developed at the NSAU National Centre for Management and Testing of Space Resources at Yevpatoria, Crimea. Radio astronomy research was carried out, and preparations

were made for implementation of the Radioastron international project, for which a spacecraft launch is planned for 2007. The possibility of using an RT-70 antenna for the reception of radiotelemetric data from spacecraft in deep space was investigated.

14. Implementation of the programme on space biology, the physics of weightlessness and technological research continued. The aim of the programme is to investigate how microgravitation affects living creatures and to prepare experiments in the area of space material science and technology. Further work was done on the long-term programme of joint Ukrainian-Russian scientific research and technological experiments on board the Russian segment of the International Space Station. In 2005, a series of top-level experiments was prepared for execution in space, and the corresponding scientific equipment was developed.

15. Measures were taken to attract young people to work in the space sector. A regular competition was held for projects devised by youth associations, the results of which were reviewed at a scientific seminar. At that seminar, it was suggested that efforts be made to expand the pool of participants in the competition by attracting young scholars and students from non-technical fields of specialization and by involving student associations from other countries. The first youth satellite was developed: a spacecraft to conduct a hyperspectral survey of the Earth's surface. The satellite is being constructed as a technological variant of the MS-1 micro-satellite platform. On the basis of the results of the competition, work was carried out to create a model for a second youth satellite.

### **3. Space systems**

16. A main information room was set up at the National Centre for Management and Testing of Space Resources, and work is continuing on the creation and operation of an NSAU information analysis system.

17. The National System for Control and Analysis of the Space Situation carried out tests related to work on international programmes combating space debris and on the prevention of emergency situations relating to space objects. The system is ready for pilot use.

### **4. Cooperation with international organizations**

#### *Cooperation with the Inter-Agency Space Debris Coordination Committee*

18. The National Space Agency of Ukraine is continuing its work relating to the elimination of space debris and is devoting particular attention to the mitigation of space debris. The current use, modernization and design of space launch vehicles and spacecraft in Ukraine take into account recommendations made by the Inter-Agency Space Debris Coordination Committee (IADC), of which NSAU is a member. In the framework of IADC, NSAU exchanges information from research on space debris with the other space agencies and member organizations of IADC. In addition, NSAU is broadening cooperation on research on space debris and is developing new methods to resolve that problem. In 2005, a NSAU delegation took part in the work of the fourth European Conference on Space Debris and the twenty-third meeting of IADC in Darmstadt, Germany.

19. At the national level, NSAU provides constant support to research and arrangements concerning the problem of space debris that are being undertaken by organizations and businesses in Ukraine's space sector.
20. The priorities of that research are the following:
  - (a) Avoidance of the generation of space debris and reduction of the quantity produced by launching rocket vehicles;
  - (b) Prevention of the pollution of the space environment during spacecraft operation;
  - (c) Research on space debris using Ukraine's radio engineering capacity;
  - (d) Development and introduction of technical norms defining common requirements for mitigating space debris generated during the operation of spacecraft.

## **5. Launching of rocket vehicles**

21. In 2005, five launch vehicles produced in Ukraine were launched.
22. On 1 March 2005, the fifteenth successful launch of the Zenit-3SL launch vehicle with the XM-3 satellite of the United States on board was carried out from the Odyssey floating launch platform in the Pacific Ocean. That was the first launch in 2005 in the framework of the Sea Launch programme. At 6.52 a.m. Kyiv time, the XM-3 satellite was successfully delivered into its target orbit and separated from the DM-SL booster. The XM-3 satellite, weighing 4,702.1 kg, was produced by Boeing Satellite Systems of the United States and was designed to supply XM-range digital satellite broadcasting.
23. On 26 April 2005, the sixteenth successful launch of the Zenit-3SL launch vehicle was carried out with the Spaceway-1 satellite on board. Spaceway-1 is the first of a series of a new generation of satellites developed by the Hughes company to provide high-speed bilateral links to the Internet, transmission of digital data, voice communications, video and multimedia information. Its mass is 6,078.4 kg.
24. On 23 June 2005, the seventeenth successful launch of the Zenit-3SL launch vehicle was carried out with the Intelsat Americas 8 satellite on board. The satellite, with a mass of 5,500 kg, was created by Space Systems/Loral. It carries 22 C-range transponders, 36 Ku-range transponders and 24 Ka-range transponders, which provide coverage of South America, as well as North America, including continental United States, Alaska, Hawaii, Canada and Puerto Rico. Since the satellite's placement in geostationary orbit, it has been situated at 99° W. The launch was prepared and carried out by an international team of specialists, including representatives of Yuzhnoye State Design Office.
25. On 24 August 2005, in the framework of the Dnepr-Vostok project, a successful launch of the Dnepr-1 launch vehicle was carried out with two Japanese satellites on board: the Optical Inter-orbit Communications Engineering Test Satellite (OICETS) and the Innovative Technology Demonstration Experiment (INDEX). The Japan Aerospace Exploration Agency (JAXA) was the owner of the two satellites and the client for the launch. The principal payload, OICETS, weighing 570 kg, was constructed by NEC Toshiba Space Systems and contained experimental equipment for inter-satellite laser communication. The secondary

payload was the INDEX satellite, weighing 70 kg and constructed by the Institute of Space and Astronautical Science, a subdivision of JAXA. The satellite was designed for scientific research on the near-Earth environment of aurora polaris. Launch services were provided by the International Space Company Kosmotras, whose founders include the Ukrainian businesses Yuzhnoye State Design Office, Yuzhmash and Khartron.

26. On 8 November 2005, in the framework of the Sea Launch programme, the eighteenth successful launch of the Zenit-3SL launch vehicle was carried out with the Inmarsat-4 spacecraft, weighing 5,958 kg, on board. Inmarsat-4 is the fourth generation of satellites manufactured for the London-based global, mobile communications satellite operator Inmarsat. The Inmarsat-4 satellites support the Broadband Global Area Network (BGAN) communications system, which began operation in 2004. The BGAN system enables consumers to receive access to the Internet, corporate networks, video materials, video conference services, fax and telephone communications, electronic mail and local networks.

## **6. Bilateral cooperation**

27. Ukraine's cooperation with other States in the area of research and peaceful uses of outer space in 2005 was based on international treaties concerning the exploitation of outer space, on the international obligations of Ukraine with regard to space activities and on national legislation for the regulation of space activities.

28. By the end of 2005, Ukraine had treaty obligations with 24 States. Ukraine's policy on international cooperation was guided by the following basic principles:

- (a) Compliance with international obligations with respect to space activities;
- (b) Fulfilment of the priorities and objectives of Ukrainian foreign policy;
- (c) Strengthening of the position of national businesses in the world market for space technology and services;
- (d) Concentration of efforts on priority areas of space activity.

29. Efforts to strengthen international cooperation focused on creating favourable conditions under international law for the participation of national businesses in the space sector in international space projects, on promoting the participation of businesses in foreign trade and on ensuring that those companies maintained a stable, active presence on the space services market.

30. Ukraine's many years of collaboration with the Russian Federation are based on deep-rooted cooperation among firms, joint participation in international space projects, the use of Russian launch complexes for Ukrainian launch vehicles, the existence of long-term cooperation programmes and a coordinated plan of action among space agencies based on a long-term vision for the development of space technology.

31. The priority areas of collaboration with the Russian Federation in 2005 were work on implementing international commercial space projects, namely, Sea Launch, Dnepr, Earth-based launches and Tsiklon-4, and the preparation of research and experiments on board the Russian segment of the International Space Station.

32. Brazil has been an important partner of Ukraine in recent years. A well-developed relationship based on international law has led to implementation of a joint project for the construction of a Tsiklon-4 launch vehicle complex at the Alcântara Launch Centre. In 2004, implementation of the Tsiklon-4–Alcântara project entered its practical phase. Execution of that large-scale project is a priority for the further development of Ukraine’s space sector, because it involves the construction of a launch complex for the Ukrainian launch vehicle at a geographically favourable location. Negotiations have begun with Brazil on collaboration on other joint projects, including the establishment of a space system for Earth remote sensing and for carrying out scientific projects.

33. In the framework of collaboration with Brazil, a Ukrainian-Brazilian company, Alcântara Tsiklon Space, is being set up with the purpose of constructing the buildings and installations for the Tsiklon-4 launch complex at the Brazilian Alcântara launch site and serving as the operator of the Tsiklon-4 launches.

34. China remains a substantial partner of Ukraine in the space sphere. Collaboration with China is based on a long-term cooperation programme over the period 2001-2005. In 2005, a new draft long-term cooperation programme ending in 2010 was prepared. That future programme will contain long-term Ukrainian-Chinese projects for the joint launch vehicle engineering and for implementing scientific programmes, in particular a lunar programme.

35. Ukraine’s collaboration with the United States is evolving. In 2005, in the context of expansion and development of cooperation, a draft project was prepared for an outline agreement between the Cabinet of Ministers of Ukraine and the Government of the United States on cooperation in research and the peaceful uses of outer space. The signing of that agreement is planned for 2006.

36. In addition, Ukraine was officially invited by the head of the National Aeronautics and Space Administration of the United States to take part in the announcement by President George Bush in January 2004 of the new space initiative of the United States.

37. In 2005, there was a rise in the level of collaboration with the European Union in the space sphere. In the framework of the GMES project, in which Ukrainian research establishments are participating alongside their European counterparts, several research projects are being carried out. In particular, implementation of the composite project BEAR on forest biodiversity in Europe continues. The aim of the project is to form scientific research networks. It began in 2004 at the initiative of the International Astronautical Federation and ESA. In the context of that work, Ukrainian scientists are taking part in three research projects in the sphere of exploration of the Earth from space: the European-Russian-Ukrainian GMES Network for monitoring oil spills and oil and gas pipelines (ERUNET), for monitoring the condition of oil and gas pipelines and oil spills in the Black Sea and the Sea of Azov, western Siberia and the Carpathians; OSCSAR for monitoring oil spills in the Black Sea and the northern seas; and the Forest Ecosystem Monitoring in Northern Eurasia (FEMINE), for monitoring central Siberia, the northern part of the Russian Federation and Ukraine with the aim of assessing the dynamics of forest ecosystems, including how they are affected by logging, transportation, fires, pollution of the surrounding environment and other dangerous phenomena that destroy the ecological balance.

38. A scientific theme and the content of joint projects for a competition have been developed by the Centre national d'études spatiales (CNES) of France, the International Association for the Promotion of Cooperation with Scientists from the New Independent States of the former Soviet Union (INTAS) and NSAU. The joint INTAS/CNES/NSAU competition for research projects on space technologies is planned to be held in 2006. The competition will involve the development of basic and applied scientific research technologies but also include the development of commercial products. It will cover topics such as the atomic clock, fuel elements, new technologies for electric engines, new technologies for ecologically clean fuel for chemical engines, aerothermodynamics, nanoelectronics and the processing of photographs.

39. In the framework of the Ukrainian-European international technical support project, BISTRO-2, the project on drawing up recommendations to protect intellectual property in the context of the commercialization of Ukrainian space technologies was successfully completed. European experts prepared methodical recommendations on the protection of intellectual property in the context of commercialization of Ukrainian space technologies.

40. Given the availability in Ukraine of the requisite scientific and technical capacity and the national scientific research and technical production base, work is under way to determine the potential for including certain provisions of the future Ukrainian State Space Programme for 2007-2011 in the First European Union Space Programme.

41. Cooperation took place with Egypt, India, the Republic of Korea and Turkey. An Earth remote sensing satellite is being constructed in collaboration with Egypt. During the visit of the President of India to Ukraine, an agreement was signed between the Government of Ukraine and the Government of India on cooperation in research and on the peaceful uses of outer space, and a project for a long-term cooperation programme on joint activities in space engineering and space technology has been submitted for approval.