

The University of Mississippi School of Law

The National Center for Remote Sensing, Air, and Space Law

Informational resources on the legal aspects of human activities using aerospace technologies

Space Law: Selected Documents 2009

Volume 2: International Space Law Documents

Compiled by P.J. Blount
P.J. Blount, editor
Joanne Irene Gabrynowicz, editor



A supplement to the Journal of Space Law

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National Center for Remote Sensing, Air, and Space Law

Founded in 1999, the National Center for Remote Sensing, Air, and Space Law is a reliable source for creating, gathering, and disseminating objective and timely remote sensing, space, and aviation legal research and materials. The Center serves the public good and the aerospace industry by addressing and conducting education and outreach activities related to the legal aspects of aerospace technologies to human activities.

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Dedicated to

S. Neil Hosenball (1925-2009)

Dr. Hosenball served as NASA's General Counsel from 1975-1985. He participated in the drafting of the UN treaties on the peaceful uses of outer space and played a key role in negotiating the 1979 Agreement Governing the Activities of States on the Moon and Other Celestial Bodies.

"Law must precede man into space."

- Andrew G. Haley, Space Age Presents

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Space Law: Selected Documents 2009

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Selected Space Law Documents: 2009

Volume 1: National Space Law Documents

Volume 2: International Space Law Documents

Foreword

by

Joanne Irene Gabrynowicz

This compilation of space law documents for the year 2009 was gathered primarily from postings placed on the aerospace law blog, *Res Communis* from 1 January through 31 December 2009. *Res Communis* is hosted by the National Center for Remote Sensing, Air, and Space Law (Center) at the University of Mississippi School of Law. The postings are supplemented with materials from other sources that were published within 2009, but which were not published on *Res Communis*.

The blog's name, Res Communis, is taken from the Latin legal term that means, in part, "things common to all; that is, those things that are used and enjoyed by everyone." Res Communis is also a fundamental principle that provides a major part of the foundation of the international space law regime. The name was chosen because of its specific relevance to space law and to express the Center's intent that the blog provide the aerospace law community with a reliable, timely source of legal materials.

The annual compilation is a special supplement to the Journal of Space Law, the world's oldest law review dedicated to space law. The Journal of Space Law, beginning with the first volume, is available on line at the Center's website, http://www.spacelaw.olemiss.edu/index2.html, and through HeinOnLine, http://heinonline.org/.

This year's compilation is in two volumes: national space law documents and international documents. This demonstrates that the body of space law is growing in size and complexity. As these volumes go to press, important changes are occurring in the U.S. space program and a number of other national programs that will also impact a number of international cooperative projects. On the private side of space activities, both investments and activities are expanding. It can be expected that space law will continue to change for the practitioner, academic, and government lawyer. The reader can find updated material on an on-going basis at http://rescommunis.wordpress.com/.

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Conference on Disarmament 1st Part Geneva, 19 January – 27 March 2009

EU Statement on "PAROS" (12 February 2009)

Mr President,

I have the honour to speak on behalf of the European Union. The Candidate Countries Turkey, Croatia* and the former Yugoslav Republic of Macedonia*¹, the Countries of the Stabilisation and Association Process and potential candidates Bosnia and Herzegovina, Montenegro, Serbia, as well as Ukraine and the Republic of Moldova align themselves with this declaration.

- 1. I would like to assure you, Mr President, as well as all Coordinators, of my full personal support and the support of the European Union in your efforts to guide and lead our work.
- 2. The EU and its Member States recognize the ever-growing dependence of the international community on outer space for economic and industrial development and progress, as well as for ensuring security. Activities in this respect should be developed in a peaceful, safe and secure environment: an arms race in outer space must be prevented. Such prevention contributes to the strengthening of international security and promotes international cooperation in the field of free exploration and use of outer space for peaceful purposes by all states. Hence, the longstanding position of the EU and its Member States in the Conference on Disarmament (CD) which favours the enhancement of the multilateral framework concerning the preservation of a peaceful, safe and secure environment in outer space.
- 3. The EU places great importance on the relevant existing agreements and sees these as the basis on which we should build. We recall in particular the 1967 Treaty on the Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies (generally known as the Outer Space Treaty), the 1979 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space including the Moon and other Celestial Bodies (generally known as the Moon Treaty) and relevant existing arms control agreements.

^{*} Croatia and the former Yugoslav Republic of Macedonia continue to be part of the Stabilisation and Association Process.

- Very important from our point of view are also the Registration Convention 4. of 1975, the Liability Convention of 1972 and the Astronauts Rescue Agreement of 1968. The EU would also like to underline the relevance of the Hague International Code of Conduct against Ballistic Missile Proliferation and the need for its universalisation as highlighted in the concrete and realistic proposals presented by the EU at the UNGA and referred to in our statement at the CD of 20th January 2009. On the basis of these existing agreements space-faring nations are encouraged to provide advance notice if there is reason to believe that their activities may cause interference and thereby harm the operation of another nation's space objects. They are also encouraged to provide launch notifications registration. and These agreements transparency and are important confidence-building measures between space-faring and non-space-faring nations.
- 5. We also would like to recall that the EU last year introduced the United Nations General Assembly Resolution on the Hague Code of Conduct against Ballistic Missile Proliferation and that the EU Member States unanimously voted in favour of United Nations General Assembly Resolutions on "Transparency and Confidence-Building Measures in Outer Space Activities" and on "Prevention of an Arms Race in Outer Space" in the recent sessions of the UN General Assembly.
- The EU appreciates the efforts of the Russian Federation and the People's Republic of China to enhance international space security and to put the subject on the international agenda. In this connection we took note of the proposal for a draft treaty on the Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force Against Outer Space Objects (PPWT) last year in the CD.
- 7. Concerning the draft PPWT, in its statement of 28 February 2008 the EU already indicated that while it identifies itself with the overall goal to preserve outer space as an area free from armed conflict, further reflection and work is required on the elements for an effective international treaty. For example, it remains a difficult challenge to achieve consensus on the definitions needed for a legally binding instrument. As a matter of principle, an effective and robust verification system must be an integral part of any future Treaty concerned with space security. The EU considers it is not sufficient to only refer to a possible future additional protocol. Also any PPWT would need to clearly address the issue of anti-satellite weapons tests.
- 8. The EU therefore appreciates the discussion so far in the CD on PAROS. Furthermore, the EU welcomes the P6 decision to again task a coordinator to lead our discussions on this topic in the CD in 2009. We pledge to Ambassador Grinius our full support and place great confidence in his abilities. In that context, the EU emphasizes that further substantive discussion concerning space issues will take place when the proposed programme of work of the CD (CD/1840) is agreed. The EU again urges all CD members to show flexibility and to make consensus possible on the basis of this proposal.

- 9. The European Union also recognizes the relevant work carried out by the Committee for Peaceful Uses of Outer Space (COPUOS). We appreciate in particular the work of COPUOS on debris mitigation guidelines and the preservation of the space environment, which will include space rules of the road. The outputs of this work should be used as a basis for further transparency and confidence-building measures. The EU also supports the initiative for the long-term sustainability of outer space activities.
- 10. As the CD is aware, the European Union has been preparing a draft proposal for an international Code of Conduct for Outer Space Activities, aimed at increasing the security of outer space activities. On 8th December 2008, the Council of the European Union approved an initial draft text of the Code of Conduct for Outer Space Activities.
- 11. The draft text of the Code includes transparency and confidence-building measures; it is, however, not a legally binding document, nor does it seek to replace initiatives which work towards that aim. It recognizes that a comprehensive approach to safety and security in outer space should be guided by the following principles: freedom of access to space for all for peaceful purposes, preservation of the security and integrity of space objects in orbit, and due consideration to the legitimate defence interests of states. The main objective of the Code of Conduct is to strengthen the safety, security and predictability of all space activities, *inter alia* by limiting or minimising harmful interference in space activities. It covers all outer space activities: civil as well as military and present as well as future ones.

The main purpose of the project of the Code of Conduct is twofold:

- to strengthen the existing United Nations treaties, principles and other arrangements, as the subscribing parties would commit to comply with them, to make progress towards adherence to them, to implement them, and to promote their universality,
- to complement them by codifying new best practices in space operations including measures of notification and of consultation that would strengthen the confidence and transparency between space actors and contribute to developing good faith solutions that would permit the performance of space activities and access to space for all.

As the Code of Conduct would be voluntary and open to all states and would lay down the basic rules to be observed by space-faring nations, it does not include any provision concerning the specific question of non-placement of weapons in space. The purpose of such a Code is neither to duplicate or compete with the initiatives dealing with this specific issue, nor to oppose them. On the contrary, the project complements and contributes to those initiatives, *inter alia* by insisting on the importance to take "all measures in order to prevent space from becoming an area of conflict".

The draft text of the Code is distributed as attachment to this statement and is available on the website of the Council of the European Union (http://register.consilium.europa.eu/pdf/en/08/st17175.en08.pdf).

12. The European Union is currently consulting other space-faring nations on the text with the aim of reaching a consensus text that would be acceptable for as many states as possible. It is envisaged that at the end of the consultation process an ad hoc conference would be organized in order for states to subscribe to the Code. While it is not our intention to negotiate the Code in this forum, we will keep the CD informed on the progress of the work on the Code. More detailed information on the substance of the Code is available in the back of this room.

Thank you Mr Chairman.

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DRAFT CODE OF CONDUCT FOR OUTER SPACE ACTIVITIES As approved by the Council on 8-9 December 2008

Preamble

The Subscribing States,

Noting that all States should actively contribute to the promotion and strengthening of international cooperation relating to the activities in the exploration and use of outer space for peaceful purposes (hereinafter referred to as outer space activities);

Recognising the need for the widest possible adherence to relevant existing international instruments that promote the peaceful uses of outer space in order to meet emerging new challenges;

Convinced that the use of existing space technology, space telecommunications, and their applications, has important consequences in the economic, social and cultural development of nations;

Further recognising that space capabilities – including associated ground and space segments and supporting links – are vital to national security and to the maintenance of international peace and security;

Recalling the initiatives aiming at promoting a peaceful, safe and secure outer space environment, through international cooperation;

Recalling the importance of developing transparency and confidence-building measures for activities in outer space;

Taking into account that space debris could constitute a threat to outer space activities and potentially limit the effective deployment and exploitation of associated space capabilities;

Reaffirming their commitment to resolve any conflict concerning actions in space by peaceful means;

Recognising that a comprehensive approach to safety and security in outer space should be guided by the following principles: (i) freedom of access to space for all for peaceful purposes, (ii) preservation of the security and integrity of space objects in orbit, (iii) due consideration for the legitimate defence interests of States;

Conscious that a comprehensive code, including transparency and confidence-building measures could contribute to promoting common and precise understandings;

Adopt the following Code (hereinafter referred to as "the Code").

I. Core principles and objectives

1. Purpose and scope

- 1.1. The purpose of the present code is to enhance the safety, security and predictability of outer space activities for all.
- 1.2. The present Code is applicable to all outer space activities conducted by a Subscribing State or jointly with other State(s) or by non-governmental entities under the jurisdiction of a Subscribing State, including those activities within the framework of international intergovernmental organisations.
- 1.3. This Code, in codifying new best practices, contributes to transparency and confidence-building measures and is complementary to the existing framework regulating outer space activities.
- **1.4.** Adherence to this Code and to the measures contained in it is voluntary and open to all States.

2. General principles

The Subscribing States resolve to abide by the following principles:

- the freedom of access to, exploration and use of outer space and exploitation of space objects for peaceful purposes without interference, fully respecting the security, safety and integrity of space objects in orbit;
- the inherent right of individual or collective self-defence in accordance with the United Nations Charter;
- the responsibility of States to take all the appropriate measures and cooperate in good faith to prevent harmful interference in outer space activities;
- the responsibility of States, in the conduct of scientific, commercial and military activities, to promote the peaceful exploration and use of outer space and take all the adequate measures to prevent outer space from becoming an area of conflict;

3. Compliance with and promotion of treaties, conventions and other commitments relating to outer space activities

- 3.1. The Subscribing States reaffirm their commitment to:
 - the existing legal framework relating to outer space activities;
 - making progress towards adherence to, and implementation of:
 - (a) the existing framework regulating outer space activities, inter alia:
 - the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (1967);
 - o the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (1968);
 - o the Convention on International Liability for Damage Caused by Space Objects (1972);
 - o the Convention on Registration of Objects Launched into Outer Space (1975);
 - o the Constitution and Convention of the International Telecommunications Union and its Radio Regulations (2002);
 - o the Treaty banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and under Water (1963) and the Comprehensive Nuclear Test Ban Treaty (1996);
 - o the International Code of Conduct against Ballistic Missile Proliferation (2002).
 - (b) declarations and Principles, inter alia:
 - the Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space as stated in UNGA Resolution 1962 (XVIII);
 - o the Principles Relevant to the Use of Nuclear Power Sources in Outer Space as stated in UNGA Resolution 47/68;
 - o the Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries as stated in UNGA Resolution 51/122;

- o the Recommendations on the Practice of States and International Organisations in Registering Space Objects as stated in UNGA Resolution 62/101:
- o the Space Debris Mitigation Guidelines of the United Nations Committee for the Peaceful Uses of Outer Space as stated in UNGA Resolution 62/217.
- 3.2. The Subscribing States also reiterate their support to encourage coordinated efforts in order to promote universal adherence to the above mentioned instruments.

II. General Measures

4. Measures on space operations

- **4.1.** The Subscribing States will establish and implement national policies and procedures to minimise the possibility of accidents in space, collisions between space objects or any form of harmful interference with other States' right to the peaceful exploration and use of outer space.
- **4.2.** The Subscribing States will, in conducting outer space activities:
 - refrain from any intentional action which will or might bring about, directly or
 indirectly, the damage or destruction of outer space objects unless such action is
 conducted to reduce the creation of outer space debris and/or justified by
 imperative safety considerations;
 - take appropriate steps to minimise the risk of collision;
 - abide by and implement all International Telecommunications Union recommendations and regulations on allocation of radio spectra and orbital assignments.
- **4.3.** When executing manoeuvres of space objects in outer space, for example to supply space stations, repair space objects, mitigate debris, or reposition space objects, the Subscribing States agree to take all reasonable measures to minimise the risks of collision.
- **4.4.** The Subscribing States resolve to promote the development of guidelines for space operations within the appropriate for a for the purpose of protecting the safety of space operations and long term sustainability of outer space activities.

5. Measures on space debris control and mitigation

In order to limit the creation of space debris and reduce its impact in outer space, the Subscribing States will:

- refrain from intentional destruction of any on-orbit space object or other harmful activities which may generate long-lived space debris;
- adopt, in accordance with their national legislative processes, the appropriate policies and procedures in order to implement the Space Debris Mitigation Guidelines of the United Nations Committee for the Peaceful Uses of Outer Space as endorsed by UNGA Resolution 62/217.

III. Cooperation mechanisms

6. Notification of outer space activities

- 6.1. The Subscribing States commit to notify, in a timely manner, to the greatest extent feasible and practicable, all potentially affected Subscribing States on the outer space activities conducted which are relevant for the purposes of this Code, inter alia:
 - the scheduled manoeuvres which may result in dangerous proximity to space objects;
 - orbital changes and re-entries, as well as other relevant orbital parameters;
 - collisions or accidents which have taken place;
 - the malfunctioning of orbiting space objects with significant risk of re-entry into the atmosphere or of orbital collision.
- **6.2.** The Subscribing States reaffirm their commitment to the Principles Relevant to the Use of Nuclear Power Sources in Outer Space as stated in UNGA Resolution 47/68.

7. Registration of space objects

The Subscribing States undertake to register space objects in accordance with the Convention on Registration of Objects launched in Outer Space and to provide the United Nations Secretary-General with the relevant data as set forth in this Convention and in the Recommendations on the Practice of States and International Organisations in Registering Space Objects as stated in UNGA Resolution 62/101.

8. Information on outer space activities

- **8.1.** The Subscribing States resolve to share, on an annual basis, and, where available, information on:
 - national space policies and strategies, including basic objectives for security and defence related activities;
 - national space policies and procedures to prevent and minimise the possibility of accidents, collisions or other forms of harmful interference;
 - national space policies and procedures to minimise the creation of space debris;
 - efforts taken in order to promote universal adherence to legal and political regulatory instruments concerning outer space activities.
- **8.2.** The Subscribing States may also consider providing timely information on space environmental conditions and forecasts to other Subscribing States or private entities through their national space situational awareness capabilities.

9. Consultation mechanism

- 9.1. Without prejudice to existing consultation mechanisms provided for in Article IX of the Outer Space Treaty of 1967 and in Article 56 of the ITU Constitution, the Subscribing States have decided on the creation of the following consultation mechanism:
 - A Subscribing State with reason to believe that certain outer space activities
 conducted by one or more Subscribing State(s) are, or may be, contrary to the
 purposes of the Code may request consultations with a view to achieving
 acceptable solutions regarding measures to be adopted in order to prevent or
 minimise the inherent risks.
 - The Subscribing States involved in a consultation process will decide on a timeframe consistent with the timescale of the identified risk triggering the consultations.
 - Any other Subscribing State which may be affected by the risk and requests to take part in the consultations will be entitled to take part.
 - The Subscribing States participating in the consultations shall seek solutions based on an equitable balance of interests.
- 9.2. In addition, the Subscribing States may propose to create a mechanism to investigate proven incidents affecting space objects. The mechanism, to be agreed upon at a later stage, could be based on national information and/or national means of investigation provided on a voluntary basis by the Subscribing States and on a roster of internationally recognised experts to undertake an investigation.

IV. Organisational aspects

10. Biennial meeting of Subscribing States

- 10.1. The Subscribing States decide to hold meetings biennially or as otherwise agreed by Subscribing States, to define, review and further develop this Code and ensure its effective implementation. The agenda for such biennial meetings could include: (i) review of the implementation of the Code, (ii) evolution of the Code and (iii) additional measures which appear necessary.
- 10.2. The decisions will be taken by consensus of the Subscribing States present at the meeting.

11. Central point of contact

A central point of contact shall be nominated among Subscribing States to:

- receive and announce the subscription of additional States;
- maintain the electronic information-sharing system;
- serve as secretariat at the biennial meetings of Subscribing States;
- carry out other tasks as agreed by Subscribing States.

12. Outer Space Activities Database

The Subscribing States will create an electronic database to:

- collect and disseminate notifications and information submitted in accordance with the provisions of this Code;
- channel requests for consultations.

Annex (List of Subscribing States)



(Please check against delivery)

Statement by Mr. Md. Mustafizur Rahman, Charge d'Affaires of the Permanent Mission of Bangladesh to the UN Offices in Geneva, at the Conference on Disarmament in his capacity as the Coordinator of the Group of 21 on agenda item 3: Prevention of an Arms Race in Outer Space Thursday, 19 February 2009

Mr. President.

I have the honour to deliver the following statement on behalf of the Group 21.

Prevention of an Arms Race in Outer Space

- 1- The role of space technology in our day to day life has become pervasive. Never before have information, communication, banking, economic transactions, navigation, and even political and strategic decision-making been so dependent on space-based technologies, which are themselves witnessing rapid growth.
- 2- The Group reiterates that outer space and other celestial bodies are the common heritage of mankind and must be used, explored and utilized for the benefit and interest of all mankind in a spirit of cooperation. The Group reaffirms that the exploration and use of outer space and other celestial bodies shall be for peaceful purposes and shall be carried out for the benefit and in the interest of all countries, irrespective of their degree of economic or scientific development.
- 3- The Group stresses that the growing use of outer space increases the need for greater transparency, confidence building measures and better information on the part of the international community. The Group believes that all States, with major space capabilities, have special responsibility to contribute actively to the objective of the peaceful use of outer space and of the prevention of an arms race in outer space and to refrain from actions contrary to that objective and to the relevant existing treaties in the interest of maintaining international peace and security and promoting international cooperation.
- 4- The Group recognizes that prevention of an arms race in outer space would avert a grave danger for international peace and security. The Group emphasizes the necessity of further measures with appropriate and effective provision for verification to prevent an arms race in outer space in all its aspects.
- 5- The Group emphasizes the importance and urgency of preventing an arms race in outer space. In this regard, the Group is deeply concerned over the negative implications of the development and deployment of anti-ballistic-missile defense systems and the pursuit of advanced military technologies capable of being deployed in outer space which have, inter alia, contributed to the further erosion of an international climate conducive to the promotion of disarmament and strengthening of international security.

- 6- The Group of 21 stresses that all countries bear a responsibility to refrain from activities that could jeopardize the collective goal of maintaining outer space free from weapons of mass destruction and all other forms of weaponization so as to ensure that its benefits are available to all.
- 7- The Group considers that the multilateral disarmament agreements provide the mechanism for States parties to consult one another and to cooperate in solving any problems which may arise in relation to the objective of, or in the application of, the provision of the agreements, and that such consultations and cooperation may also be undertaken through appropriate international procedures within the framework of the United Nations and in accordance with the Charter.
- 8- The prevention of an arms race in outer space has assumed greater urgency because of legitimate concerns that existing legal instruments are inadequate to deter further militarization of outer space, or prevent its weaponization. The Group further reaffirms its recognition that the legal regime applicable to outer space does not in and of itself guarantee the prevention of an arms race in outer space. For that purpose, the Group stresses the need to consolidate and reinforce that regime and enhance its effectiveness.
- 9- In this regard, the Group reaffirms that the Conference on Disarmament is the sole multilateral disarmament negotiation forum of the international community, which has the primary role in substantive negotiations on priority questions of disarmament. The Group considers that it is time to start negotiation in the Conference on Disarmament on matters related to the "Prevention of an Arms Race in Outer Space".
- 10- In addition, the United Nations General Assembly resolution 63/40 on "Prevention of an arms race in outer space" further made the following observations with regard to the Conference on Disarmament.
 - The CD should complete the examination and updating of the mandate contained in its decision of 13 February 1992 and establish an Ad Hoc Committee during the 2009 Session.
 - The CD has the primary role in the negotiation of a multilateral agreement or agreements on the prevention of an arms race in outer space in all its aspects.
- 11- The Group takes note of the United Nations General Assembly resolution 63/68 on "Transparency and confidence-building measures in outer space activities." The Group, while stressing the priority of negotiation of legally binding instruments on strengthening the international legal regime on Outer Space, recognizes that global and inclusive transparency and confidence building measures, arrived at through broad international consultations, could be important complementary measures.
- 12- In this regard, the Group welcomes the joint Russian-Chinese initiative of a draft treaty on the "Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force Against Outer Space Objects" (PPWT) presented by the Minister of Foreign Affairs of Russian Federation in the Conference on Disarmament on 12 February 2008. This initiative is a constructive contribution to the work of the Conference, and is a good basis for further discussion toward adopting an international binding instrument.

I thank you

In the name of God the compassionate the merciful

Mr. President

Since it is the first time I take the floor under your presidency, allow me to congratulate you on the assumption of the post as the President of the Conference on Disarmament. I assure you of the full cooperation and support of my delegation. I also would like to extend my thanks and appreciation to your predecessor Ambassador Le Hoai Trung of Viet Nam which under his presidency the CD had a good start this year.

I fully associate my delegation to the statement delivered by Ambassador Idriss Jazairy on 12 February 2009, on behalf of the G21 on Nuclear Disarmament and the statements of the G21 on PAROS and NSA delivered today by Mr. Mustafizur Rahman the distinguished representative of Bangladesh.

Mr. President

Multilateralism is a key element in the foreign policy of the Islamic Republic of Iran. Consistent with this principled policy my delegation attaches great importance to the work of the Conference on Disarmament as the sole multilateral disarmament negotiating forum. In our view the CD should perform its responsibilities in a manner to meet the security concerns of all states.

In specifying the most serious threat to the security of all states, we can point to the existence of nuclear weapons. The existence of nuclear weapons simply means that all states will continue to live with a permanent sense of insecurity. Along that line the primary goal for the CD should be to remove this source of insecurity and to establish a world free of nuclear weapons. In such circumstances we see no other issue more urgent than nuclear disarmament to be negotiated in the CD.

The Non Aligned Movement as the largest grouping in the UN system consistently calls Nuclear Disarmament as its highest priority. The final declaration of the Ministerial Meeting of the Non-Aligned-Movement which was held in Tehran last July, once again re-emphasized on the highest priority that NAM gives to the Nuclear Disarmament. Despite the obligations under article VI and undertakings by the nuclear weapon States in 1995 and 2000, developments in the area of nuclear disarmament have not been promising. Failures towards achieving the goal of the complete nuclear disarmament still threaten international peace and security. We are approaching the 2010 NPT Review Conference. We want to see a positive

change in order to have a successful review Conference and to ensure the world that nuclear weapon states would be ready to seriously fulfil their commitments with regards to nuclear disarmament.

Mr. President

The Islamic Republic of Iran considers the total elimination of nuclear weapons as the only absolute guarantee against the use or threat of use of nuclear weapons. Pending the total elimination of these inhumane weapons, efforts for the conclusion of a universal, unconditional and legally binding instrument on security assurances to non-nuclear-weapon States should be pursued as a matter of priority. In our view the Conference on Disarmament is the appropriate body to fulfill this responsibility. Therefore, we call on the Conference on Disarmament to establish an Ad-hoc Committee to negotiate a legally binding instrument in that regard.

Mr. President

The Islamic Republic of Iran believes the outer space is a common heritage of mankind and must be used, explored and utilized for peaceful purposes and for the benefit and interest of all mankind in a spirit of cooperation and without discrimination. All the efforts should be done in order to secure the use of outer space for the well-being and prosperity of all nations around the world. Current legal regime proves to be insufficient to prevent an arms race in the Outer Space. CD is also the appropriate body to work in that regard. The draft treaty on PPWT presented to the CD by China and Russia last year is a step in the right direction that deserves further consideration.

Mr. President

In the view of the Islamic Republic of Iran an FMCT should contribute to the goals of nuclear disarmament and non proliferation in all its aspects. Iran advocates the FMCT which is comprehensive, discriminatory, internationally and effectively verifiable. Past production and existing stocks as well as the future production of fissile material for nuclear weapons or other nuclear explosive devices are to be covered under the scope of the Treaty.

We firmly believe the negotiation process on FMCT should be in the framework of Shannon mandate. Deviation from those agreements which were painstakenly achieved in the CD such as the Shannon mandate would neither be constructive nor serve any purposes.

Mr. President

These four core issues already recognized by the CD are equally important. Each of the core issues has its own merit. The CD should not prioritize one issue at the cost of others. As I explained, for Iran nuclear disarmament has the highest priority. In a realistic approach we are prepared to accommodate all these priorities. Therefore any proposal for the program of work needs to maintain the balance between the four core issues. The document CD/1840 failed to enjoy the consensus within the CD since it did not maintain the balance between these issues. Besides that the lack of clarity in some important aspects of the document prevented the CD members to support it. We need to learn from the lessons in the past. In providing any program of work the CD should pay careful attention not to follow the same path which takes us nowhere. Flexibility and compromise are expected from every member and based on a realistic approach. With a balanced and comprehensive program of work responsive to the four core issues, we hope the CD can start its substantive work.

Statement on PAROS
Garold N. Larson
Chargé d'Affaires, a.i.
United States of America
February 19, 2009

Mr. President,

As this is the first time I have formally taken the floor this year, let me congratulate you on assuming the role of President of the Conference. I also wish to commend the service of Ambassador Le Hoai Trung of Vietnam, who facilitated a smooth and rapid start to our work this year.

Mr. President,

We have all noted with concern the collision last week between the privately operated Iridium communications satellite, and the inactive Russian Cosmos satellite. We are in communication with the Russian Federation regarding the collision, and those discussions began promptly after the collision — this in itself is a valuable transparency and confidence building measure. The U.S. Department of Defense is currently assessing the events leading up to the collision, but will need additional time to arrive at definitive conclusions — perhaps weeks.

As a leading space-faring nation, the U.S. Government takes these issues very seriously. We have been, and continue to be, active in identifying potential hazards and are taking steps to preserve safety of flight in the complex environment of outer space.

Last week's collision underscores the increasingly congested space environment. Collisions, and other similar events, can have the effect of denying valuable areas of space for productive uses. This collision emphasizes the vital importance of international cooperation between governments and industry, which is critical in the future to improve space safety.

My delegation and I are looking forward to further productive discussions in this Conference in connection with outer space.

Thank you, Mr. President.

Dear Mr. President,

Dear Mr. Secretary-General,

Dear colleagues, ladies and gentlemen,

It was slightly over a year ago that I last spoke at this forum. Since that time, much efforts have been taken to improve the international situation. However, we did not manage to achieve any drastic positive change. Moreover, we have witnessed further increase of global conflict potential, which distracts us from the solution of urgent problems related to the need to enhance international stability and to establish an environment conducive to consistent steps in the field of disarmament and nonproliferation.

Today, we have to acknowledge our inability to overcome a stalemate in the field of multilateral disarmament. A stalemate situation in the Conference's activities that has continued for over ten years clearly reflects an unfavorable state of affairs in the field of international security. Efforts taken by groups of "like-minded" states are capable of partially solving disarmament problems; however, in a long-term perspective, such efforts will face serious restrains, which, in fact, could result in an erosion of the existing mechanisms, including this Conference. Of course, additional problems emerge due to the current global financial and economic crisis, which constrict the resource base for disarmament and conversion programs.

At the same time, it is quite obvious that under globalization the crisis cannot be overcome through military preparations or war as happened in 1930-s. Regretfully, the Cold War has "institutionalized" militarization in the field of international relations. We need to get rid of this holdover.

Russia is aware of its special responsibility as a nuclear state and permanent member of the UN Security Council for nuclear disarmament and strengthening of the WMD non-proliferation regime. My country has fully met its obligations under the START 1. Implementation of the Moscow Treaty (SORT) is well underway. It's now time to take new steps in this area aimed at making our world more secure.

We welcome the statements made by the new US Administration in favor of multilateral approaches to the maintenance of international security and disarmament. We are prepared, as was suggested by our American partners, to "reset" our relations. Conclusion of a new legally binding Russian-American treaty on strategic offensive arms could become a priority step in that direction.

Let me now read out the statement by Dmitry A. Medvedev, President of the Russian Federation, on this issue.

"On December 5 this year, the Treaty on the Reduction and Limitation of Strategic Offensive Arms (START 1) expires. The importance of this instrument for ensuring international peace and stability can hardly be overestimated. It played a historic role in ensuring strategic stability and security as well as reducing strategic offensive arms arsenals. Its implementation has made the world safer.

Today, we are facing a pressing need to move further along the road of nuclear disarmament. In accordance with its obligations under the Treaty on the Non-Proliferation of Nuclear Weapons Russia is fully committed to reaching the goal of a world free from these most deadly weapon.

As far back as in 2005 we invited the United States to conclude a new agreement to succeed START 1. It could be based on all the best elements of the Treaty which has been effectively operating, while reflecting present-day strategic realities.

In arriving at that decision, we have taken into consideration, among other things, the fact that the limits established by START 1 were met as far back as in 2001. At present, the numbers of strategic delivery vehicles and their warheads are considerably lower. Thus, START 1 is far from limiting Russia and the United States in the missile and nuclear sphere it, in fact, permits to increase the arsenals of strategic offensive arms.

Our approach to such an agreement is as follows. A future agreement should be legally binding. It is of no less importance that the instrument should be forward-looking and should limit not only warheads, but also strategic delivery vehicles, i.e. intercontinental ballistic missiles, submarine launched ballistic missiles and heavy bombers.

We also deem it necessary to exclude possible deployment of strategic offensive arms outside national territories.

I wish to emphasize that Russia is open to dialogue and is prepared for negotiations with the new US Administration. I fully share the commitment of the US President Barack H. Obama to the noble goal of saving the world from the nuclear threat and see here a fertile ground for a joint work.

I believe that constructive interaction in this field will contribute to general improvement of the Russian-US relations.

Dmitry A. Medvedev."

Ladies and gentlemen,

Today we witness a growing number of international initiatives on nuclear disarmament such as Hoover Initiative, Global Zero Initiative, Evans-Kawaguchi Commission, Luxemburg Forum, as well as the plan put forward by Mr. Gordon Brown, Prime Minister of Great Britain. Russia appreciates the focus of these initiatives on solving global security issues on a multilateral basis and is willing to positively contribute to their consideration.

However, progress towards "global zero" can only be achieved through strengthened strategic stability and strict adherence to the principle of equal security for all. In its turn this suggests the need to carry out a set of measures required for a sustainable and consistent disarmament process. Among those measures are:

- further advancement of nuclear disarmament by all nuclear-weapon States, with their "gradual" engagement in efforts already being undertaken by Russia and U.S.;
 - to prevent weaponization of outer space;
- to prevent operational deployment of strategic offensive weapons equipped with conventional warheads, i.e. the building of the so-called "compensatory" potential;
 - to ensure that States do not possess a "nuclear upload potential";
- to prevent attempts aimed at using NPT membership to implement military nuclear programs;
- -to ensure verifiable cessation of conventional capabilities' development coupled with efforts to resolve other international issues, including settlement of regional conflicts.

I would like to draw particular attention to the relationship between offensive and defensive weapons. Real progress in nuclear disarmament cannot be achieved in a situation when unilateral efforts to develop strategic ABM systems undermine this relationship. This is fraught with erosion of strategic stability and disbalancing of the system of checks and balances that ensures global parity.

Acting in the spirit of strategic openness, we propose a constructive alternative to unilateral plans in this crucial area, i.e. to unite efforts of all States interested in counteracting potential missile threats. Our package proposal with regard to developing cooperation remains on the negotiation table. We will develop and elaborate it. We are ready for a joint work based on equitable partnership.

Ensuring an effective and sustainable implementation of the Treaty on the Non-Proliferation of Nuclear Weapons, which is of pivotal importance for global security, and enhancement of its universality remains a priority. We deem it necessary to prepare for the forthcoming NPT Review Conference in 2010 agreed recommendations that would provide continued efficiency of the Treaty as a crucially

important instrument to prevent nuclear proliferation. We need to achieve unconditional fulfillment by its Parties of their obligations embodied in the indivisibility of three fundamental pillars – non-proliferation, peaceful uses of atomic energy and disarmament. The Third session of the Preparatory Committee of the Review Conference provides a great opportunity to reach an agreement on possible ways to intensify negotiations in all those areas.

Strengthening of the international nuclear non-proliferation and nuclear arms limitation regime is inextricably linked to the Comprehensive Nuclear Test-Ban-Treaty (CTBT). Russia ratified the Treaty in 2000. We have consistently advocated its early entry into force. The moratorium on nuclear tests, with all its importance, cannot serve as a substitute for legal obligations. Therefore we call upon all States whose accession is necessary for the Treaty's entry into force, to sign and ratify it as soon as possible. We have noted, naturally, some positive signals from Washington regarding possible changes in the US position on CTBT and expect that those signals are embodied in specific decisions of President Obama's Administration.

Nuclear-weapon-free zones contribute to strengthening nuclear non-proliferation regime, achieving peace and security regionally and globally. We welcome the completion of the ratification process by all Parties to the Treaty on a Nuclear-Weapon-Free Zone in Central Asia, which resulted in its entry into force.

The task to strengthen the nuclear non-proliferation regime in the Middle East remains urgent. We consistently advocate this region to become a nuclear-weapon-free zone and, eventually, a zone free from all other types of weapons of mass destruction. In 1995 and 2000, the NPT Parties already took decisions on the Middle East. Mutually acceptable solutions for their implementation need to be sought within the forthcoming preparatory activities for the NPT Review Conference. We stand ready for a joint work to fulfill that task as well.

IAEA verification activities need to be made more effective. The Additional Protocol to the Safeguards Agreement, ratified by Russia in 2007, is an efficient tool

of enhancing IAEA capacities in this field. We call on all countries to become parties to it. Eventually, the Additional Protocol is to become a universally accepted standard to verify the compliance of States with their NPT non-proliferation obligations and a new major standard in the field of nuclear exports.

Growing interest in peaceful nuclear energy is a trend of current economic development. Energy security and climate are necessarily linked to peaceful nuclear applications, which should be used more widely in full accordance with the NPT States parties' inalienable right to develop research, production and use of nuclear energy for peaceful purposes. This opens up new opportunities for international cooperation, primarily to ensure stable and secure supplies of nuclear fuel for countries developing their nuclear energy sector, subject to due compliance with the requirements of the nuclear non-proliferation regime. We note the increasing importance of multilateral approaches that could serve as an economically sound and feasible alternative to the development of all elements of the nuclear fuel cycle nationally.

In recent years we have witnessed quite a few interesting initiatives in this field as well. Russia suggested that joint work should be carried out to develop global nuclear energy infrastructure through the establishment of multilateral centers for the provision of nuclear fuel cycle services. The International Uranium Enrichment Center has been already established in partnership with Kazakhstan at the Angarsk enrichment plant. We welcome the decision of Armenia and Ukraine to join this Center, as well as the interest in joining it shown by some other countries. The Angarsk Center plans to create a buffer stock of low-enriched uranium under the IAEA supervision to ensure guaranteed supplies of fuel in case of a market failure.

Our ability to adequately and timely respond to the threat of nuclear terrorism is a prerequisite for ensuring security of every State and of the entire world community. The Russian-American Global Initiative to Combat Acts of Nuclear Terrorism put forward in 2006 is a major contribution to this cause. It is already

being implemented and is growing in scale. 75 States have joined it to date. We are convinced that it will enjoy even broader support in the future. This is a good example of a possible cooperation modality in the modern world to find responses to new challenges and threats.

We support revitalization of multilateral diplomacy, primarily within the UN and the Conference on Disarmament. We note a considerable contribution of the Conference to the strengthening of international security. We express our gratitude to all delegations and to Mr. Sergei Ordzhonikidze, Secretary-General of the Conference, for their efforts to enhance relevance of this forum, including their persistent efforts to build consensus with regard to its programme of work.

Preventing weaponization of outer space is of particular importance among disarmament issues. When Russia and China introduced a draft international Treaty on the Prevention of the Placement of Weapons in Outer Space (PPWT) at this Conference last February, they felt that it was easier to prevent weaponization of outer space than to get rid of new stockpiles of weapons afterwards. Prevention of an arms race in outer space will also contribute to making the strategic situation predictable and preserving integrity of orbital assets. This should serve the interests of all States using outer space for peaceful purposes.

Russia and China will soon introduce a document summing up the outcome of the Conference debate and outlining our response to the comments received regarding the draft PPWT. We hope that it will serve as useful input to future negotiations.

A year ago at this forum Russia also introduced draft basic elements of an international legal agreement on the elimination of intermediate-range and shorter-range (ground-launched) missiles. We reiterate our call for a detailed discussion of this initiative that has gained a great deal of support. Our idea is echoed by the EU-backed proposals of French President Nicolas Sarkozy to start negotiations on banning intermediate-range and shorter-range ground-to-ground missiles. We are prepared for a constructive dialogue with both the EU and all other partners on

possible ways of dealing with these issues with a view to establishing a universal regime for banning these types of missiles.

We are also prepared to start negotiation on a treaty banning the production of fissile material for nuclear weapons purposes (FMCT), which would become an important milestone in the processes of nuclear disarmament and strengthening the nuclear non-proliferation regime.

In conclusion, I would like to state the following. In our view, the efforts made to harmonize the priority items on the Conference agenda in order to resume its substantive work are inextricably linked with general search for ways to overcome the present-day crisis phenomena: be it in financial and economic, military and political, environmental or other areas. We can only solve the problems we are facing now through joint action, by restoring trust in global politics and making collective efforts meeting the interests of all States and the world community as a whole.

Russia is open to a constructive dialogue and stands ready to work jointly with its partners. The right moment has come today, for the first time after the end of the Cold War, for making real progress in resuming the global disarmament process on a broad agenda. I am convinced that we should not miss this opportunity.

Statement by Canada in the CD On Tabling of Canada's Working Paper concerning TCBMs for Space Security

Ambassador Marius Grinius 26 March 2009

Mr. President.

During the PAROS informal discussions held a few weeks ago, Canada spoke to a working paper on "The Merits of Certain Draft Transparency and Confidence-Building Measures and Treaty Proposals for Space Security". We would like to take the opportunity to formally table this working paper in the Conference on Disarmament.

The paper advances the case that strong transparency and confidence-building measures (TCBMs) can serve as important instruments in their own right, as well as elements toward an eventual treaty. The paper argues that the CD should consider security guarantees, such as a declaration of legal principles, a code of conduct, or a treaty, that would: (a) ban the placement of weapons in space, (b) prohibit the test or use of weapons on satellites so as to damage or destroy them, and (c) prohibit the test or use of satellites themselves as weapons. Agreement on robust security guarantees as a first step could help in laying the foundation and building the momentum for future legal protections.

We hope that this paper will contribute to the debate and discussions on how the CD can soon address the security challenges in outer space, in the context of a program of work.

I would again ask delegations to remain in their seats after the Plenary has adjourned today in order for the Secretariat to circulate the working paper in English and French, pending its formal distribution in due course by the Secretariat as an official CD document.

Thank you.

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CONFERENCE ON DISARMAMENT

CD/1864 29 May 2009

Original: ENGLISH

Decision for the establishment of a Programme of Work for the 2009 session

(Adopted at the 1139th plenary meeting on 29 May 2009)

The Conference on Disarmament,

In order to provide a programme of work for the Conference which does not prejudice any past, present or future position, proposal or priority of any delegation, nor any commitment undertaken in any other multilateral fora related to disarmament,

In pursuance of its agenda and taking into account the several proposals tabled since 1999 for the programme of work of the Conference on Disarmament,

Without prescribing or precluding any outcome(s) for discussions under paragraphs 1, 3 and 4 below, with a view to enabling future compromise(s) and including the possibility of future negotiations under any agenda item, thus upholding the nature of this forum,

Takes the following decision for the establishment of a Programme of Work for the current session:

1. To establish a Working Group under agenda item 1 entitled "Cessation of the nuclear arms race and nuclear disarmament" to exchange views and information on practical steps for progressive and systematic efforts to reduce nuclear weapons with the ultimate goal of their elimination, including on approaches toward potential future work of multilateral character.

Pursuant to its mandate, the Working Group shall take into consideration all relevant views and proposals past, present and future.

The Working Group shall present a report on the progress of its work before the end of the current session

2. To establish a Working Group under agenda item 1 entitled "Cessation of the nuclear arms race and nuclear disarmament" which shall negotiate a treaty banning the production of fissile material for nuclear weapons or other nuclear explosive devices, on the basis of the document CD/1299 of 24 March 1995 and the mandate contained therein.

GE.09-61443

Pursuant to its mandate, the Working Group shall take into consideration all relevant views and proposals past, present and future.

The Working Group shall present a report to the Conference on Disarmament on the progress of its work before the conclusion of the current session.

3. To establish a Working Group under agenda item 3 entitled "Prevention of an arms race in outer space" to discuss substantively, without limitation, all issues related to the prevention of an arms race in outer space.

Pursuant to its mandate, the Working Group shall take into consideration all relevant views and proposals past, present and future.

The Working Group shall present a report to the Conference on Disarmament on the progress of its work before the conclusion of the current session.

4. To establish a Working Group under agenda item 4 entitled "Effective international arrangements to assure non-nuclear-weapon States against the use or threat of use of nuclear weapons", to discuss substantively, without limitation, with a view to elaborating recommendations dealing with all aspects of this agenda item, not excluding those related to an internationally legally binding instrument.

Pursuant to its mandate, the Working Group shall take into consideration all relevant views and proposals past, present and future.

The Working Group shall present a report to the Conference on Disarmament on the progress of its work before the conclusion of the current session.

5. To appoint a Special Coordinator under agenda item 5 entitled "New types of weapons of mass destruction and new systems of such weapons; radiological weapons" to seek the views of its Members on the most appropriate way to deal with this issue.

The Special Coordinator shall take into consideration all relevant views and proposals past, present and future.

The Conference requests the Special Coordinator to present a report before the end of the current session

6. To appoint a Special Coordinator under agenda item 6 entitled "Comprehensive programme of Disarmament" to seek the views of its Members on the most appropriate way to deal with this issue.

The Special Coordinator shall take into consideration all relevant views and proposals past, present and future.

The Conference requests the Special Coordinator to present a report before the end of the current session.

7. To appoint a Special Coordinator under agenda item 7 entitled "Transparency in armaments" to seek the views of its members on the most appropriate way to deal with the questions related to this item.

The Special Coordinator shall take into consideration all relevant view and proposals past, present and future.

The Conference requests the Special Coordinator to present a report before the end of the current session.

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CONFERENCE ON DISARMAMENT

CD/1865 5 June 2009

ENGLISH

Original: ENGLISH and

FRENCH

CANADA

WORKING PAPER

On the Merits of Certain Draft Transparency and Confidence-Building Measures and Treaty Proposals for Space Security

- 1. Transparency and confidence-building measures (TCBMs) in the non-proliferation, arms control and disarmament field are instruments that are often used to make progress when the international community is unable to attain consensus that would be necessary for the negotiation of relevant treaties. Sometimes they serve as a precursor to what will hopefully follow. The best known example of that is the *Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space*, adopted on 13 December 1963 (resolution 1962 (XVIII)). Reading that document again, one is struck by how closely it predicted the text of the Outer Space Treaty of 1967. Looking back, one must conclude that the authors of these legal principles had in mind the end result of the Outer Space Treaty when they first set pen to paper. A relevant question for us today is should we do the same again for space security and start with a Code of Conduct to address the issues that were left unresolved in the Outer Space Treaty, or, should we launch directly into the negotiation of a new relevant treaty?
- 2. The Outer Space Treaty represents the best that could have been accomplished for space security during that era of the Cold War. It successfully banned the placement of weapons of mass destruction in outer space. It also banned the military use of the Moon and other celestial bodies, but permitted the military use of outer space for peaceful purposes. Space objects were granted freedom from harmful interference for peaceful purposes a phrase that came to be interpreted as "non-aggressive." To deal with the potential for the aggressive behaviour of space objects, the Outer Space Treaty referenced the United Nations Charter to ensure that a state's legitimate right to self-defence would also apply in relation to its activities in outer space. We must remember that the Outer Space Treaty was drafted at a time when nuclear weapons were the only way to successfully attack satellites, following the Limited Test Ban Treaty of 1963,²

GE.09-61592

¹ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, 601 U.N.T.S. 206 (1967).

² Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water, 480 U.N.T.S. 43 (1963).

which prohibited the carrying out of nuclear weapon test explosions or any other nuclear explosion in outer space.

- 3. In January 2007, we witnessed a return to anti-satellite weapon testing based on physical effects kill-mechanisms generated by the continuous advance of conventional weapons technology. The amount of space debris produced by this most recent test again demonstrated why in 1985 the then Soviet and American governments both unilaterally ceased the testing of such class of weapons. The international community's continued safe and sustainable use of outer space cannot endure the production of space debris through further anti-satellite testing, let alone recover from the wide scale, debilitating effects of fighting humanity's first war in outer space with such destructive and indiscriminate weapons. Indeed, even collisions among existing space objects could begin to limit our safe and sustainable use of outer space for peaceful purposes. Causing or leaving derelicts in outer space could also risk the further production of space debris when active or inactive satellites subsequently collide. The most recent Iridium and Cosmos satellite incident is a stark reminder of this possibility.
- 4. The continuous march of science and technology has also set several states on a course to develop ballistic missile defence interceptors to engage the re-entry vehicles and rocket bodies of ballistic missiles using conventional hit-to-kill mechanisms. In many ways, the international community's struggle to prevent nuclear weapons proliferation and their means of delivery, and the continued possession of nuclear weapons by a number of states, is now spilling over into the space security issue.
- 5. Canada's goals for space security can be found in the juxtaposition of the right of safe passage of space objects for peaceful purposes with the right of self-defence in the Outer Space Treaty and the UN Charter, informed by the technological prowess that now permits conventional weapons to successfully engage objects in outer space. Herein lies the unfinished work of the Outer Space Treaty. These new rules of behaviour must address space activities in peace as well as when the use of force consistent with the United Nations Charter occurs. We can argue that security guarantees should presage safe passage guarantees for space objects. Don't believe it? Ask yourself a simple question, "Should the world's first space-based weapon's be granted safe passage or freedom from harmful interference in outer space?"
- 6. Consider, for example, Article II's undertaking in Russia-China's draft Treaty on the Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force Against Outer Space Objects (PPWT),⁴ "not to resort to the threat or use of force against outer space objects." Notice how this undertaking follows one that would ban the placement of weapons in

³ For example, a space-based ballistic missile defence interceptor, a space-based anti-satellite weapon or an orbital bombardment system.

⁴ Letter dated 12 February 2008 from the Permanent Representative of the Russian Federation and the Permanent Representative of China to the Conference on Disarmament addressed to the Secretary General of the Conference transmitting the Russian and Chinese texts of the draft "Treaty on Prevention of the Placement of Weapons in Outer Space and of the Threat or Use of Force against Outer Space Objects (PPWT)" introduced by the Russian Federation and China, CD/1839, 29 February 2008.

outer space. Some have argued that the no force provision in this draft treaty would not have prohibited the anti-satellite weapon test of 2007 on China's own satellite.

7. The European Union (EU) has since proposed a draft Code of Conduct for Outer Space Activities⁵ outside of this forum but circulated to all CD members on 12 February, defining what it considers to be acceptable rules of behaviour to enhance the safety, security and predictability of outer space activities for all. It undertook these efforts within the context of the prior US Administration's reluctance to enter into any legally-binding instrument that would constrain America's freedom of action in outer space. Article 4.2 of the EU's draft Code of Conduct calls for Subscribing States to:

refrain from any intentional action which will or might bring about, directly or indirectly, the damage or destruction of outer space objects unless such action is conducted to minimise outer space debris and/or justified by imperative safety considerations;

This draft Code of Conduct was made public many months after the United States successfully modified a ballistic missile defence interceptor to engage a decaying satellite at a low altitude for the minimization of the production of space debris, an engagement that was undertaken for the protection of public safety.

- 8. Two issues arise from the EU's proposed safety guarantee. The first is that a national security prerogative is not an expressly authorised reason for the production of space debris. Some states might not accept this restriction on their national security when confronted with the possibility of a competitor's deployment of a constellation of a significant number of space-based weapons. The second issue with the proposal, is that it allows for a proliferation path for anti-satellite weapons that ought to be closed when judged against other possible or viable proposals for a more robust security guarantee.
- 9. Given that the means to ensure the safe burn-up of satellites during re-entry of the Earth's atmosphere can also be designed into the satellite beforehand, it can be argued that a better security guarantee than both the EU's draft Code of Conduct and the Chinese-Russian draft PPWT, would be for the international community to agree or accede to a ban or a pledge such as:
- 10. State [Parties]/[Signatories] to the [Treaty]/[Code of Conduct] [shall]/[should] not test or use a weapon against any satellite so as to damage or destroy it.
- 11. Note that such an undertaking would again need to be done in conjunction with a prohibition on the placement of weapons in outer space, lest we inadvertently provide a sanctuary for space-based weapons. Furthermore, a prohibition on the test or use of any satellite itself as a weapon capable of inflicting damage or destruction on any other object, would address the residual threat of a benign dual-use satellite serving as a weapon. Taken together, these three rules would prohibit armed conflict in outer space based on the application of physical force.

⁵ Draft Code of Conduct for Outer Space Activities, as approved by the Council on 8-9 December 2008, Council of the European Union, Brussels, 17 December 2008, No. 17175/08, PESC 1697, CODUN 61.

- 12. Interestingly, these rules can be crafted without the need to define a weapon, a satellite or even outer space, since the effects of the weapon are included within the proposed prohibitions, a satellite is a object that orbits round the Earth or other celestial body, and the prohibition on the placement of any weapon in outer space can be modelled on the language of Article IV of the Outer Space Treaty. To aid in the verification of a treaty or the compliance monitoring of a code of conduct, the definition of test could also be modelled on the following: where "test" means "to flight or field test in a manner observable to the national or multinational technical means of [verification]/[compliance monitoring] available to a State [Party]/[Signatory]."
- 13. The above security proposal would also obtain a concomitant safety guarantee preventing the production of space debris or derelicts that could result in the production of space debris during subsequent collisions. This proposed security guarantee therefore helps ensure the sustainability of outer space for the future. The risk to the international community of settling for a weaker proposal is that we will endorse a proliferation path for the test of specially designed or modified devices, to serve as anti-satellite weapons capable of producing indiscriminate effects through the production of space debris, or we will close an avenue for needed self-defence measures against the future prospect of space-based weapons.
- 14. This intervention should demonstrate how great care must be exercised when we depart from the familiar foundations of the Outer Space Treaty. It also speaks to the need for any new rules concerning a state's activities in outer space to be negotiated in an appropriate forum. Obtaining practical safety and sustainability measures for space activities should not inhibit the collective desire to achieve robust security guarantees for those activities in outer space currently accepted by the international community. And yet, most states recognize that going into the future, new rules of behaviour for outer space activities must be crafted in order to obtain its secure, safe and sustainable use in full consideration of the advances that have been made in conventional weapons technology. In this regard, Canada argues for security guarantees to be considered by the Conference on Disarmament (CD) and practical safety and sustainability measures for space activities to be considered in the Committee on the Peaceful Uses of Outer Space (COPUOS). To ensure that these forums do not work at odds with one another, increased co-ordination of the CD and COPUOS ought to be given favourable consideration by the Member States of both international bodies.
- 15. Most recently, the new US Administration has announced its intention to resume its leadership on space issues with a "worldwide ban on weapons that interfere with military and commercial satellites." We believe that this advance signal should bode well for our current discussions of space security within the Conference on Disarmament. We also welcome the new US Administration's pronouncements on addressing nuclear non-proliferation and nuclear disarmament issues and hope that these too will help us make progress on the space security file. A new found policy approach by a significant space actor should also inform our attempts to collectively define additional acceptable behaviours for the conduct of activities in outer space within the Conference on Disarmament.

⁶Available on <u>www.whitehouse.gov</u> under the heading of "Ensure Freedom of Space" as at 18 February 2009.

16. As we move forward on this important matter, let us recall the earlier collective experience with the *Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space* and keep in our minds from the outset, the new legal protections we would all prefer to govern our activities in outer space. Drafting hard security guarantees first, as a soft declaration of legal principles, might just provide the international community with a third answer to the two questions posited at the beginning of this paper.

Space Law: Selected Documents 2009, vol. 2

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XXVIIth General Assembly

Rio de Janeiro, Brazil

2009

IAU 2009 RESOLUTION B1

on

IAU Strategic Plan: Astronomy for the Developing World

The XXVII General Assembly of the International Astronomical Union,

recognizing

- 1. the goal of the IAU to encourage the development of astronomy and facilitate better understanding of the universe,
- 2. that the current activities of the International Year of Astronomy 2009 have made great strides in advancing knowledge of astronomy among citizens of all nations and awareness of its value to society,
- 3. that science education and research is an essential component of modern technological and economic development,

therefore resolves that the IAU should

- 1. place increasing emphasis on programs that advance astronomy education in developing countries,
- 2. approve the goals specified in the Strategic Plan "Astronomy for the Developing World" as objectives for the IAU in the coming decade.
- 3. assess programs undertaken during the IYA to determine which activities are most effective in advancing astronomy.

IAU 2009 RESOLUTION A1

on

Implementing the IAU Strategic Plan.

The XXVII General Assembly of the International Astronomical Union,

recognizing

- 1. the goal of the IAU to encourage the development of astronomy and facilitate better understanding of the universe,
- 2. that the current activities of the International Year of Astronomy 2009 have made great strides in advancing knowledge of astronomy among citizens of all nations and awareness of its value to society,
- 3. that science education and research is an essential component of modern technological and economic development,
- 4. Resolution B1 adopting the IAU Strategic Plan Astronomy for the Developing World passed by the XXVII General Assembly,

therefore resolves that the IAU should

- 1. give high priority to supporting the development of astronomy infrastructure in emerging nations,
- 2. proceed with the implementation of the IAU Strategic Plan Astronomy for the Developing World through the creation of a Global Development Office and seek appropriate additional resources for implementing the plan.

IAU 2009 Resolution B2 on

IAU 2009 astronomical constants

1. The XXVII General Assembly of International Astronomical Union,

Considering

- 1. the need for a self-consistent set of accurate numerical standards for use in astronomy,
- 2. that improved values of astronomical constants have been derived from recent observations and published in refereed journals, and
- 3. that conventional values have been adopted by IAU GA 2000 and IAU GA 2006 resolutions for a number of astronomical quantities,

Recognizing

- 1. the continuing need for a set of Current Best Estimates (CBEs) of astronomical numerical constants, and
- 2. the need for an operational service to the astronomical community to maintain the CBEs

Recommends

- 1. that the list of previously published constants compiled in the report of the Working Group on Numerical Standards of Fundamental Astronomy (see http://maia.usno.navy.mil/NSFA/CBE.html) be adopted as the IAU (2009) System of Astronomical Constants.
- 2. that Current Best Estimates of Astronomical Constants be permanently maintained as an electronic document,
- 3. that, in order to ensure the integrity of the CBEs, IAU Division I develop a formal procedure to adopt new values and archive older versions of the CBEs, and
- 4. that the IAU establish within IAU Division I a permanent body to maintain the CBEs for fundamental astronomy.

IAU 2009 RESOLUTION B3

on

the Second Realization of the International Celestial Reference Frame

The International Astronomical Union XXVII General Assembly,

noting

- 1. that Resolution B2 of the XXIII General Assembly (1997) resolved "That, as from 1 January 1998, the IAU celestial reference system shall be the International Celestial Reference System (ICRS)",
- 2. that Resolution B2 of the XXIII General Assembly (1997) resolved that the "fundamental reference frame shall be the International Celestial Reference Frame (ICRF) constructed by the IAU Working Group on Reference Frames",
- 3. that Resolution B2 of the XXIII General Assembly (1997) resolved "That IERS should take appropriate measures, in conjunction with the IAU Working Group on reference frames, to maintain the ICRF and its ties to the reference frames at other wavelengths",
- 4. that Resolution B7 of the XXIII General Assembly (1997) recommended "that high-precision astronomical observing programs be organized in such a way that astronomical reference systems can be maintained at the highest possible accuracy for both northern and southern hemispheres",
- 5. that Resolution B1.1 of the XXIV General Assembly (2000) recognized "the importance of continuing operational observations made with Very Long Baseline Interferometry (VLBI) to maintain the ICRF",

recognizing

- 1. that since the establishment of the ICRF, continued VLBI observations of ICRF sources have more than tripled the number of source observations,
- 2. that since the establishment of the ICRF, continued VLBI observations of extragalactic sources have significantly increased the number of sources whose positions are known with a high degree of accuracy,
- 3. that since the establishment of the ICRF, improved instrumentation, observation strategies, and application of state-of-the-art astrophysical and geophysical models have significantly improved both the data quality and analysis of the entire relevant astrometric and geodetic VLBI data set.,
- 4. that a working group on the ICRF formed by the International Earth Rotation and Reference Systems Service (IERS) and the International VLBI Service for Geodesy and Astrometry (IVS), in conjunction with the IAU Division I Working Group on the Second Realization of the International Celestial Reference Frame has finalized a prospective second realization of the ICRF in a coordinate frame aligned to that of the ICRF to within the tolerance of the errors in the latter (see note 1),
- 5. that the prospective second realization of the ICRF as presented by the IAU Working Group on the Second Realization of the International Celestial Reference Frame represents a significant improvement in terms of source selection, coordinate accuracy, and total number of sources, and thus represents a significant improvement in the fundamental reference frame realization of the ICRS beyond the ICRF adopted by the XXIII General Assembly (1997),

resolves

- 1. that from 01 January 2010 the fundamental astrometric realization of the International Celestial Reference System (ICRS) shall be the Second Realization of the International Celestial Reference Frame (ICRF2) as constructed by the IERS/IVS working group on the ICRF in conjunction with the IAU Division I Working Group on the Second Realization of the International Celestial Reference Frame (see note 1),
- 2. that the organizations responsible for astrometric and geodetic VLBI observing programs (e.g. IERS, IVS) take appropriate measures to continue existing and develop improved VLBI observing and analysis programs to both maintain and improve ICRF2,
- 3. that the IERS, together with other relevant organizations continue efforts to improve and densify high accuracy reference frames defined at other wavelengths and continue to improve ties between these reference frames and ICRF2.

Note 1: The Second Realization of the International Celestial Reference Frame by Very Long Baseline Interferometry, Presented on behalf of the IERS / IVS Working Group, Alan Fey and David Gordon (eds.). (IERS Technical Note; 35) Frankfurt am Main: Verlag des Bundesamts für Kartographie und Geodäsie, 2009. See www.iers.org/MainDisp.csl?pid=46-25772 or https://www.iers.org/MainDisp.csl?pid=46-25772 or https://www.iers.org/MainDisp.csl?pid=46-25772 or www.iers.org/mainDisp.csl?pid=46-25772 or https://www.iers.org/mainDisp.csl?pid=46-25772 or https://www.iers.org/mainDisp

IAU 2009 RESOLUTION B4 On Supporting Women in Astronomy

The International Astronomical Union XXVII General Assembly,

recalling

- 1. the UN Millennium Development Goal 3: promote gender equality and empower women,
- 2. the IAU/UNESCO International Year of Astronomy 2009 goal 7: improve the gender-balanced representation of scientists at all levels and promote greater involvement by underrepresented minorities in scientific and engineering careers,

recognizing

- 1. that individual excellence in science and astronomy is independent of gender,
- 2. that gender equality is a fundamental principle of human rights.

considering

- 1. the role of the IAU Working Group for Women in Astronomy,
- 2. the role of the IYA2009 Cornerstone Project She is an Astronomer,

Resolves

- 1. that IAU members should encourage and support the female astronomers in their communities,
- 2. that IAU members and National Representatives should encourage national organisations to break down barriers and ensure that men and women are given equal opportunities to pursue a successful career in astronomy at all levels and career steps.

IAU 2009 RESOLUTION B5

in Defence of the night sky and the right to starlight

The International Astronomical Union XXVII General Assembly,

Recalling

- 1. the IAU/UNESCO International Year of Astronomy 2009 goal 8: facilitate the preservation and protection of the world's cultural and natural heritage of dark skies in places such as urban oases, national parks and astronomical sites,
- 2. the Declaration approved during the International Conference in Defence of the Quality of the Night Sky and the Right to Observe Stars (La Palma, Canary Islands, 2007),

Recognising that

- 1. the night sky has been and continues to be an inspiration of humankind, and that its contemplation represents an essential element in the development of scientific thought in all civilisations,
- 2. the dissemination of astronomy and associated scientific and cultural values should be considered as basic content to be included in educational activities,
- 3. the view of the night sky over most of the populated areas of the Earth is already compromised by light pollution, and is under further threat in this respect,
- 4. the intelligent use of unobtrusive artificial lighting that minimises sky glow involves a more efficient use of energy, thus meeting the wider commitments made on climate change, and for the protection of the environment,
- 5. tourism, among other players, can become a major instrument for a new alliance in defence of the quality of the nocturnal skyscape.

considering

- 1. the role of the IAU Division XII Commission 50 and its WG Controlling Light Pollution,
- 2. the role of the IYA2009 Cornerstone Project Dark Skies Awareness,

resolves that

- 1. An unpolluted night sky that allows the enjoyment and contemplation of the firmament should be considered a fundamental socio-cultural and environmental right, and that the progressive degradation of the night sky should be regarded as a fundamental loss.
- 2. Control of obtrusive and sky glow-enhancing lighting should be a basic element of nature conservation policies since it has adverse impacts on humans and wildlife, habitats, ecosystems, and landscapes.
- 3. Responsible tourism, in its many forms, should be encouraged to take on board the night sky as a resource to protect and value in all destinations.
- 4. IAU members be encouraged to take all necessary measures to involve the parties related to skyscape protection in raising public awareness be it at local, regional, national, or international level about the contents and objectives of the International Conference in Defence of the Quality of the Night Sky and the Right to Observe Stars [http://www.starlight2007.net/], in particular the educational, scientific, cultural, health and recreational importance of preserving access to an unpolluted night sky for all humankind.

further resolves that

1. Protection of the astronomical quality of areas suitable for scientific observation of the Universe should be taken into account when developing and evaluating national and international scientific and environmental policies, with due regard to local cultural and natural values.	

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The 2008 Annual Report of the

International Space Exploration Coordination Group

Released March 2009

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International Space Exploration Coordination Group Annual Report: 2008

Introduction

This second Annual Report of the *International Space Explor ation Coordination Group* (ISECG) and its sub-working groups provides highlights of their activities during the past twelve-months including the progress of its Workplan, work ahead, the major space exploration accomplishments of its members including future opportunities, and progress in implementing the Themes described in *The Global Exploration Strategy: The Framework for Coordination*.

In addition, this ISECG Annual Report, as with the 2007 edition, provides an opportunity for agencies to update the international community on their individual space exploration plans – this information will be found in the Annex.

The Annual Report is intended to keep all exploration stakeholders, including other exploration related coordination groups, better informed of the ISECG's work and progress implementing the Global Exploration Strategy Framework document.

Efficient, beneficial and public supported Space Exploration can only be accomplished as an international endeavour involving a diverse stakeholder community comprising; space agencies and their policy/funding governments, industry, scientific institutions, academia, and non-profit groups. The ISECG is facilitating this dialogue and understanding.

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Part 1 The Role of the ISECG

1.1 Overview

The International Space Exploration Coordination Group (ISECG) was born out of The Global Exploration Strategy: The Framework for Coordination (GES or Framework Document) that was prepared by fourteen space agencies and published in May 2007. The GES elaborates a vision for the peaceful robotic and human space exploration, including a common set of key space exploration themes, focusing on destinations within the Solar System where humans may one day live and work. This focus on human activity puts low-Earth orbit, the Moon, and Mars into particular focus of the ISECG. The Framework Document also established the framework for the creation of the ISECG.

The GES/Framework Document was clear concerning the Principles and Resulting Requirements that would govern the ISECG. The guiding Principles are:

- Open and Inclusive (open to any agency with a vested interest in space exploration)
- Flexible and Evolutionary (to meet changing needs and circumstances)
- Effective (work to an agreed Work-Plan with deliverables useful to all stakeholders)
- Mutual Interest (meet the needs of all stakeholders)

The Terms of Reference (TORs) for the ISECG were formally adopted at the first meeting of the ISECG held in Berlin in November 2007. The primary purpose of the ISECG is to provide a forum for space agencies to discuss their interests, objectives and plans in space exploration with the view to working collectively towards the further development and implementation of the entire scope of the Global Exploration Strategy set out in the Framework Document. The expected benefits of this coordination are to increase robustness, safety and cost effectiveness of individual and collective exploration goals, and to facilitate the ability of participating agencies to engage in productive bilateral or multilateral discussions, while preserving their autonomy. This will contribute to strengthening the sustainability of global space exploration. In addition the ISECG will strive to promote interest and engagement in space exploration activities throughout society worldwide.

The scope of the ISECG activities are broad and strategic, and focused on developing non-binding findings, recommendations and other outputs as necessary for use by participating agencies. In this regard the ISECG is different from other similar groups. The latter, such as the International Mars Exploration Working Group, having a more destination or discipline focus. Importantly, it is not the intent of the ISECG to either duplicate the work or govern the work of other coordination groups, but rather to "work with" them to ensure that ISECG Workplan activities are being covered.

¹ In alphabetical order: ASI (Italy), BNSC (United Kingdom), CNES (France), CNSA (China), CSA (Canada), CSIRO (Australia), DLR (Germany), ESA (European Space Agency), ISRO (India), JAXA (Japan), KARI (Republic of Korea), NASA (United States of America), NSAU (Ukraine), Roscosmos (Russia). "Space Agencies" refers to government organizations responsible for space activities.

From the outset it was agreed that the ISECG would perform its work through an agreed Workplan with each activity being undertaken by a working-group comprising members with a particular interest and expertise in the subject. The Workplan is updated periodically as required such that it is always current, i.e., it is not an annual Workplan. Each Working-Group has a concrete deliverable(s). The ISECG and its Working Groups meet regularly via teleconference, as well as face-to-face meetings, and the ISECG meets in Plenary at least once a year. During the Plenary session agencies share the latest developments in their exploration programs and review the progress of the Workplan Working Groups. The ISECG is supported by a small permanent Secretariat, provided by ESA.

The second meeting of the ISECG was held in Montreal, Canada in July 2008 and the third meeting was held in Yokohama, Japan in March 2009.

For more information on the ISECG, its publications and for Agencies to request membership please contact the ISECG Secretariat at: Raffaella.Pappalardo@esa.int. The ISECG will soon have a dedicated website.

1.2 Working Groups of the ISECG

The ISECG accomplishes its tasks throughout the year through the work of several working groups. These working groups are introduced below, and in some cases described in more detail in corresponding sections of this report.

1.2.1 Enhancement of Public Engagement

This Working Group, led by DLR, is identifying the key elements for public engagement that could be used by participating Agencies to promote exploration.

1.2.2 Establishment of Working Relationships with Existing International Working Groups

As already mentioned it is not the intent of the ISECG to either duplicate the work or govern the work of other coordination groups, but rather to work with them to ensure that ISECG Workplan activities are being covered. This Working Group, led by CNES, has identified those international bodies of particular relevance to the ISECG and is ensuring that these groups are familiar with the work of the ISECG – the ISECG Annual Reports are one informing mechanism.

In addition the ISECG has identified areas, which would greatly benefit from close contact between ISECG and existing working groups. Examples of such activities include:

- (a) development of exploration data archiving and distribution standards as might be addressed by the International Planetary Data Alliance,
- (b) development of standards to support space exploration communications interoperability as are being addressed among those agencies actively planning spacecraft beyond Low Earth Orbit, the Space Frequency Coordination Group, the Interagency Operations Advisory Group and the Consultative Committee on Space Data Systems,

(c) development of a common Lunar cartographic reference system as might be undertaken by the International Lunar Exploration Working Group, the International Astronomical Union (IAU)/IAG Cartographic Working Group and the International Planetary Data Alliance (IPDA).

1.2.3 The <u>International Space Exploration Coordination Tool (INTERSECT)</u>

The development of INTERSECT is led by CSA and ESA, and it will serve the ISECG members as web-based/interactive data base. Its purpose, when fully developed and maintained, is to provide a single reference source for ISECG members. This is further described in the beginning of Part 3.

1.2.4 The Space Exploration Interface Standards Working Group (ISWG)

This Working Group, led by NASA, is identifying the key exploration element interfaces recommended to be common, and of priority, that would maximize opportunities for international cooperation in an open architecture environment. The work of this Working Group is further described in Section 3.3.

1.2.5 Mapping the Space Exploration Journey

A human mission to Mars is surely a long-term objective in our collective future. However, there is a great deal of work that lies ahead before the community of space explorers could execute such a mission. In 2008, Germany (i.e. DLR) proposed the ISECG accept a task related to Chapter 3 of the Framework Document, "Mapping the Space Exploration Journey." The objective of this new ISECG task, Mapping the Barriers to Robotic and Human Exploration, would be to identify the significant, known technological and operational challenges associated with extending human presence to various destinations in the Solar System.

Part 2 Current and Near-Term Activities of ISECG Members

The year 2008 saw a great deal of activity in all areas of space exploration. Spacecraft that recently arrived at the Moon continued their investigations of the Earth's natural satellite, and spacecraft at Mars continued unabated on their course of exploration that has been ongoing for several years. Also, in 2008 plans were solidified for new missions in the solar system, and, importantly for the ISECG, exploration in the near-Earth neighborhood.

2.1 Low Earth Orbit (LEO)

2.1.1 The International Space Station (ISS)

This past year, 2008, was a milestone year for the ISS. It marked the 10th anniversary of on-orbit operations, Zarya, a Russian built U.S. control module, was the station's first component. NASA completed four space shuttle missions, which included the, much awaited, launch of the European Columbus and Japanese Kibo laboratories and the Dextre two-armed robot, the final element of Canada's robotics contribution. Europe accomplished a highly successful six-month maiden mission of its first Automated Transfer Vehicle Jules Verne to the ISS. Also, with the activation of the Japanese and European elements 2008 marked the beginning of new fully operational spaceflight control centers in Germany, France and Japan that are working closely with existing control centers in the U.S., Russia and Canada. These flights also prepared the station to house six-crew members beginning in 2009 and for the arrival of Kibo's attached unpressurized exposed facility (for external scientific payloads).

In the decade since Zarya arrived in orbit, the station has grown to become the largest spacecraft ever built. Its mass has expanded to more than 313 tons, and its interior volume is more than 25,000 cubic feet/708 cubic meters. The station now hosts 19 research facilities, including nine sponsored by NASA, eight by European Space Agency and two by Japan Aerospace Exploration Agency. Fully utilizing the International Space Station is now a primary goal of all the ISS partners.

2.1.2 Emerging Government Capabilities

China has become only the third nation to have an autonomous human space flight capability. Their 3rd mission in October 2008 moved them one step closer to a full capability with a successful mission that included an extra vehicular activity with a Chinese EVA suit.

The NASA Constellation program comprises all vehicles and systems that will form the next generation U.S. crew and cargo transportation system for human space exploration. The initial elements of the Constellation Transportation Architecture are the Ares I crew launch vehicle and the Orion crew exploration vehicle. The Orion will replace the Shuttle for the transportation of four to six crew and small payloads to the ISS beginning in 2015. The Ares-I achieved a major milestone in 2008 with a successful Preliminary Design Review.

2.1.3 Emerging Commercial Providers

In recent years a new industry has been added to the lexicon of industries. Referred to as *New Space*, this industry is currently dominated by entrepreneurial firms with a focus on Space Tourism and commercial transportation services to LEO for government customers.

A leader in the entrepreneurial area is Virgin Galactic – a partnership between the firm Scaled Composites and Richard Branson's Virgin Group. Scaled Composites was the winner of the Ansari X-Prize, demonstrating the ability to launch and return a human into suborbital flight twice within two weeks with the same launch system. Scaled Composites is now building WhiteKnight Two and SpaceShipTwo as part of the Virgin Galactic enterprise; SpaceShip Two will be capable of taking six paying passengers into space. Other players in the space tourism business include Space Adventures, perhaps the first space tourism company, who broker short duration missions for paying customers (four to date at approximately \$30m each) to the ISS on Russian Soyuz vehicles; and Bigelow Aerospace, which is developing inflatable Earth orbiting habitats that may one day be available as a space tourist destination. Thus far Bigelow Aerospace has successfully deployed two engineering prototypes.

The California-based SpaceX, is developing a family of new, low-cost launchers. The fourth launch of their first vehicle, the Falcon 1, in September 2008 was a success. SpaceX and Orbital Sciences Corporation are both participants in the NASA Commercial Orbital Transportation Services (COTS) program – NASA is awarding a total of \$500 million between the two companies for the successful demonstration of cargo transportation capabilities to LEO. At the end of 2008 NASA awarded contracts to both SpaceX and Orbital for commercial cargo services to the ISS.

Another X-Prize that is encouraging the development of commercial activities on the Moon is the Google-Lunar X-Prize that will award a total of US\$30m to the team(s) that can land a rover on the Moon and transmit data back to Earth.

2.2 Beyond LEO – The Moon and Mars

2.2.1 **Moon**

Lunar scientific exploration will involve three types of investigations: science 'of the Moon', science 'from the Moon', and science 'on the Moon'. Science 'of the Moon,' which involves lunar geology, geochemistry and geophysics, will help us understand the history of the Moon. The Moon is an invaluable witness to much of solar system history. It has recorded this history more completely and more clearly than any other planetary body. During 2008 three spacecraft were orbiting the Moon carrying out a variety of measurements. These are Japan's Selene-1 (or Kaguya), China's Chang'e - 1, and India's Chandrayaan-1. China's Chang'e-1 completed its mission in February 2009.

Launched in September 2007, Kaguya includes the most comprehensive suite of instruments yet sent to study the Moon, a total of fifteen instruments on three total spacecraft:a main orbiting satellite at about 100km altitude and two small data relay satellites in polar orbit. The Kaguya High Definition Television (HDTV) captured on video for the first time a full Earth Rise over the

Moon – an image that will undoubtedly be the 21st Century's equivalent of the Apollo "Earthrise" still photograph. Launched in October, 2007 Chang'e 1 is China's first planetary probe to the Moon. And launched in October, 2008 Chandrayaan-1 is a complex spacecraft with eleven instruments including instruments from Europe (ESA), United States (NASA) and Bulgaria.

Though they have their own individual mission goals and designs, there are notable overlaps in their objectives. These overlaps include the collection of high-resolution data to create a chemical and mineralogical map of the Moon's interior, search for sub-surface water at the lunar poles, and to develop a high resolution three-dimensional topographical map of the lunar surface on both the near and far sides. By searching for elements like Magnesium, Aluminium, Silicon, Calcium, Iron, and Titanium while creating a detailed map of the lunar surface scientists can answer questions about the Moon's origin and geological evolution and how that relates to the evolution of the Earth.

In 2009 (schedule is April) NASA will launch its Lunar Reconnaissance Orbiter (LRO) with a surface impactor, the Lunar Crater Observation and Sensing Satellite (LCROSS). These spacecraft will join their international counterparts mapping and characterizing the lunar surface and geological structure. Following LRO from NASA will be the Gravity Recovery and Interior Laboratory (GRAIL) and the Lunar Atmosphere and Dust Environment Explorer (LADEE), both planned for launch in 2011. GRAIL will fly twin spacecraft in tandem orbits around the Moon for several months to measure its gravity field in unprecedented detail, and LADEE will orbit the Moon whose main objective is to characterize the atmosphere and lunar dust environment.

The creation of detailed maps of the lunar surface and subsurface is necessary to enable a second phase of lunar exploration to take place in the next decade. Japan, India, and China will all be sending landing spacecraft to the Moon, all likely to include a rover, to do further studies of lunar regolith and to characterize the environment of the Moon at its location in inner solar system. Selene II, Chandrayaan II, and Chang'e 2 will join LADEE and GRAIL in the next decade to make the Moon the most internationally visited location in the solar system. The scientific investigations of the orbiters currently at the Moon will provide information about where to send a lander to maximize the return on its scientific endeavors; the detailed maps they will help identify specific, safe landing locations for those landers. For NASA in particular a detailed map of the lunar surface will help identify safe landing locations for the Altair lunar lander (one of the elements of NASA's Constellation program i.e. the next generation crew and cargo vehicles).

2.2.2 Mars

Mars is a key focus for space exploration because the planet is relatively close and it has resources that may aid human exploration, an atmosphere, diverse minerals, and water. Better knowledge of Mars would help us understand Earth's history and evolution. The scientific exploration of Mars is motivated by the search for life; in the past or present. Did life ever exist on Mars? Will Mars be able to support human life and exploration in the future? These are the questions that drive Mars exploration with current investigations centered around Martian climate and geology. While there is no clear evidence of liquid water on the surface of Mars today, the record of past water activity can be found in the rocks, minerals, and geologic

landforms. Spacecraft at Mars map mineralogical and geomorphological features, providing clues to environmental conditions, and delineating sites evincing interaction with liquid water, which may have been conducive to life.

There are currently five spacecraft exploring Mars, three from orbit and two on the surface. In orbit are the U.S. Mars Odyssey (launched in 2001), ESA's Mars Express (launched in 2003), and the U.S. Mars Reconnaissance Orbiter (launched in 2005). In addition, since January 2004 two US rovers (Spirit and Opportunity) have been roving on Mars. The rovers were joined on the Martian surface in May 2008 by the U.S. Mars Phoenix lander, which performed superbly until the onset of the polar winter.

Mars Odyssey was the first mission to map the elemental composition and minerals of the near surface. The Mars Reconnaissance Orbiter has been successfully providing high-resolution spectral images of the Martian crust, mapping the distribution of minerals seen in the near infrared, and creating planetary-scale maps of critical atmospheric properties. Mars Express has been exploring the interior, surface, and atmosphere of Mars. It as produced high-resolution images, ionosphere and sub-surface sounding measurements, detection of methane, mineralogical data and information concerning the composition of the icecaps. The Mars Exploration Rovers Spirit and Opportunity offer unique contributions as roving robotic geologists in pursuit of the science strategy to "Follow the Water." For 5 years they have travelled the surface of Mars for more than 10km each, collecting samples of soil and finding clues to past water activity on Mars. The complement of the Phoenix spacecraft (which completed its mission near the end of 2008) and its scientific instruments were ideally suited to uncover clues to the geologic history and biological potential of the Martian arctic. Phoenix was the first mission to return data from either polar region. It used a robotic arm to dig through the protective topsoil layer to the water ice below and ultimately, to bring both soil and water ice to the lander platform for sophisticated scientific analysis.

These spacecraft have effectively investigated the whole planet, and scientists have made significant discoveries. They have found sub-surface water and water ice at the poles, evidence of surface water and ground water interactions in the equatorial latitudes, and gases like methane in the atmosphere. Ground observations of methane show it to vary in time and space – requiring an active source and rapid removal mechanism. This variablity suggests that the planet is still alive, at least in a geologic sense, and that perhaps the biological processes of microbial life are responsible for the release of the methane. If microscopic Martian life is producing the methane, it likely resides far below the surface, where it is still warm enough for liquid water to exist.

In the next decade there will be several more missions that will continue the scientific exploration of Mars. There are currently two U.S. missions in development. First is the Mars Science Laboratory, planned for launch is 2011. The Mars Science Laboratory will use a long-duration rover and 10 payload elements for definitive mineralogical and organics measurements, assessing the habitability of Mars for past or present life. Second is a Scout-class (small <\$500m) mission called MAVEN, an orbiter that will provide information about the current state and processing affecting the composition of the atmosphere and its evolution through time. It is scheduled to launch in 2013.

In 2016 ESA plans to launch its ambitious ExoMars mission. ExoMars science objectives are to search for evidence of past or present life, characterize the water/geochemical environment including the collection of samples down to a depth of 2 meters, identify potential hazards to future human exploration, and investigate the subsurface and deep interior to better understand the planet's evolution and habitability. It will be the first European mission to demonstrate advanced technologies for Entry, Descent and Landing, and will be the first European mission to employ a surface rover, as well as a Drill and Sample Preparation and Distribution System.

The first joint Chinese-Russian mission to the Martian Moon Phobos is set to launch in October 2009. It should reach the red planet in August 2010. A Russian Zenit rocket will launch a Chinese Yinghuo-1 satellite and a Russian Phobos-Grunt lander. Phobos-Grunt is expected to study Mars from orbit, including its atmosphere and dust storms, plasma and radiation, before landing on Phobos The mission's objectives are to collect soil samples from Phobos, and to bring the samples back to Earth for comprehensive scientific research. Rososmos and ESA agreed to use the communications payload onboard of Phobos-Grunt to support the ExoMars mission. In return ESA, agreed to provide its ground control network for telemetry, tracking and flight control needs of the Phobos-Grunt mission. ESA also helped to plan the Phobos-Grunt mission. The Mars Express camera took high-resolution images of the potential landing sites on Phobos.

Part 3

Progress in 2008 towards Opportunities for Integrated and Collaborative Space Exploration

Part 2 offered a brief overview and summary of current and near-term exploration missions built and launched by individual space agencies. While each mission may have instruments or components provided by international partners, like NASA instruments on India's Chandrayaan I, each can legitimately be thought of as a *national* mission. Cooperation on national missions and cooperation in fully integrated or shared missions will be enhanced with the utilization of the ISECG's <u>International Space Exploration Coordination Tool</u> (INTERSECT). INTERSECT will provide integrated and validated information on international space exploration plans, associated exploration capabilities and systems, and related agencies exploration goals. INTERSECT will greatly enhance agencies' ability to identify areas for cooperation, and help inform their own national space exploration architectures to ensure the sum of the whole is greater than the individual parts. In sum, INTERSECT will facilitate communication among agencies to identify more collaborative and integrated exploration efforts.

With respect to robotic missions, two types of such collaborative exploration are under discussion: network science missions, and integrated joint development missions. Human exploration of the Moon also creates an opportunity for integrated international exploration. In 2008 significant progress was made in these areas, and though it is early progress it is the necessary foundation for eventual mission success.

3.1 Robotic Network Science – The International Lunar Network

In March 2008 NASA proposed the concept of the International Lunar Network (ILN) to the international community at the Lunar and Planetary Science Conference. Investigations, which require multiple, simultaneous measurements from more than one surface site are referred to as *network science*. The ILN aims to provide an organizing theme for all landed science missions in the 2010s by involving each landed station as a node in a geophysical network.

In the ILN concept, each node would include some number of "core" capabilities or sensors e.g., seismic, heat flow, laser retro-reflectors. Individual nodes could and likely would carry additional, unique experiments to study local or global lunar science. Such experiments might include atmospheric and dust instruments, plasma physics investigations, astronomical instruments, electromagnetic profiling of lunar regolith and crust, local geochemistry, and in situ resource utilization demonstrations.

Since March several ISECG agency members have been participating in ILN Working Group discussions to define the network's core measurements, enabling technologies, and communications requirements to ensure the inclusion of nodes on the far side of the Moon. On July 24, 2008 a meeting of the space agencies of Canada, France, Germany, India, Italy, Japan, the Republic of Korea, the United Kingdom, and the United States was held at NASA's Lunar Science Institute, located at the Ames Research Center. During the meeting, the representatives of the nine space agencies, mentioned above, discussed cooperation on ILN and agreed on a statement of intent as a first step in planning.

If the ILN is successful it will demonstrate the feasibility of network science for the geological study of Mars.

3.2 Joint Development for Robotic Exploration – Mars Sample Return

A Mars Sample Return (MSR) mission has been at the top of many international priority lists for Mars science. In 1993, the international community established the International Mars Exploration Working Group (IMEWG) to provide a forum for the coordination of Mars exploration and develop an international strategy. It has long been recognized that a MSR mission would be so complex as to have high development costs and high implementation risks. In order for such a mission to be feasible, it would be necessary to share the costs and risks among multiple international partners. In May 2006 IMEWG chartered a specific working group to examine the feasibility of an international MSR mission. This working group began its efforts in September 2007 under the name iMARS – international Mars Architecture for the Return of Samples.

The iMARS working group released a Phase 1 report in June 2008 that among other topics summarized international mission architecture options and identified technology development milestones to accomplish a multinational MSR mission. The report in full is titled "Preliminary Planning for an International Mars Sample Return Mission: Report of the iMARS Working and Group." be found at the following website: http://mepag.jpl.nasa.gov/reports/index.html#IMEWG. The iMARS team had thirty-one participants from ten different countries² broken into three sub-teams focusing on engineering requirements, science objectives, and facilities needs for the study of returned samples. The team analyzed five mission architecture scenarios and produced a reference architecture approach that includes two elements launched separately: one carrying an orbiter that includes the Earth return system and one with the landed components including a sample-acquisition rover and the Mars ascent vehicle that launches the sample from Mars' surface. The reference architecture also includes recovery and containment after Earth entry and one or more Sample Receiving Facilities.

One benefit of the iMARS effort is that it sheds light on the many difficult questions that have to be answered in carrying out a truly integrated international mission, questions beyond the technical issues of where to land on Mars and what samples to collect. Questions having to do with program management protocols, funding mechanisms, task allocation for each piece of the mission architecture, and science oversight are all subject to inquiry. The development of the reference architecture for MSR was only step one in a multistep process for IMEWG and iMARS, but if there is ever to be a successful MSR mission then this first step, taken together by an international community, may prove to be the most important.

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² Australia, Belgium, Canada, France, Italy, Japan, Sweden, Switzerland, United Kingdom, United States plus the European Space Agency.

3.3 Collaborative Human Exploration of the Moon

Described briefly in Section 2.1.2 the NASA Constellation Program is leading the development of a new fleet of U.S. transportation vehicles to enable space exploration beyond LEO. In addition to the Ares I and Orion vehicles, already mentioned, NASA is developing the Ares V cargo launch vehicle and the Altair lunar lander. Together, these vehicles will all be used to transport human crews to the Moon no later than 2020, and will be part of missions to explore beyond in coming decades.

NASA completed its first important milestone for lunar exploration, a Lunar Capability Concept Review (LCCR) in June 2008. The three-day LCCR capped a nine-month study that looked at possible lunar mission scenarios and compared them to the capabilities of the Ares V and Altair. The review refined early configurations of the Ares V rocket to ensure its capability to deliver the Altair lunar lander, four astronauts and cargo anywhere on the Moon and return the crew to Earth at any time. The Ares V will be able to send more than 156,600 pounds/71,000 kilograms of cargo and components into orbit to the Moon. Altair will be capable of landing four astronauts anywhere on the Moon, providing life support for the first weeklong surface exploration missions. A variant of the lunar lander will serve as an autonomous cargo carrier, taking modular outpost components, lunar rovers, and scientific equipment to the Moon's surface.

These NASA provided transportation elements cannot comprise the full suite of systems operating on the Moon if human lunar exploration is to have a sustainable future. To sustain human presence beyond Earth, we should learn from science 'on the Moon' how to live and work on other celestial bodies. To do so will take time and experience, and much like the MSR mission there will be significant cost and risk, almost requiring international collaboration as a result. Recognizing this fact NASA worked with ISECG members to create in early 2008 the space exploration International Standards Working Group (ISWG) introduced in paragraph 1.2.4. This working group will first take on the task of identifying the key exploration element interfaces recommended to be common, and of priority, that would maximize opportunities for international cooperation in an open architecture environment.

In order to identify these interfaces, the ISWG is preparing a number of lunar surface exploration scenarios and associated surface elements for transportation, habitation, and scientific investigations. It will be the forward work of the ISECG participants to add to the tasks of the ISWG an agreed to slate of science objectives to be accomplished via a human presence at the Moon, and, to identify the best way for human activity at the Moon to inform preparation for an eventual human mission to Mars. Building on this work, the ISWG in 2009 will outline, an international surface exploration reference architecture and begin to identify what all the various ISECG members can contribute to the long-term human exploration of the Moon. This will be about a two-year effort, and in keeping with the general timeline when agencies will have completed their conceptual studies for a Lunar Surface Architecture.

3.4 An Eventual Human Mission to Mars

For several years NASA and ESA have independently examined the complexities of a human mission to Mars and have identified many of the technical barriers that currently exist. In 2008 ESA presented several of its conclusions about the requirements for a human mission to Mars at its Exploration Conference in July, and NASA finalized its Mars Design Reference Architecture 5.0. A brief review of either agency's work would show that the primary source of humans-to-Mars challenges is the time requirement, with missions lasting in excess of 500 days and transportation to and from Mars taking approximately 180 days each way. The challenges that fall out of such a mission profile can fall into at least five categories, including transportation and propulsion, power and thermal, habitation, human protection, and technology development.

Much can be learned in these areas by utilizing the Moon as a proving ground. As was stated in the Framework Document, *The Moon, as our closest 'natural space station,' is the ideal place for humanity to develop the capabil ity to journey to Mars and beyond.* Consider the need to provide for a safe and effective long-duration mission with exposure to the Mars radiation and solitary environment. A successful human mission to Mars will require the long-duration performance of countermeasure equipment and protocols, medical diagnosis and treatment equipment, and long-term food storage. As a proving ground, the Moon can validate the efficacy and performance of countermeasure equipment, validate and demonstrate medical equipment, and validate food systems and habitat human factors.

It is the forward work of the ISECG to use much of the work carried out by individual agencies or small groups of agencies as a foundation for more collaborative roadmapping of the way forward in space exploration. Such a roadmap would identify the kinds of challenges described above and identify scenarios by which an international community can meet these challenges. The first version of INTERSECT and an interim report from the ISWG will be the foundation of such a long-term roadmap.

Part 4 Summary and Way Forward

The Global Exploration Strategy: The Framework for Coordination published in 2007 articulated the following Themes for the international exploration of space:

- New Knowledge in Science and Technology
- A Sustained Presence Extending Human Frontiers
- Economic Expansion
- A Global Partnership
- Inspiration and Education

The ISECG Annual Report 2008 shows that much progress has been achieved in all these themes by space Agencies, individually, through collaborative activities and collectively facilitated by existing international groups, including the ISECG.

New Knowledge in Science and Technology

New knowledge derived from lunar and Mars missions (see paras 2.2.1 and 2.2.2)

- Chandrayaan orbiter mission
- Kaguya orbiter mission (see also JAXA Exploration Highlights in Annex)
- Chang'e 1 orbiter mission
- Several Mars orbiting and landed missions including Phoenix in 2008 (see also NASA Exploration Highlights in Annex)

New capabilities developed for human exploration (see para 2.1.2)

- 1st successful flight of ATV mission to ISS (see ESA Exploration Highlight in Annex)
- Attachment of Columbus laboratory to ISS (see ESA Exploration Highlight in Annex)
- EVA capability demonstrated during 3rd Shenzhou mission
- PDR of ARES I successfully completed (see NASA Exploration Highlights Highlight in Annex)

A Sustained Presence – Extending Human Frontiers

10th year of on orbit operations onboard ISS (see para 2.1.1)

Economic Expansion

Emerging commercial capability providers (see para 2.1.3):

- Demonstration of commercial suborbital transportation capabilities by Virgin Galactic/Scaled Composites
- Successful launch of Falcon 1launcher by Space X
- Successful deployment of prototype inflatable habitats by Bigelow Aerospace

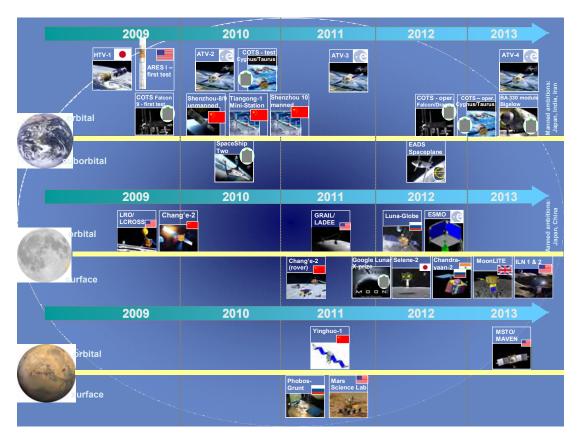
A Global Partnership

- Development of prototype of International Space Exploration Coordination Tool (INTERSECT) for information exchange on planned missions and capability developments by the ISECG (see para 1.2.3)
- Initiation of International Lunar Network (ILN) initiative by NASA (see para 3.1)
- Development of a reference architecture for Mars Sample Return mission by iMARS working group which is subordinated to the IMEWG (see para 3.2)
- Initiation of work on an international reference architecture supporting human missions to Moon by the Interface Standards Working Group which is subordinated to the ISECG (see para 3.3)

Inspiration and Education

Initiation of a working group for coordination of public engagement activities by ISECG (see para 1.2.1)

The future exploration plans of space Agencies demonstrate a shared ambition to further progress in the implementation of the Global Exploration Strategy. ISECG will continue to provide a platform for early information exchange between these Agencies for coordinating plans and identifying opportunities for international cooperation.



ISECG will specifically address the following objectives throughout 2009:

- Better understand global exploration objectives and means of achieving these objectives through collaboration;
- Finalize the development of a tool for sharing information on space Agencies exploration plans, including future missions and capability developments;
- Progress in the development of a reference architecture enabling the implementation of internationally developed mission scenarios for human lunar exploration and derive from the architecture priorities for the development of international interface standards;
- Raise awareness of the ISECG role and products among relevant stakeholders and establish working relations with other existing international working groups for mutual benefits;
- Develop a global strategy for conducting effective public engagement as an important pillar for sustained exploration;
- Explore opportunities and barriers for private sector engagement in global exploration;
- Map the Barriers to Robotic and Human Exploration and identify the significant, known technological and operational challenges associated with extending robotic and human presence to various Solar System destinations.

Results achieved on these objectives will be reported in the ISECG Annual Report 2009 and presented at major upcoming international conferences, including the International Astronautical Congress which will take place in Daejong Korea in October 2009.

ANNEX I

HIGHLIGHTS of SPACE AGENCIES' EXPLORATION ACTIVITIES

ASI/Italy Exploration Highlights

Introduction

The year 2008 has been characterized, for Italy as for the other ESA Member States, by the Ministerial Council held in November, hosted in Den Haag (The Netherlands) and chaired by Italy. During this event, Italy reaffirmed its leadership on the robotic mission ExoMars to be launched to Mars in 2016 and confirmed its commitment for its contribution to the European exploitation of the International Space Station.

It is worth noting that the Italian MPLM module Leonardo flew on the Shuttle mission STS126, launched on November 14th. Outstanding scientific results have been collected by the Italian instruments on-board the NASA Mars Reconnaissance Orbiter and ESA Mars Express missions. Last, in the framework of an AO for small missions, a lunar orbiter has been selected and the phase A study of such mission named MAGIA has been performed.

Past significant events and missions

Hereafter are reported the significant events related to exploration during the past year:

- Human exploration

- MPLM Leonardo flight on Shuttle mission STS126. Leonardo is one of the three Multi Purpose Logistics Modules build in Italy under a NASA-ASI agreement and used to bring up to seven tons of material, to the ISS.
- o ELITE-S2 (ELaboratore Immagini TElevisive for Space 2nd edition): P/L developed to understand the effect of medium/long duration space flight on human task performances over time. This experiment has been carried out for 32 hours astronaut time during 2008 on ISS.
- o Life Support System activities (CAB Controllo Ambientale Biorigenerativo).

- Robotic exploration

- Operations, data acquisition and analysis of Italian instruments on-board ESA Mars Express (MARSIS and PFS) and NASA MRO (SHARAD) missions. In particular, images provided by the radars allowed scientists to infer that the crust and the upper mantle of Mars are stiffer and colder than previously estimated and large deposits of ice have been identified at low latitudes.
- o Together with European partners, pre-PDR and PDR activities of ExoMars (Prime Contractor TAS-I) and PDRs of the Italian P/Ls (4 PI instrument plus contribution to other 5).
- o Completion of the joint feasibility study performed together with JAXA on the possibility to launch the Hayabusa-2 mission with the VEGA launch vehicle.

- Earth based activities

- o Prosecution of the activities related do the development of a field infrastructure in Morocco for field testing for robotic Mars exploration technologies (rovers mobility/long distance traverses, navigation, remote control, instruments operations, landing systems procedures, technologies).
- Strong participation to the ESA Aurora Core Programme (architecture studies, MSR preparation studies, and activities related to general exploration technologies and preparation for Lunar exploration).
- The development of a GIS (Geographical Information System) for Mars called PAGIS (Planetary Geosciences Information System) to elaborate and produce thematic maps is ongoing.

- o Participation to the GES activities, IMEWG activities (in particular the MSR WG activities) and signature of the ILN SoI.
- o The Italian astronaut Paolo Nespoli, as crew member of Expedition 26 to ISS, has been assigned for a launch in November 2010 on Soyuz 25 and return in May 2011 on Soyuz 25.
- o An Italian Bed-Rest campaign of 7 weeks has been performed in Slovenia in head down (-6°) modality to simulate the physiological effects of microgravity on the human muscle-skeletal, cardiovascular and renal systems. The analyses of the results are ongoing.

Upcoming events

2009 will be an important year for Italy, as for the other countries part of the EU because of the Exploration Conference scheduled in June in Prague where the role of Europe in Exploration will be discussed. Also at national level, two out of five of the small missions selected in the 2008 AO will be selected for development and one of the mission in competition is the lunar orbiter previously mentioned. The MDS experiment (Mice Drawer System) is scheduled on flight 17A (August 2009) to ISS. Roberto Vittori will be assigned for launch in 2010 on the Shuttle.

Conclusion

Italy is strongly involved in robotic and human exploration activities. Currently our main objective is the participation to the Mars Sample Return mission and the utilization of the ISS. At the same time, we are still aiming at enhancing our expertise in the following fields: robotics systems, pressurized modules and life support systems.

BNSC/United Kingdom Exploration Highlights

Introduction

In addition to its participation in ESA's Aurora Programme the UK is actively considering how to more widely engage in space exploration activities. Civil space activities in the UK are coordinated by the British National Space Centre (BNSC), a partnership of government bodies with involvement in space. The partner responsible for space exploration is the Science and Technology Facilities Council (STFC).

Highlights

The successful launch of India's Chandrayaan-1 spacecraft carried the UK's Chandrayaan-1 X-ray Spectrometer (C1XS) into orbit around the Moon. By early December it had taken its first successful measurements of the composition of the Moon. The instrument is part of ESA's contribution to Chandrayaan-1 and is an improved version of the demonstration model flown on ESA's SMART-1 spacecraft.

The main thrust of the UK's space exploration activities continues to be through ESA's Aurora programme. At the ESA Ministerial Conference in November 2008, the UK committed to an increase in its subscription to the ExoMars project from €01M to €65M and decided to commit funds to the ESA Mars Robotic Exploration Preparation programme (currently some 25% of the total funds subscribed).

The new *UK Civil Space Strategy 2008-2 012 and Beyond*, published in February 2008 (see http://www.bnsc.gov.uk), demonstrates an increased commitment to space exploration. The actions it sets out include following up the Space Exploration Working Group report (published in 2007, see http://www.stfc.ac.uk/UKSEWG) to produce a programme of activities that can be proposed to government for funding. This study is expected to be complete in the spring of 2009. The terms of reference of this study may be found on the BNSC web site (http://www.bnsc.gov.uk).

BNSC has also been working closely with NASA, considering areas of lunar research on which to cooperate. The final report of a Joint Working Group on lunar exploration was published in 2008 and identifies possible joint projects. These could include the Moon Lightweight Interior and Telecoms Experiment (MoonLITE) mission that would see the deployment of a series of penetrators to conduct measurements on the Moon as well as the joint development of science and technology needed for midterm robotic and human exploration activities. The MoonLITE orbiter would act as a telecommunications station between the surface network and the Earth, relaying information to the Earth during the penetrators' one-year life. After that time it could act as a general-purpose communications relay. Following international peer review, STFC has now given approval for a 'Phase A' technical study to establish the feasibility of the overall mission, the penetrators and the penetrator descent systems.

During 2008, the UK has also developed a new strategy for its involvement in Mars Sample Return that sets out to provide expertise for a sample curation facility, develop technologies for a fetch-rover based on the UK-led rover for ExoMars and to provide instrumentation for sample selection.

As part of its commitment to increase the impact of space on education, BNSC has ran a series of high-profile competitions related to exploration during 2008. School children were invited to propose science experiments to be carried out by British-born space participant, Richard Garriott, during his visit to the ISS in October and to propose novel space exploration enterprises.

CNES/France Exploration Highlights

Introduction

As already mentioned, the main contribution of France to the exploration activities is through ESA's programs. However CNES is meanwhile developing complementary activities by providing instruments to the ESA's programs and by supporting the French scientific laboratories.

2008 Highlights:

In 2008 the political dimension of Exploration has been really emphasised in France at three different occasions:

• **Kourou 02/11/08**: During his first speech on the French Space Policy the French President recognized the importance of Space Exploration, robotic and human ("I believe we cannot dispute the desire to extend our presence in the Universe as far as our technological prowess and the courage of pioneers will take us")

The President proposed key references for the French vision for Exploration, based on the GES namely:

- -"We should work together to establish the framework for a dialogue with the US and other space powers to structure our efforts."
 - "Europe's role is to offer to form a responsible partnership, leveraging our respective strengths, to build a joint project. And naturally, other space powers with a real engineering and financial contribution to offer, and with a real desire to cooperate, could join the partnership."
- Kourou 07/2 1/08: During the French Presidency of the European Union, the French government took the initiative of gathering together the 27 European Ministers in charge of Space (including ESA and the EC). They came to the conclusion that Exploration is of such paramount importance for Europe that a real political commitment should be taken at highest political level. Therefore a dedicated conference will be organised soon with European decisions makers to define the European vision for Exploration.
- Den Haag 12/24/08: At the Esa's Ministerial Council, France reaffirmed its position on Exploration by supporting its two major priorities: The ISS Utilisation both for science and as stepping stone for the preparation of the next European contribution to human exploration as well as Exomars.

The European Union's next Conference on Exploration in Prague next spring will highlight the direction France and Europe will take at their respective level.

CSA/Canada Exploration Highlights

Introduction

For Canada, the year 2008 could be characterized as the launch-year for in-depth technical studies of potential Canadian contributions to international space exploration initiatives, in addition to pursuing current activities in space exploration on the ISS and missions to Mars. Space in general and space exploration in particular has received renewed attention both from the government and the media.

2009 promises to be even more exciting with two Canadian astronauts scheduled for spaceflights, one being Canada's first on a six-month long-duration ISS Expedition crew, together with increased funding allocated for the development of terrestrial prototypes for future Moon and Mars exploration missions.

2008 Highlights:

Significant Canadian initiatives supporting space exploration during 2008:

- In March, Dextre the last robotics component of Canada's contribution to the ISS was launched and successfully installed. An essential, versatile tool for servicing the Station, Dextre is a dexterous two-armed robot capable of carrying out maintenance tasks including removing and replacing small components on the Station.
- The CSA continued to support the ISS operations for the Canadian Mobile Servicing System
 (MSS) with the fully operational MSS Mission Control Center at CSA and Robotics Mission
 Controllers at NASA-JSC. In addition the CSA continued with its training of astronauts and
 mission controllers, and made excellent progress in furthering MSS ground control operations
 (from CSA).
- Canadian scientists increased their use of the ISS. Two subjects completed the life sciences experiment Cardiovascular and Cerebrovascular Control on return from ISS.
- The Canadian weather station on the NASA Phoenix Mars lander marked the first time that Canada, as a nation, landed on the surface of Mars. The weather station's lidar instrument detected snow in the Martian atmosphere by detecting snowflakes falling from clouds about 4 kilometres above the spacecraft's landing site.
- In July, the CSA was the host for the second ISECG meeting.
- At the ESA Ministerial in November, the CSA confirmed its continuing participation to the ExoMars mission.
- The CSA launched a national astronaut recruitment campaign and received 5351 responses from highly educated, highly skilled Canadians. A final selection of two members of Canada's Astronaut Corps will be made during the spring of 2009.
- In 2008 the Canadian Space Agency inaugurated its Exploration Core Program with the aim of advancing potential Canadian contributions to international space exploration activities, while reducing risk and ensuring Canada's readiness to participate as a credible partner.
 - o 18 concept studies evaluating various potential contributions to space exploration activities were completed and a final report is being prepared. These studies covered mobility on the Moon, on-orbit robotics, ISRU, science instruments for the Moon and Mars, manipulators and tools, vision systems, communications systems, and crew medical and life support systems.
 - Five contracts to build prototypes that will be tested in analogue sites were awarded.
 These contracts address mobility for ISRU, ISRU operational capabilities, navigation aids for human-sized rovers, rover guidance navigation and control and a terrestrial breadboard of a Mars science rover.

- o The Canadian Analogue Research Network was again very active supporting analogue missions for science, technology and astronauts.
- A request for proposals was launched for nine phase zero studies to define user requirements and the feasibility of Canadian participation in various international space missions: ILN, Selene-2, Mars Sample Return, Mars Science Orbiter, Lunar mobility system, Lunar ISRU system and a robotic servicing module for a future exploration vehicle.
- o The CSA participated in the NASA RESOLVE demonstration for ISRU in Hawaii.
- o A science exploration workshop was also held in November to refine the science objectives for the exploration of the Moon and Mars.

Upcoming events:

2009 will be even more exciting with the following planned activities:

- In May Dr. Bob Thirsk will become the first Canadian astronaut to take part in a long-duration stay aboard the ISS and will be part of the first six-astronaut crew on the Station.
- In mid-June, Canadian astronaut Julie Payette will fly aboard the Space Shuttle flight STS-127 to install the external scientific platform on the Kibo module.
- In July, the Canadian 3D vision system for rendezvous and docking TriDAR will fly on the STS-128 as a demonstration for docking the Space Shuttle with the ISS.
- Canadian scientists will continue to access and use the ISS for science with the following planned experiments: Bodies in the Space Environment (BISE, a neuroscience experiment); APEX-CAMBIUM, a plant biology experiment with implications for forestry; VASCULAR, a study of the effects of space on the structure and function of blood vessels; Binary Colloid Alloy Test, a NASA-CSA collaboration examining the physics of colloid behaviour; and, SODI-IVIDIL, an ESA-CSA collaboration focusing on the fundamental nature of thermodiffusion.
- The Exploration Core Program activities will increase significantly with the additional funding allocated to the CSA by the Canadian Government in early 2009. These funds will foster the development of terrestrial prototypes of Moon and Mars rovers and other space technologies required to support exploration initiatives. The primary activities will be focused on on-orbit robotic servicing and mobility systems required for the Moon and Mars, along with the required sub-systems supporting science and ISRU. Intermediate deployments are planned to test the system leading to a major integrated deployment in 2012.
- In April, the CSA is planning a Canadian Exploration Workshop to validate exploration scenarios, discuss future plans and create opportunities for linkage between space and terrestrial industries.
- Following a vast consultation with space industry, academia, other government departments and space agencies, and approval by the Government of Canada, the Long Term Space Plan-IV may be released in spring 2010. With a twenty-year vision, the Plan will fully outline the objectives, orientations and investments that will be made over the next decade by the Canadian Space Program to fully respond to and support the priorities of Canada and Canadians.

CSIRO/Australia Exploration Highlights

Background

Australia's national science agency the Commonwealth Scientific and Industrial Research Organisation (CSIRO; http://www.csiro.au) represents Australia in the International Space Exploration Coordination Group (ISECG). Australia has played a small but significant role in space science since the earliest days of the space age, when cooperative research with the US in radio communications and tracking led to Australia's management of Australian-based ground stations in support of NASA programs ranging from earth orbiting and human space flight to solar system exploration. CSIRO manages operations of the Canberra Deep Space Communication Complex (CDSCC) in Canberra and the new Australian Tracking Facility (ATF) in Western Australia.

Although few Australian research flight projects have flown in recent years, Australia has provided components to a range of international flight projects and is at the forefront of Exploration-relevant technologies such as systems robotics, communications, biomedicine.

Commonwealth Government query

In March 2008 the Australian Commonwealth Senate Standing Committee on Economics announced an enquiry around Australia's space science and industry. After hundreds of submissions and testimony the resulting publication makes several recommendations toward the coordination of Australia's space activities. The Australian Government (including CSIRO) is preparing a response. In parallel, reorganisation within CSIRO placed the CSIRO Office of Space Science and Application within the portfolio of Australia's representative to ISECG Dr. Miriam Baltuck. We are still working on a name for this group, but CSIRO Space has a nice ring! This entity is a co-investigator in a SMEX space science flight project proposal to NASA submitted in December 2008; if selected CSIRO will manage a government + academic team to provide ground support and data analysis.

Next Steps in 2009

Australia's path to contributing to ISECG goals lies in international cooperation. Our growing informal working group has met informally over 2008 and we have requested observer status in IMEWG to pursue possible areas of cooperation in a Mars Sample Return mission. Our ad hoc group has continued to expanding to include additional relevant activities and technologies as we continue to pursue avenues for our initial areas of focus. Thus 2009 will see us continuing to further existing dialogues and identify and pursue new possible partnerships.

DLR/Germany Exploration Highlights

ISS - DLR and German industry were intensively involved in the successful delivery and mating of Columbus as well as the successful launch, docking and de-orbiting of ATV. ALL Activities in the European laboratory are since February 2008 controlled by the Columbus Ground Control Centre, a DLR facility in Oberpfaffenhofen, Germany.

Lunar Exploration Orbiter - The German Space Agency DLR has continued the LEO mission preparation in 2008 with a phase-A study. The mission concept is based on a main satellite and two subsatellites. The satellites can carry about 100 kg of payload for 15 experiments. LEO will provide a unique and complete set of integrated high-resolution data with global lunar coverage for a broad variety of scientific evaluations. Due to the missing funding decision in 2008, the mission preparation is now discontinued for some time. Results of the phase-A achieved so far, are secured.

Lunar Soft-Landing Demonstrator – first steps for the system definition with soft landing capabilities have been taken; this topic is regarded as crucial for future exploration tasks and scenarios.

Fuel Cell – a study on the technical feasibility of a regenerative/reversible fuel cell is conducted. It sets up on an existing unique German technology. The research looks very promising. The idea is to use fuel cells as energy storage and converter for future exploration missions, especially in missions with timely limited availability of solar power.

DGLR - the German Society for Aviation & Space (DGLR) organized a 3-day meeting in Bremen, from 15th September 2008 onwards. 15 countries participated in the "Moon & Beyond" conference. The organizers judged the quality of presentations & discussions as very good.

ESA/Europe Exploration Highlights

2008 proved to be a successful year for ESA as an international partner in the International Space Station endeavour. The European Columbus laboratory has become an integral part of the ISS since February 2008 and with a perfectly controlled re-entry high above the Pacific Ocean on 29 September, ESA's Jules Verne, the first Automated Transfer Vehicles (ATVs), successfully completed its six-month inaugural mission.

The first steps in scientific utilisation of Columbus took place during the assembly and commissioning mission itself in February. The external payload EuTEF (European Technology Exposure Facility) carried out the first Columbus experiment. EuTEF houses a suite of experiments requiring long-term exposure to open space and covering a variety of disciplines including material science, plasma physics, astrobiology, astronomy and space technology. All 13 experiments have successfully produced research results.

The astronaut selection campaign for new ESA astronauts, started in spring 2008, is entering its final phase.

Frank De Winne, of Belgian nationality and a member of the European Astronaut Corps, was selected to fly to the International Space Station in May 2009 for the start of a six-month mission. The OasISS mission sees him become the first European commander of the Station by October 2009.

On 25 and 26 November the ESA Council meeting at Ministerial level decided on major ESA programmes for the next three years. With regard to human spaceflight, ESA member states endorsed the following programme proposals:

- The International Sp ace Station (ISS) Exploitation Program me Period 3 (timeframe 2008-2012), aimed at operating, maintaining and exploiting the European elements of the ISS and providing Europe's contribution to common operations by delivering cargo and services.
- The European Transportation and Hum an Ex ploration Pr eparatory Activities Pro gramme (timeframe 2008-2011), which includes the initial definition phases of an ATV-based cargo download system Advanced Re-entry Vehicle (ARV) and studies on the definition of a Lunar Lander.
- The **ELIPS-Period 3 P rogramme** (timeframe 2008-2012), the continuation of the European Programme for Life and Physical Sciences.

The European Transportation and Human Exploration Preparatory Activities programme received good support securing future work on the Phase A of the Advanced Re-entry Vehicle, Lunar Lander activities and scenario studies analysing the European role in future human spaceflight and exploration as well as work on enabling technologies for transportation & exploration.

With regard to exploration, ESA member states endorsed the following programme proposals:

- The **ExoMars mission**, to be flown in 2016, with a simplification of the mission's architecture in parallel to a consolidation of the technical aspects to institute savings. This could include reduction of certain activities and a possible re-definition of the mission's goals, broadly in line with the initial mission concept, and searching for further contributions by international partners in the framework of a long-term cooperation.
- A Mars Robotic Exploration Preparation programme with the aim to prepare long-term technology goals leading to a Mars Sample Return mission, and system studies for intermediate missions' definition.

In cooperation with CNES, NASA and IMEWG, ESA organised an international event (8 July) where the iMARS work on an international architecture for a MSR mission concept was presented and debated in the context of future space exploration efforts.

Since February 2008, representatives from NASA and ESA have been engaged in detailed assessment of potential programs and technologies that when conducted cooperatively could one day support a human outpost on the Moon. The NASA-ESA comparative exploration architecture study was intended to assess the degree to which NASA and ESA's lunar exploration architecture concepts could complement, augment, or enhance the exploration plans of one another. Technical teams from each agency engaged in a series of joint, qualitative assessments of the potential scientific and exploration benefits that arise from collaboration between the ESA capabilities under study and NASA's Ares I and V space transportation systems and lunar surface exploration architecture concepts. A similar architecture study is also being initiated with JAXA.

The Heads of the International Space Station (ISS) Agencies from Canada, Europe, Japan, Russia and the United States met in July 2008 at ESA Headquarters in Paris, France, to review ISS cooperation. As part of their discussions, they noted the significantly expanded capability the ISS now provides for on-orbit research and technology development activities and as an engineering test-bed for flight systems and operations critical to future space exploration initiatives. They reviewed current ISS development, configuration and operations activities across the partnership.

As the partnership moves closer to completion of ISS assembly, the Heads of Agency reaffirmed their common interest in utilising the space station to its full capacity for a period meaningful for stakeholders and users.

The key focus of ESA's activities in the near future remains ISS utilisation and the European participation in the International Space Station operations via the ESA ISS Exploitation programme, including the production of further ATVs to fulfil Europe's obligations. It is also focused on the preparation of the ExoMars mission, the ISS lifetime extension and the lunar lander development activities.

JAXA-JSPEC/Japan Exploration Highlights

In 2008, there were many achievements in space exploration activities in relation to JAXA/JSPEC.

• The Establishment of International Primitivebody Working Group (IPEWG) and its first meeting In order to promote international collaborations and to maximize outcomes of missions on primitive body exploration, the first International Primitive Body Exploration Working Group (IPEWG) meeting was held in 14-16 January 2008 in Okinawa, Japan hosted by JAXA. More than 50 participants from space agencies, scientists, engineers and other interested stakeholders were participated in the meeting and many fruitful discussions and presentations (oral & poster) were made. It was agreed that JAXA will play a role of Secretariat and the IPEWG meeting will be held every two years. Next meeting will be in 2010 by the NASA's voluntary host.

• "Kibo" has attached to the ISS

The Japanese Experiment Module (JEM), known as "Kibo" which means hope in Japanese, is Japan's first human-rated space facility and JAXA's first contribution to the International Space Station (ISS) program. Kibo was mainly designed and developed with a view to conducting scientific research activities on orbit. In Kibo, a maximum of four astronauts can perform experimental activities.

In mid-March 2008, JAXA's <u>Astronaut, Takao Doi</u> flew to the ISS with Kibo's stowage module, Experiment Logistic Module-Pressurized Section (ELM-PS). Another JAXA's <u>Astronaut, Akihiko Hoshide</u> joined the mission to the ISS with Kibo's main experiment module, Pressurized Module (PM), and Kibo's robotic arm, JEMRMS in June 2008. The rests of Kibo's components, the Exposed Facility and the ELM's Exposed Section (ELM-ES) are scheduled to be launched and to attach the ISS around mid of 2009. Inside of the Kibo's PM, JAXA currently performs various experiments utilizing microgravity environment.

 Scientific data from Kaguya has been brought us a various knowledge as well as impressed images

JAXA's Lunar orbiting explorer "Kaguya" has taken a lot of scientific data by 14 instruments onboard and its results are appeared in scientific journal and in public. After successful operation phase of Kaguya for about 1 year, post-operation phase has started from November 2008.



Selene-2 and Hayabusa-2/Marco Polo

SELENE-2, aiming to acquire the lunar soft landing and rover technology and in-situ scientific data is under phase-A study. JAXA/JSPEC hopes its launch around mid of 2010s.

Hayabusa-2 and Marco Polo are robotic sample return missions, succeeding Hayabusa project, toward elucidation of the origin and evolution of our solar system and life.

Hayabusa-2 is in the phase-A study and Marco Polo, the Japan and Europe joint mission, won the first selection of ESA's Cosmic Vision Program.

• Space Basic Law and establishment of Strategic Headquarters for Space Development In August 28, 2008, Space Basic Law was enforced and to promote space policy in Japan comprehensively, the Strategic Headquarters for Space Development was established in the Cabinet headed by the Prime Minister of Japan.

NASA/United States of America Exploration Highlights

Introduction: 2008 marked another series of accomplishments in NASA's human and robotic exploration programs – we landed on Mars, added to the International Space Station, took part in a lunar science mission with India and made major progress toward returning astronauts to the Moon as the agency celebrated its 50th birthday in 2008.

Some of the highlights of NASA's golden anniversary year are listed below, along with links for further information.

Human Spaceflight: NASA completed four Shuttle missions to the International Space Station (ISS) in 2008, delivering modules and hardware allowing ISS to house six crew members for long-duration missions in support of scientific exploration. The activation in 2008 of the European Space Agency's Columbus module and Jules Verne Automated Transfer Vehicle, as well as the Japan Aerospace Exploration Agency's Kibo laboratory, marked the beginning of new human spaceflight control centers in Germany, France and Japan that are working with existing control centers in the U.S., Russia and Canada.

http://www.nasa.gov/mission_pages/station/main/10th_main.html

Robotic Exploration: NASA's Phoenix Mars Lander safely reached a soft landing on Mars on May 25 – a site farther north than where any previous spacecraft had landed. The mission, which included contributions by the Canadian Space Agency and other partners, successfully returned unprecedented science data to Earth, advancing the goal of documenting the history of water on Mars. Analysis of data from its instruments continues. http://www.nasa.gov/phoenix. NASA has also partnered with India to fly two science instruments aboard the country's first lunar explorer, Chandrayaan-1. The Indian Space Research Organization launched Chandrayaan-1 on October 22 from Sriharikota, India, entering lunar orbit on Nov. 8. NASA's Moon Mineralogy Mapper is surveying mineral resources of the Moon, and the Miniature Synthetic Aperture Radar is mapping the Moon's polar regions and looking for ice deposits in the permanently shadowed craters. Data from the two instruments is contributing to NASA's increased understanding of the lunar environment as we prepare for future robotic and human missions to the Mmoon, http://moonmineralogymapper.jpl.nasa.gov/

Human Exploration: NASA successfully completed the preliminary design review for the new Ares I rocket in 2008. Starting in 2015, Ares I will launch the Orion crew exploration vehicle and its crew of four to six astronauts to the ISS. The rocket also will be used as part of missions to explore the Moon and beyond in coming decades. NASA is preparing Ares I for its first test flight in 2009. http://www.nasa.gov/ares NASA engineers also successfully completed in 2008 the first series of tests in the early development of the J-2X engine that will power the upper stages of the Ares I and Ares V rockets. Ares V will carry cargo and components into orbit for trips to the Moon and later to Mars.

http://www.nasa.gov/home/hqnews/2008/may/HQ 08116 power pack tests.html. Finally, NASA completed the important Lunar Capability Concept Review milestone in 2008, confirming that conceptual designs for both Ares V and the Altair lunar lander were capable of landing astronauts and cargo anywhere on the Moon and to building an outpost supporting widespread exploration of the lunar surface.

NSAU/Ukraine Exploration Highlights

The year 2008 has been characterized by several events related to Exploration.

Agreements

Framework agreements of cooperation were signed with NASA, ESA, CNES and DLR. NSAU considers signing of these agreements as the path to contributing to ISECG goals in international cooperation. We anticipate activation of negotiation processes in the areas of joint interests with these agencies.

The realization of Ukrainian-European Twinning Project "Boosting Ukrainian Space Cooperation with the European Union" started in March 2008. CNES and DLR were defined as a partner for NSAU in the Twinning Project by the European Evaluation Commission. The purpose of project is to support Ukraine for its involvement to the European Research Area and European Space programs.

New National Space Program for 2008-2012 years

National Space Program for 2008-2012 years was approved by Ukrainian Parliament as a low in September 2008. As the part of the Program NSAU will continue the following activities related to Exploration:

- Participation of Ukrainian organizations in developing of scientific instruments for Russian space projects, such as "Spectr-R" (flux-gate magnetometer LEMI-604); "Fobos-Ground" (wave probes LEMI-605); "Coronas-Photon" (sensor of energetic particles STEP) was launched on January 30, 2009.
- Development of experiments ("Obstanovka", "Morphos", "Material-Friction", "Penta-Fatigue", "Trubka", "Spectrometer-Polarimeter", "Biosorbent", "Biopolymer", "Biolaboratory-M") in material sciences, life sciences, environment, and astrophysics in accordance with the "Joint Program of Space Experiments on board the Russian Segments of International Space Station".

Response to the Global Exploration Strategy

Following publication of "The Global Exploration Strategy: The Framework of cooperation" in Ukrainian for wide community, NSAU has initiated discussion with Ukrainian academic and industrial scientists and engineers in 2007. The "Call of ideas" to elaborate a national Exploration strategy was launched. NSAU will integrate the output of this "Call of ideas" and results of round-table discussion in September 2009 to the draft of "Exploration –Ukraine" program.

Next steps in 2009

NSAU will complete the "Space Strategy of Ukraine till 2030" and represent it to the Government by the 1st of June 2009.

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Committee on the Peaceful Uses of Outer Space

National legislation and practice relating to the definition and delimitation of outer space

Note by the Secretariat*

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^{*} The present document was prepared on the basis of replies from member States received after 5 January 2009.

II. Replies received from member States

Belarus

[Original: Russian]

- 1. According to Belarusian law, the airspace above a State's territory is part of that territory and all States have sovereignty over their own airspace. Furthermore, all States have the exclusive right to establish, independently and without outside interference of any kind, the rules governing flights in the airspace above their territory. Thus, under its Air Code of 2006, the airspace above Belarus is part of the territory of Belarus and the State has full and exclusive sovereignty over its airspace.
- 2. Law No. 156-3 of 5 May 1998, on objects belonging exclusively to the State, declares that the airspace above the territory of Belarus is the exclusive property of the State.
- 3. As regards the issue of the definition and delimitation of outer space, however, Belarus, which embarked on outer space activities only recently, does not yet have separate domestic legislation relating to outer space but is currently developing legislation that will, inter alia, cover that issue. Current law divides the airspace of Belarus into two categories: classified and unclassified. Airspace below an altitude of 20,100 m is classified and flights within it are governed by domestic legislation: the Air Code and the Rules for the Use of Airspace adopted by Order No. 1471 of the Council of Ministers on 4 November 2006. Outside classified airspace (above an altitude of 20,100 m), which is considered outer space, the provisions of international agreements apply.
- 4. The 1994 Constitution of Belarus states that Belarus recognizes the supremacy of the generally accepted principles of international law and shall ensure that its domestic legislation is in conformity with them. Law No. 421-3 of 23 July 2008, on international agreements, which entered into force on 5 December 2008, provides that Belarus shall faithfully implement the international agreements it enters into, in accordance with international law.
- 5. The legal norms contained in the international agreements entered into by Belarus are part of the legislation in force within the territory of Belarus and are applied automatically, except in cases in which it is specified in an international agreement that domestic legislation must be adopted and promulgated for such norms to be applied.
- 6. Belarus is party to the basic international space agreements, including the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, which it applies automatically. Thus, in accordance with article II of the Outer Space Treaty, Belarus does not claim sovereignty over outer space. In fact, it believes that outer space is the common property of all humankind and is not subject to the sovereignty of any State, which means that the legal regime for outer space is that set out in international agreements on outer space. Belarus also believes that States bear

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¹ United Nations, Treaty Series, vol. 610, No. 8843.

responsibility for their activities in outer space, which is why it has ratified the Convention on International Liability for Damage Caused by Space Objects² and the Convention on Registration of Objects Launched into Outer Space.³

Czech Republic

[Original: English]

- 1. To date, the Czech Republic has not adopted national laws on the issue. As to the space activities of the Czech Republic, all have been carried out in full conformity with the United Nations treaties and principles on outer space and the recommendations included in General Assembly resolutions relating to outer space.
- 2. As to the particular question of practices that might exist or be in development relating directly or indirectly to the definition and delimitation of outer space and airspace, the Czech Republic, taking into account the current and foreseeable level of development of space and aviation technologies, is aware of the difference between the legal regime governing the activities in airspace on the one hand and the legal regime governing space activities on the other hand. Whereas air activities can be carried out only with due regard to the generally recognized principle that States have complete and exclusive sovereignty over the airspace above their territory, outer space, including the Moon and other celestial bodies, has been free for exploration and use by all States in accordance with international law. While a boundary between applicability of those two different legal regimes has not been agreed upon yet, the Czech Republic has respected the customary principle of considering as a space activity the launching of space objects, whose purpose it is to orbit the Earth or otherwise move in outer space.

Mexico

[Original: Spanish]

Article 42 of the Political Constitution of Mexico provides that the national territory of Mexico comprises, inter alia, the space located above the national territory to the extent and in accordance with the rules established by international law.

Mongolia

[Original: English]

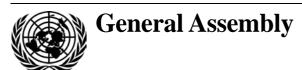
Definitions and delimitations relating to outer space and the character and utilization of the geostationary orbit are set out in national legislation by Parliament, the Government, ministries, agencies and the Mongolian Academy of Sciences.

² Ibid., vol. 961, No. 13810.

³ Ibid., vol. 1023, No. 15020.

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Committee on the Peaceful Uses of Outer Space

Safety Framework for Nuclear Power Source Applications in Outer Space

Preface

Nuclear power sources (NPS) for use in outer space have been developed and used in space applications where unique mission requirements and constraints on electrical power and thermal management precluded the use of non-nuclear power sources. Such missions have included interplanetary missions to the outer limits of the Solar System, for which solar panels were not suitable as a source of electrical power because of the long duration of these missions at great distances from the Sun.

According to current knowledge and capabilities, space NPS are the only viable energy option to power some space missions and significantly enhance others. Several ongoing and foreseeable missions would not be possible without the use of space NPS. Past, present and foreseeable space NPS applications include radioisotope power systems (for example, radioisotope thermoelectric generators and radioisotope heater units) and nuclear reactor systems for power and propulsion. The presence of radioactive materials or nuclear fuels in space NPS and their consequent potential for harm to people and the environment in Earth's biosphere due to an accident require that safety should always be an inherent part of the design and application of space NPS.

NPS applications in outer space have unique safety considerations compared with terrestrial applications. Unlike many terrestrial nuclear applications, space applications tend to be used infrequently and their requirements can vary significantly depending upon the specific mission. Mission launch and outer space operational requirements impose size, mass and other space environment limitations not present for many terrestrial nuclear facilities. For some applications, space NPS must operate autonomously at great distances from Earth in harsh environments. Potential accident conditions resulting from launch failures and inadvertent re-entry could expose NPS to extreme physical conditions. These and other unique safety considerations for the use of space NPS are significantly different from those for

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terrestrial nuclear systems and are not addressed in safety guidance for terrestrial nuclear applications.

After a period of initial discussion and preparation, the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space of the United Nations and the International Atomic Energy Agency (IAEA) agreed in 2007 to jointly draft a safety framework for NPS applications in outer space. This partnership integrated the expertise of the Scientific and Technical Subcommittee in the use of space NPS with the well-established procedures of IAEA for developing safety standards pertaining to nuclear safety of terrestrial applications. The Safety Framework for Nuclear Power Source Applications in Outer Space represents a technical consensus of both bodies.

The Safety Framework is intended to be utilized as a guide for national purposes. As such, it provides voluntary guidance and is not legally binding under international law.

The Safety Framework is not a publication in the IAEA Safety Standards Series, but it is intended to complement the Safety Standards Series by providing high-level guidance that addresses unique nuclear safety considerations for relevant launch, operation and end-of-service mission phases of space NPS applications. It complements existing national and international safety guidance and standards pertaining to terrestrial activities that involve the design, manufacture, testing and transportation of space NPS. The Safety Framework has been developed with due consideration of relevant principles and treaties. The Safety Framework does not supplement, alter or interpret any of those principles or treaties.

The focus of the Safety Framework is the protection of people and the environment in Earth's biosphere from potential hazards associated with relevant launch, operation and end-of-service mission phases of space NPS applications. The protection of humans in space is an area of ongoing research and is beyond the scope of the Safety Framework. Similarly, the protection of environments of other celestial bodies remains beyond the scope of the Safety Framework.

Safety terms used in the Safety Framework are defined in the IAEA Safety Glossary. As used herein, the term "nuclear safety" includes radiation safety and radiation protection. Additional terms specific to space NPS applications are defined in the section of the Safety Framework entitled "Glossary of terms".

In summary, the purpose of the Safety Framework is to promote the safety of NPS applications in outer space; as such, it applies to all space NPS applications without prejudice.

The Scientific and Technical Subcommittee and IAEA wish to express their appreciation to all those who assisted in the drafting and review of the text of the Safety Framework and in the process of reaching consensus.

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1. Introduction

1.1. Background

Nuclear power sources (NPS) for use in outer space¹ have been developed and used on spacecraft where unique mission requirements and constraints on electrical power and thermal management precluded the use of non-nuclear power sources. Such missions have included interplanetary missions to the outer limits of the Solar System, for which solar panels were not suitable as a source of electrical power because of the long duration of the mission at great distances from the Sun.

Past, present and foreseeable space NPS applications include radioisotope power systems (including radioisotope thermoelectric generators and radioisotope heater units) and nuclear reactor systems for power and propulsion. Space NPS have enabled several ongoing missions. According to current knowledge and capabilities, space NPS are the only viable energy option to power some foreseeable space missions and significantly enhance others.

Both normal operating and potential accident conditions for space NPS applications, through the launch, operation and end-of-service phases, are radically different from the conditions for terrestrial applications. The launch and outer space environments create very different safety design and operational criteria for space NPS. Furthermore, space mission requirements lead to unique mission-specific designs for space NPS, spacecraft, launch systems and mission operations.

The presence of radioactive materials or nuclear fuels in space NPS and their consequent potential for harm to people and the environment in Earth's biosphere due to an accident require that safety must always be an inherent part of the design and application of space NPS. Safety (i.e. protection of people and the environment²) should focus on the entire application and not only on the space NPS component. All elements of the application could affect the nuclear aspects of safety. Therefore, safety needs to be addressed in the context of the entire space NPS application, which includes the space NPS, spacecraft, launch system, mission design and flight rules.

1.2. Purpose

The purpose of this publication is to provide high-level guidance in the form of a model safety framework. The framework provides a foundation for the development of national and international intergovernmental safety frameworks while allowing for flexibility in adapting such frameworks to specific space NPS applications and organizational structures. Such national and international intergovernmental frameworks should include both technical and programmatic elements to mitigate risks arising from the use of space NPS. Implementation of such frameworks not only would provide assurance to the global public that space NPS applications would be launched and used in a safe manner, but could also facilitate bilateral and multilateral cooperation on space missions using NPS. The guidance provided

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¹ As used herein, the term "outer space" is synonymous with "space".

² As used herein, the term "people and the environment" is synonymous with the term "people and the environment in Earth's biosphere".

herein reflects an international consensus on measures needed to achieve safety and applies to all space NPS applications without prejudice.

1.3. Scope

The Safety Framework for Nuclear Power Source Applications in Outer Space focuses on safety for relevant launch, operation and end-of-service phases of space NPS applications. High-level guidance is provided for both the programmatic and technical aspects of safety, including the design and application of space NPS. However, detailed usage of this guidance depends on the particular design and application. Implementation of the guidance provided in the Safety Framework would supplement existing standards that cover other aspects of space NPS applications. For example, activities occurring during the terrestrial phase of space NPS applications, such as development, testing, manufacturing, handling and transportation, are addressed in national and international standards relating to terrestrial nuclear installations and activities. Similarly, non-nuclear safety aspects of space NPS applications are addressed in relevant safety standards of governments and international intergovernmental organizations (e.g. regional space agencies).

A substantial body of knowledge exists for establishing a space NPS application safety framework for people and the environment in Earth's biosphere. However, comparable scientific data do not yet exist that would provide a technically sound basis for developing a space NPS application framework for protecting humans in the unique conditions in space and beyond Earth's biosphere. Therefore, the protection in space of humans involved in missions that use space NPS applications is beyond the scope of the Safety Framework. Similarly, the protection of environments of other celestial bodies remains beyond the scope of the Safety Framework.

2. Safety objective

The fundamental safety objective is to protect people and the environment in Earth's biosphere from potential hazards associated with relevant launch, operation and end-of-service phases of space nuclear power source applications.

Governments, international intergovernmental organizations and non-governmental entities that are involved in space NPS applications should take measures to ensure that people (individually and collectively) and the environment are protected without unduly limiting the uses of space NPS applications.

Guidance for satisfying the fundamental safety objective is grouped into three categories: guidance for governments (section 3 below) applies to governments and relevant international intergovernmental organizations that authorize, approve or conduct space NPS missions; guidance for management (section 4 below) applies to the management of the organization that conducts space NPS missions; and technical guidance (section 5 below) applies to the design, development and mission phases of space NPS applications.

3. Guidance for governments

This section provides guidance for governments and relevant international intergovernmental organizations (e.g. regional space agencies) that authorize, approve or conduct space NPS missions. Governmental responsibilities include establishing safety policies, requirements and processes; ensuring compliance with those policies, requirements and processes; ensuring that there is acceptable justification for using a space NPS when weighed against other alternatives; establishing a formal mission launch authorization process; and preparing for and responding to emergencies. For multinational or multiorganizational missions, governing instruments should define clearly the allocation of these responsibilities.

3.1. Safety policies, requirements and processes

Governments that authorize or approve space nuclear power source missions should establish safety policies, requirements and processes.

Governments and relevant international intergovernmental organizations that authorize or approve space NPS missions, whether such missions are conducted by governmental agencies or by non-governmental entities, should establish and ensure compliance with their respective safety policies, requirements and processes to satisfy the fundamental safety objective and fulfil their safety requirements.

3.2. Justification for space nuclear power source applications

The government's mission approval process should verify that the rationale for using the space nuclear power source application has been appropriately justified.

Space NPS applications may introduce risk to people and the environment. For this reason, governments and relevant international intergovernmental organizations that authorize, approve or conduct space NPS missions should ensure that the rationale for each space NPS application considers alternatives and is appropriately justified. The process should consider benefits and risks to people and the environment related to relevant launch, operation and end-of-service phases of the space NPS application.

3.3. Mission launch authorization

A mission launch authorization process for space nuclear power source applications should be established and sustained.

The government that oversees and authorizes the launch operations for space NPS missions should establish a mission launch authorization process focused on nuclear safety aspects. The process should include an evaluation of all relevant information and considerations from other participating organizations. The mission launch authorization process should supplement the authorization processes covering non-nuclear and terrestrial aspects of launch safety. An independent safety evaluation (i.e. a review, independent of the management organization conducting the mission, of the adequacy and validity of the safety case) should be an integral part of the authorization process. The independent safety evaluation should consider the entire space NPS application – including the space NPS, spacecraft, launch system, mission design and flight rules – in assessing the risk to people and the

environment from relevant launch, operation and end-of-service phases of the space mission.

3.4. Emergency preparedness and response

Preparations should be made to respond to potential emergencies involving a space nuclear power source.

Governments and relevant international intergovernmental organizations that authorize, approve or conduct space NPS missions should be prepared to respond rapidly to launch and mission emergencies that may result in radiation exposure of people and radioactive contamination of Earth's environment. Emergency preparedness activities include emergency planning, training, rehearsals and development of procedures and communication protocols, including the drafting of potential accident notifications. Emergency response plans should be designed so as to restrict radioactive contamination and radiation exposure.

4. Guidance for management

This section provides guidance for management of the organizations involved in space NPS applications. In the context of the Safety Framework, management should comply with governmental and relevant intergovernmental safety policies, requirements and processes to satisfy the fundamental safety objective. Management responsibilities include accepting prime responsibility for safety, ensuring the availability of adequate resources for safety and promoting and sustaining a robust safety culture at all organizational levels.

4.1. Responsibility for safety

The prime responsibility for safety should rest with the organization that conducts the space nuclear power source mission.

The organization that conducts the space NPS mission has the prime responsibility for safety. That organization should include, or have formal arrangements with, all relevant participants in the mission (spacecraft provider, launch vehicle provider, NPS provider, launch site provider etc.) for satisfying the safety requirements established for the space NPS application.

Specific safety responsibilities for management should include the following:

- (a) Establishing and maintaining the necessary technical competencies;
- (b) Providing adequate training and information to all relevant participants;
- (c) Establishing procedures to promote safety under all reasonably foreseeable conditions;
- (d) Developing specific safety requirements, as appropriate, for missions that use space NPS;
- (e) Performing and documenting safety tests and analyses as input to the governmental mission launch authorization process;
 - (f) Considering credible opposing views on safety matters;

(g) Providing relevant, accurate and timely information to the public.

4.2. Leadership and management for safety

Effective leadership and management for safety should be established and sustained in the organization that conducts the space nuclear power source mission.

Leadership in safety matters should be demonstrated at the highest levels in the organization that conducts the mission. Management of safety should be integrated with the overall management of the mission. Management should develop, implement and maintain a safety culture that ensures safety and satisfies the requirements of the governmental mission launch authorization process.

The safety culture should include the following:

- (a) Clear lines of authority, responsibility and communication;
- (b) Active feedback and continuous improvement;
- (c) Individual and collective commitment to safety at all organizational levels;
 - (d) Safety accountability of the organization and of individuals at all levels;
- (e) A questioning and learning attitude to discourage complacency with regard to safety.

5. Technical guidance

This section provides technical guidance for organizations involved in space NPS applications. This guidance is pertinent to the design, development and mission phases of space NPS applications. It encompasses the following key areas for developing and providing the technical basis for the authorization and approval processes and for emergency preparedness and response:

- (a) Establishing and maintaining a nuclear safety design, test and analysis capability;
- (b) Applying that capability in the design, qualification and mission launch authorization processes of the space NPS application (i.e. space NPS, spacecraft, launch system, mission design and flight rules);
- (c) Assessing the radiation risks to people and the environment arising from potential accidents and ensuring that the risk is acceptable and as low as reasonably achievable;
 - (d) Taking action to manage the consequences of potential accidents.

5.1. Technical competence in nuclear safety

Technical competence in nuclear safety should be established and maintained for space nuclear power source applications.

Having technical competence in nuclear safety is vital for satisfying the safety objective. From the earliest point in the development of a space NPS application,

organizations should establish, consistent with their responsibilities, nuclear safety design, test and analysis capabilities, including qualified individuals and facilities, as appropriate. Those capabilities should be maintained for the duration of the relevant phases of the space NPS missions.

Competence in nuclear safety should include:

- (a) Defining space NPS application accident scenarios and their estimated probabilities in a rigorous manner;
- (b) Characterizing the physical conditions to which the space NPS and its components could be exposed in normal operations, as well as potential accidents;
- (c) Assessing the potential consequences to people and the environment from potential accidents;
- (d) Identifying and assessing inherent and engineered safety features to reduce the risk of potential accidents to people and the environment.

5.2. Safety in design and development

Design and development processes should provide the highest level of safety that can reasonably be achieved.

The underlying approach to satisfying the safety objective should be to reduce the risks from normal operations and potential accidents to as low a level as is reasonably achievable by establishing comprehensive design and development processes that integrate safety considerations in the context of the entire space NPS application (i.e. space NPS, spacecraft, launch system, mission design and flight rules). Nuclear safety should be considered from the earliest stages of design and development and throughout all mission phases. The design and development processes should include:

- (a) Identifying, evaluating and implementing design features, controls and preventive measures that:
 - (i) Reduce the probability of potential accidents that could release radioactive material;
 - (ii) Reduce the magnitude of potential releases and their potential consequences;
 - (b) Incorporating lessons learned from prior experience;
- (c) Verifying and validating design safety features and controls through tests and analyses, as appropriate;
- (d) Using risk analysis to assess the effectiveness of design features and controls and to provide feedback to the design process;
 - (e) Using design reviews to provide assurance of the safety of the design.

5.3. Risk assessments

Risk assessments should be conducted to characterize the radiation risks to people and the environment.

The radiation risks to people and the environment from potential accidents during relevant launch, operation and end-of-service phases of space NPS applications should be assessed and uncertainties quantified to the extent possible. Risk assessments are essential for the mission launch authorization process.

5.4. Accident consequence mitigation

All practical efforts should be made to mitigate the consequences of potential accidents.

As part of the safety process for space NPS applications, measures should be evaluated to mitigate the consequences of accidents with the potential to release radioactive material into Earth's environment. The necessary capabilities should be established and made available, as appropriate, for timely support of activities to mitigate the consequences of accidents, including:

- (a) Developing and implementing contingency plans to interrupt accident sequences that could lead to radiation hazards;
 - (b) Determining whether a release of radioactive material has occurred;
- (c) Characterizing the location and nature of the release of radioactive material;
 - (d) Characterizing the areas contaminated by radioactive materials;
- (e) Recommending protective measures to limit exposure of population groups in the affected areas;
- (f) Preparing relevant information regarding the accident for dissemination to the appropriate governments, international organizations and non-governmental entities and to the general public.

6. Glossary of terms

The glossary below defines terms that are specific to space NPS applications. General safety terms used in the Safety Framework are defined in the IAEA Safety Glossary, 2007 Edition.³

End-of-service phase: the period of time after the useful life of a spacecraft

Flight rules: a collection of pre-planned decisions to minimize the amount of realtime decision-making required for nominal and off-nominal situations affecting a mission

Launch: a set of actions at the launch site leading to the delivery of a spacecraft to a predetermined orbit or flight trajectory

³ International Atomic Energy Agency, IAEA Safety Glossary: Terminology Used in Nuclear Safety and Radiation Protection, 2007 Edition (Vienna, 2007).

Launch phase: the period of time that includes the following: pre-launch preparation at the launch site, lift-off, ascent, operation of upper (or boost) stages, payload deployment and any other action associated with delivery of a spacecraft to a predetermined orbit or flight trajectory

Launch vehicle: any propulsive vehicle including upper (or boost) stages constructed for placing a payload into space

Launch system: the launch vehicle, launch site infrastructure, supporting facilities, equipment and procedures required for launching a payload into space

Mission: launch and operation (including end-of-service aspects) of a payload (e.g. spacecraft) beyond Earth's biosphere for a specific purpose

Mission approval: permission by a governmental authority for activities to proceed for preparing a mission for launch and operation

Mission design: the design of a space mission's trajectory and manoeuvres based on mission objectives, launch vehicle and spacecraft capabilities and mission constraints

Mission launch authorization: permission by a governmental authority to launch and operate a mission

Space nuclear power source: a device that uses radioisotopes or a nuclear reactor for electrical power generation, heating or propulsion in a space application

Space nuclear power source application: the overall system (space nuclear power source, spacecraft, launch system, mission design, flight rules etc.) involved in conducting a space mission involving a space nuclear power source

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Report of the Legal Subcommittee on its forty-eighth session, held in Vienna from 23 March to 3 April 2009

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I. Introduction

- 1. The Legal Subcommittee of the Committee on the Peaceful Uses of Outer Space held its forty-eighth session at the United Nations Office at Vienna from 23 March to 3 April 2009 under the chairmanship of Vladimír Kopal (Czech Republic).
- 2. The Subcommittee held a total of 20 meetings. The views expressed at those meetings are contained in unedited verbatim transcripts (COPUOS/Legal/T.783-802).

A. Adoption of the agenda

- 3. At its 783rd meeting, on 23 March, the Legal Subcommittee adopted the following agenda:
 - 1. Opening of the session and adoption of the agenda.
 - 2. Statement by the Chairman.
 - 3. General exchange of views.
 - 4. Status and application of the five United Nations treaties on outer space.
 - 5. Information on the activities of international intergovernmental and non-governmental organizations relating to space law.
 - 6. Matters relating to:
 - (a) The definition and delimitation of outer space;
 - (b) The character and utilization of the geostationary orbit, including consideration of ways and means to ensure the rational and equitable use of the geostationary orbit without prejudice to the role of the International Telecommunication Union.
 - 7. Review and possible revision of the Principles Relevant to the Use of Nuclear Power Sources in Outer Space.
 - 8. Examination and review of the developments concerning the draft protocol on matters specific to space assets to the Convention on International Interests in Mobile Equipment.
 - 9. Capacity-building in space law.
 - 10. General exchange of information on national mechanisms relating to space debris mitigation measures.
 - 11. General exchange of information on national legislation relevant to the peaceful exploration and use of outer space.
 - 12. Proposals to the Committee on the Peaceful Uses of Outer Space for new items to be considered by the Legal Subcommittee at its forty-ninth session.

B. Attendance

- 4. Representatives of the following States members of the Legal Subcommittee attended the session: Algeria, Argentina, Australia, Austria, Belgium, Bolivia (Plurinational State of), Brazil, Bulgaria, Burkina Faso, Canada, Chile, China, Colombia, Cuba, Czech Republic, Ecuador, Egypt, France, Germany, Greece, Hungary, India, Indonesia, Iran (Islamic Republic of), Italy, Japan, Kenya, Libyan Arab Jamahiriya, Malaysia, Mexico, Morocco, Netherlands, Nigeria, Peru, Philippines, Poland, Republic of Korea, Romania, Russian Federation, Saudi Arabia, Slovakia, South Africa, Spain, Switzerland, Thailand, Turkey, Ukraine, United Kingdom of Great Britain and Northern Ireland, United States of America and Venezuela (Bolivarian Republic of).
- 5. At the 783rd meeting, on 23 March, the Chairman informed the Subcommittee that requests had been received from the Dominican Republic, Israel, Panama and the United Arab Emirates to attend the session as observers. The Subcommittee agreed that, since the granting of observer status was the prerogative of the Committee on the Peaceful Uses of Outer Space, it could take no formal decision on the matter, but representatives of those States might attend the formal meetings of the Subcommittee and could direct requests for the floor to the Chairman, should they wish to make statements.
- 6. An observer for the International Atomic Energy Agency attended the session. The following organizations were also represented at the session by observers: European Space Agency, European Space Policy Institute, European Telecommunications Satellite Organization, International Academy of Astronautics, International Institute of Space Law, International Mobile Satellite Organization, International Organization of Space Communications, International Law Association, International Institute for the Unification of Private Law and Space Generation Advisory Council.
- 7. The Subcommittee took note of the request by the Asia-Pacific Space Cooperation Organization to be granted permanent observer status with the Committee (A/AC.105/C.2/2009/CRP.10).
- 8. A list of the representatives of States members of the Subcommittee, observers for States not members of the Subcommittee, intergovernmental organizations and other entities attending the session and members of the secretariat of the Subcommittee is contained in document A/AC.105/C.2/2009/INF/41 and Corr.1.

C. Organization of work

- 9. At the 783rd meeting, on 23 March, the Chairman made a statement briefly describing the work to be undertaken by the Subcommittee at its forty-eighth session. The Chairman's statement is contained in an unedited verbatim transcript (COPUOS/Legal/T.783).
- 10. In accordance with decisions taken at its 783rd meeting, the Subcommittee organized its work as follows:

- (a) The Subcommittee reconvened its Working Group on the Status and Application of the Five United Nations Treaties on Outer Space, open to all members of the Subcommittee, with Vassilis Cassapoglou (Greece) as Chairman;
- (b) The Subcommittee reconvened its Working Group on Matters Relating to the Definition and Delimitation of Outer Space, open to all members of the Subcommittee, with José Monserrat Filho (Brazil) as Chairman;
- (c) In accordance with paragraph 8 of General Assembly resolution 63/90, the Subcommittee established a Working Group on National Legislation Relevant to the Peaceful Exploration and Use of Outer Space, open to all members of the Subcommittee, and elected Irmgard Marboe (Austria) as Chairperson;
- (d) The Subcommittee began its work each day with a plenary meeting to hear statements. It subsequently adjourned and, when appropriate, convened meetings of working groups.
- 11. At the 783rd meeting, the Chairman proposed and the Subcommittee agreed that the work of the Subcommittee should continue to be organized flexibly with a view to making the best use of the available conference services.
- 12. The Subcommittee noted with satisfaction that a symposium entitled "Thirtieth anniversary of the Moon Agreement: retrospective and prospects", organized by the International Institute of Space Law (IISL) and the European Centre for Space Law (ECSL), had been held during the 784th meeting, on 23 March. The symposium was coordinated by Tanja Masson-Zwaan, Corinne Jorgenson and Kai-Uwe Schrogl of IISL and Sergio Marchisio of ECSL and was co-chaired by Tanja Masson-Zwaan of IISL and Sergio Marchisio of ECSL.
- 13. The Subcommittee heard the following presentations during the symposium: "The negotiation of the Moon Agreement", by Corinne Jorgenson on behalf of Helmut Türk; "The Moon Agreement: perspective of developing countries", by José Monserrat Filho; "Status of ratifications and key provisions of the Moon Agreement", by Jean-François Mayence; "The common heritage of mankind principle: the Moon and lunar resources", by Juan Manuel de Faramiñán Gilbert; "Is a new look necessary in the age of exploration and exploitation?", by Susan Trepczynski; and "A look ahead: planetary exploration, exploitation and protection", by Mahulena Hofmann.
- 14. Concluding remarks were made by the Chairman of the Subcommittee. The papers and presentations delivered during the symposium were made available on the website of the Office for Outer Space Affairs of the Secretariat (http://www.unoosa.org/oosa/COPUOS/Legal/2009/symposium.html).
- 15. The Subcommittee recommended that its forty-ninth session be held from 22 March to 1 April 2010.

D. Adoption of the report of the Legal Subcommittee

16. At its 802nd meeting, on 3 April, the Subcommittee adopted the present report and concluded the work of its forty-eighth session.

II. General exchange of views

- 17. The Subcommittee welcomed Vladimír Kopal (Czech Republic) as its Chairman for the second consecutive year.
- 18. Statements were made by representatives of the following States members of the Subcommittee during the general exchange of views: Algeria, Austria, Bolivia (Plurinational State of) (on behalf of States members of the Subcommittee that are members of the Group of Latin American and Caribbean States), Brazil, Canada, Chile, China, Cuba, Czech Republic, Ecuador, France, Germany, Greece, India, Indonesia, Iran (Islamic Republic of), Italy, Japan, Malaysia, Morocco, Nigeria, Poland, Republic of Korea, Russian Federation, Saudi Arabia, South Africa, Thailand, Ukraine, United States and Venezuela (Bolivarian Republic of). The views expressed by those speakers are contained in unedited verbatim transcripts (COPUOS/Legal/T.783-792).
- 19. At the 783rd meeting, on 23 March, the Director of the Office for Outer Space Affairs made a statement reviewing the role and work of the Office relating to space law. The Subcommittee noted with appreciation the work of the Office in maintaining the United Nations Register of Objects Launched into Outer Space and the activities of the Office aimed at promoting understanding of, and adherence to, the international legal regime governing activities in outer space.
- 20. The Subcommittee heard a presentation entitled "Findings from Japan's lunar explorer 'Kaguya'", given by the representative of Japan.
- 21. The Subcommittee noted the important role played by initiatives and mechanisms such as the African Leadership Conference on Space Science and Technology for Sustainable Development, the Asia-Pacific Regional Space Agency Forum, the Asia-Pacific Space Cooperation Organization and the Space Conference of the Americas in building regional and international partnerships among States and in promoting cooperation and coordination in the use of space technology and its applications.
- 22. The Subcommittee noted the preparations being undertaken for the Sixth Space Conference of the Americas and that a second meeting of representatives of the pro tempore secretariat of the Fifth Space Conference of the Americas, the International Group of Experts of the Space Conference of the Americas and the Office for Outer Space Affairs had been held in the Galapagos Islands, Ecuador, on 28 and 29 August 2008.
- 23. Some delegations expressed the view that, in responding to the challenges and opportunities posed by the international community's increased reliance on outer space, links should be strengthened between the Committee on the Peaceful Uses of Outer Space and other United Nations entities having an interest in outer space, including the Conference on Disarmament, the General Assembly, in particular its First and Fourth Committees, and the International Telecommunication Union (ITU).
- 24. Some delegations expressed the view that it was essential for the Legal Subcommittee to increase its interaction with the Scientific and Technical Subcommittee in order to promote the elaboration of binding international norms addressing matters relating to, inter alia, the use of nuclear power sources and space

debris, considering the impact and association of those matters with regard to activities and life on the Earth.

- 25. Some delegations expressed the view that strengthening the security of the growing number of activities in outer space was an important objective. Such activities should be guided by three main principles: (a) freedom of access to outer space for peaceful purposes; (b) preservation of the security and integrity of space objects; and (c) due consideration for the legitimate defence interests of States.
- 26. Some delegations expressed the view that attempts to militarize outer space and to use outer space for purposes not consistent with United Nations treaties and principles had become cause for concern. Those delegations were of the view that the placement of weapons in outer space would have a negative effect on the legal regime governing the peaceful uses of outer space and on the entire system of international security.
- 27. Some delegations expressed the view that a lacuna relating to the possible introduction of weapons into outer space existed in the current legal regime governing outer space and that new treaties, as well as strengthening the current regime, were needed to maintain the use of outer space for peaceful purposes.
- 28. The view was expressed that the success of the work of the Legal Subcommittee could be attributed to its ability to focus on practical problems and to seek to address any such problems via a consensus-based and result-oriented process.
- 29. The Subcommittee noted with concern the limited time allotted to the Fourth Committee of the General Assembly to consider the item "International cooperation in the peaceful uses of outer space".

III. Status and application of the five United Nations treaties on outer space

- 30. In accordance with General Assembly resolution 63/90, the Subcommittee considered agenda item 4, entitled "Status and application of the five United Nations treaties on outer space", as a regular item of its agenda and reconvened its Working Group on the item.
- 31. The Subcommittee noted with satisfaction that the Secretariat had distributed a document containing information, updated to 1 January 2009 on States parties and additional signatories to the United Nations treaties and other international agreements relating to activities in outer space (ST/SPACE/11/Rev.2/Add.2). The Subcommittee also noted that, since that date, two additional accessions had been recorded, such that the current status of the five United Nations treaties on outer space was as follows:
- (a) The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, had 100 States parties and had been signed by 26 additional States;

¹ United Nations, Treaty Series, vol. 610, No. 8843.

- (b) The Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space² had 90 States parties and had been signed by 24 additional States;
- (c) The Convention on International Liability for Damage Caused by Space Objects³ had 87 States parties and had been signed by 23 additional States;
- (d) The Convention on Registration of Objects Launched into Outer Space⁴ had 52 States parties and had been signed by 4 additional States;
- (e) The Agreement Governing the Activities of States on the Moon and Other Celestial Bodies⁵ had 13 States parties and had been signed by 4 additional States.
- 32. Some delegations expressed the view that the United Nations treaties on outer space constituted a coherent and valuable framework for the ever-growing scale of space activities. Those delegations welcomed further adherence to the treaties and expressed the hope that States that had not yet ratified or acceded to those treaties would consider becoming parties to them.
- 33. Some delegations expressed the view that it was important to continue efforts towards universal acceptance of the international legal regime governing activities in outer space and to take into account the need to identify new areas that might require regulation and that could be addressed by developing complementary instruments.
- 34. The view was expressed that, while the provisions and principles of the United Nations treaties on outer space constituted the regime to be observed by States and more States should be encouraged to adhere to them, in order to keep pace with advances in space technology the current legal framework for outer space activities required modification in terms of outlining and adopting a set of measures and, where necessary, reviewing key provisions of international space law in a comprehensive, integrated and gradual manner.
- 35. The view was expressed that the existing legal regime should be strengthened in order to cope with new trends in outer space activities, such as those related to the commercialization of outer space and activities being conducted in the private sector, militarization and advances in space technology.
- 36. The view was expressed that the Outer Space Treaty and the other United Nations treaties on outer space played a positive and effective role in regulating national activities and promoting cooperation in space activities.
- 37. The view was expressed that the successful implementation and application of the international legal framework governing space activities depended on understanding and acceptance on the part of policymakers and decision makers of the United Nations treaties and principles on outer space.
- 38. At its 786th meeting, on 24 March, the Subcommittee reconvened its Working Group on the Status and Application of the Five United Nations Treaties on Outer

² Ibid., vol. 672, No. 9574.

³ Ibid., vol. 961, No. 13810.

⁴ Ibid., vol. 1023, No. 15020.

⁵ Ibid., vol. 1363, No. 23002.

Space under the chairmanship of Vassilis Cassapoglou (Greece). The Working Group held six meetings. The Subcommittee, at its 802nd meeting, on 3 April, endorsed the report of the Working Group, contained in annex I to the present report.

- 39. The Subcommittee endorsed the recommendation that the mandate of the Working Group be extended for one additional year. It was agreed that the Subcommittee, at its forty-ninth session, in 2010, would review the need to extend the mandate of the Working Group beyond that period.
- 40. The full text of the statements made during the discussion on this agenda item is contained in unedited verbatim transcripts (COPUOS/Legal/T.786-788 and 802).

IV. Information on the activities of international intergovernmental and non-governmental organizations relating to space law

- 41. In accordance with General Assembly resolution 63/90, the Subcommittee considered, as a regular item of its agenda, agenda item 5, entitled "Information on the activities of international intergovernmental and non-governmental organizations relating to space law".
- 42. For its consideration of the item, the Subcommittee had before it the following:
- (a) Note by the Secretariat (A/AC.105/C.2/L.275 and Corr.1 and Add.1) containing information on activities relating to space law received from the following international organizations: ECSL, IISL, the International Law Association and the International Organization of Space Communications;
- (b) A conference room paper containing information on the activities of the International Mobile Satellite Organization relating to space law (A/AC.105/C.2/2009/CRP.3).
- 43. The Subcommittee noted that the activities of international intergovernmental and non-governmental organizations relating to space law were important and had contributed significantly to the development of space law.
- 44. The Subcommittee recalled that the Rescue Agreement, the Liability Convention, the Registration Convention and the Moon Agreement contained mechanisms permitting international intergovernmental organizations conducting space activities to declare their acceptance of the rights and obligations established under those treaties.
- 45. The Subcommittee agreed that international intergovernmental organizations should consider taking steps to encourage their members to adhere to the outer space treaties, thereby enabling their acceptance of the rights and obligations under those treaties.
- 46. The Subcommittee welcomed the information provided by the observers for ESA and ECSL on the activities of those bodies relating to space law, including the annual summer course on space law and policy, the Manfred Lachs Space Law Moot

- Court Competition, the Practitioner's Forum, other meetings and symposiums supported and organized, and documents and publications made available.
- 47. The Subcommittee welcomed the information provided by the observer for the International Academy of Astronautics (IAA) on the activities of IAA relating to space law, including the preparation of IAA studies and position papers, international conferences held and regional meetings organized for Africa.
- 48. The Subcommittee welcomed the information provided by the observer for IISL on the activities of IISL relating to space law, including the Manfred Lachs Space Law Moot Court Competition, the 51st and 52nd IISL colloquiums, other meetings and symposiums supported or organized and IISL publications and reports.
- 49. The Subcommittee welcomed the information provided by the observer for the International Law Association (ILA) on the activities of ILA relating to space law, including the work undertaken by the ILA Space Law Committee relating to the legal aspects of remote sensing, with special reference to satellite data in international litigation, near-Earth objects and space debris, the registration of space objects, national legislation, and cooperation with the International Law Commission on the responsibility of international organizations.
- 50. The Subcommittee welcomed the information provided by the observer for the International Organization of Space Communications (Intersputnik) on the activities of Intersputnik relating to space law, including cooperation with other international organizations and assistance provided to telecommunications administrations and satellite operators worldwide.
- 51. The Subcommittee agreed that international intergovernmental and non-governmental organizations should again be invited to report to it at its forty-ninth session on their activities relating to space law.
- 52. The full text of the statements made during the discussion on this agenda item is contained in unedited verbatim transcripts (COPUOS/Legal/T.786-789).

V. Matters relating to the definition and delimitation of outer space and the character and utilization of the geostationary orbit, including consideration of ways and means to ensure the rational and equitable use of the geostationary orbit without prejudice to the role of the International Telecommunication Union

- 53. In accordance with General Assembly resolution 63/90, the Subcommittee considered agenda item 6, entitled "Matters relating to the definition and delimitation of outer space and the character and utilization of the geostationary orbit, including consideration of ways and means to ensure the rational and equitable use of the geostationary orbit without prejudice to the role of the International Telecommunication Union", as a regular item of its agenda.
- 54. For its consideration of the item, the Subcommittee had before it the following:

- (a) Note by the Secretariat entitled "Questionnaire on possible legal issues with regard to aerospace objects: replies from Member States" (A/AC.105/635/Add.17);
- (b) Note by the Secretariat entitled "National legislation and practice relating to the definition and delimitation of outer space" (A/AC.105/865/Add.4);
- (c) Note by the Secretariat entitled "Questions on the definition and delimitation of outer space: replies from Member States" (A/AC.105/889 and Add.2 and 3);
- (d) Conference room paper entitled "Questions on the definition and delimitation of outer space", containing replies from Qatar and Saudi Arabia (A/AC.105/C.2/2009/CRP.11);
- (e) Conference room paper entitled "National legislation and practice relating to the definition and delimitation of outer space: reply from Mexico" (A/AC.105/C.2/2009/CRP.15).
- 55. Some delegations expressed concern that little progress had been made on the question of the definition and delimitation of outer space despite the matter having been considered by the Subcommittee for over 40 years. Those delegations reiterated their view that the definition and delimitation of outer space was topical and should therefore continue to be considered by the Subcommittee.
- 56. Some delegations expressed the view that scientific and technological progress, the commercialization of outer space, emerging legal questions and the increasing use of outer space in general had made it necessary for the Subcommittee to consider the question of the definition and delimitation of outer space.
- 57. Some delegations expressed the view that the lack of a definition or delimitation of outer space created legal uncertainty concerning the applicability of space law and air law and that matters concerning State sovereignty and the boundary between airspace and outer space needed to be clarified in order to reduce the possibility of disputes among States.
- 58. Some delegations expressed the view that the definition and delimitation of outer space was of paramount importance in relation to the issue of the liability of States and other entities engaging in space activities, which became particularly topical in the light of the current intensification and diversification of space activities.
- 59. Some delegations expressed the view that the definition and delimitation of outer space was a prerequisite to the establishment of an effective safety regime for outer space activities.
- 60. The view was expressed that the establishment of a definition and delimitation of outer space would create certainty in the sovereignty of States over their airspace and would also enable the effective application of the principles of the freedom of use of outer space and of non-appropriation of outer space. That delegation was of the view that the definition and delimitation of outer space was linked to the definition of space objects.

- 61. Some delegations expressed the view that the definition and delimitation of outer space could lead to unnecessary limitations on the regulation of space activities.
- 62. Some delegations expressed the view that the lack of a definition and delimitation of outer space had not hindered space exploration nor discouraged States from becoming parties to the United Nations treaties on outer space.
- 63. Some delegations expressed the view that the absence of some important definitions in other branches of international law, such as aviation law, environmental law and telecommunications law, had not undermined the effectiveness of regulation of the corresponding activities.
- 64. The view was expressed that there was no need for a definition and delimitation of outer space from a legal perspective and that the delimitation of outer space had already been defined from the perspective of the natural sciences.
- 65. The view was expressed that States should continue to operate under the current framework, which functioned well, until such time as there was a demonstrated need and a practical basis for developing a definition or delimitation of outer space. That delegation was of the view that at the present time any attempt to define and delimit outer space would be a theoretical exercise that could complicate existing activities and that might not be able to anticipate future technological developments.
- 66. The view was expressed that no legal arguments against the need to define and delimit outer space had been put forward in the Subcommittee.
- 67. Some delegations expressed the view that alternative approaches, such as examination of the terms "space object" and "space activities" or consideration of issues of liability for space activities, could be adopted for the definition and delimitation of outer space.
- 68. The view was expressed that progress in the definition and delimitation of outer space could be achieved through cooperation with the International Civil Aviation Organization (ICAO).
- 69. The view was expressed that the definition and delimitation of outer space should not lead to revision or amendment of the United Nations treaties on outer space, which provided a solid and effective basis for the regulation of space activities.
- 70. The view was expressed that current and foreseeable civil aviation operations would not exceed altitudes of 100-130 km, where there was a potential danger of collision with numerous spacecraft. In this connection, that delegation proposed that the boundary between airspace and outer space be established in that range.
- 71. The Subcommittee agreed to request the ICAO secretariat to make, at the forty-ninth session of the Subcommittee, a comprehensive presentation on current and foreseeable civil aviation operations, with particular emphasis on the upper limit of those operations.
- 72. The view was expressed that the Subcommittee should not abstain from the development of legally binding rules relating, among other things, to the definition and delimitation of outer space and the status of the geostationary orbit.

- 73. The view was expressed that the geostationary orbit, as a limited natural resource clearly in danger of saturation, must be used rationally, efficiently, economically and equitably. That principle was deemed fundamental to safeguarding the interests of developing countries and countries with a certain geographical position, as set out in article 44, paragraph 196.2, of the Constitution of the International Telecommunication Union, as amended by the Plenipotentiary Conference held in Minneapolis, United States, in 1998.
- 74. Some delegations expressed the view that the geostationary orbit was a limited natural resource with sui generis characteristics that risked saturation and that equitable access to it should therefore be guaranteed for all States, taking into account in particular the needs of developing countries and the geographical position of certain countries.
- 75. Some delegations expressed the view that access to the geostationary orbit should be provided to States on equitable conditions, taking into account, in particular, the needs and interests of developing countries.
- 76. Some delegations expressed the view that the geostationary orbit was an integral part of outer space and that, therefore, its use should be governed by the provisions of the United Nations treaties on outer space and the ITU regulations.
- 77. Some delegations expressed the view that the current Constitution, Convention and Radio Regulations of ITU, as well as the current procedures set out in the treaties on international cooperation among countries and groups of countries with respect to the geostationary orbit and other orbits, fully took into account the interest of States in the use of the geostationary orbit and the radio frequency spectrum.
- 78. Some delegations expressed the view that the provisions of articles I and II of the Outer Space Treaty made it clear that a party to the Treaty could not appropriate any part of outer space, such as an orbital location in the geostationary orbit, either by claim of sovereignty or by means of use, including repeated use.
- 79. The Subcommittee noted the information provided by the United States on the actions of that Government to further the use of the geostationary orbit and other uniquely situated orbits, such as the free provision of the signal from the global positioning system, information from the polar meteorological satellites of the National Oceanic and Atmospheric Administration of the United States and data from the geostationary operational environmental satellites (GOES). The Subcommittee also noted the cooperation of the Governments of Canada, France, the Russian Federation and the United States in the International Satellite System for Search and Rescue (COSPAS-SARSAT).
- 80. The view was expressed that a balance should be established in the use of the geostationary orbit among States, intergovernmental organizations and private entities. That delegation was of the view that that goal could be achieved through cooperation between the Subcommittee and ITU.
- 81. The view was expressed that, in view of the rapid development of satellite technologies, the Subcommittee could also consider the use of other Earth orbits and that the question of the legal regime governing the geostationary orbit should be considered together with that issue.

- 82. The view was expressed that an effective regime for the geostationary orbit, including a mechanism to monitor that orbit, could be addressed through the establishment of an international specialized space agency.
- 83. At its 783rd meeting, the Subcommittee reconvened its Working Group on the Definition and Delimitation of Outer Space under the chairmanship of José Monserrat Filho (Brazil). In accordance with the agreement reached by the Subcommittee at its thirty-ninth session and endorsed by the Committee on the Peaceful Uses of Outer Space at its forty-third session, the Working Group was convened to consider only matters relating to the definition and delimitation of outer space.
- 84. The Working Group held four meetings. The Subcommittee, at its 799th meeting, on 2 April, endorsed the report of the Working Group, contained in annex II to the present report.
- 85. The full text of the statements made during the discussion on this agenda item is contained in unedited verbatim transcripts (COPUOS/Legal/T.788-797 and 799).

VI. Review and possible revision of the Principles Relevant to the Use of Nuclear Power Sources in Outer Space

- 86. In accordance with General Assembly resolution 63/90, the Subcommittee considered agenda item 7, entitled "Review and possible revision of the Principles Relevant to the Use of Nuclear Power Sources in Outer Space", as a single issue/item for discussion.
- 87. The Legal Subcommittee noted with satisfaction the adoption by the Scientific and Technical Subcommittee, at its forty-sixth session, of the Safety Framework for Nuclear Power Source Applications in Outer Space (A/AC.105/C.1/L.292/Rev.4).
- 88. The Subcommittee also noted with satisfaction the successful cooperation in the development of the Safety Framework between the Scientific and Technical Subcommittee and the International Atomic Energy Agency through the work of the Joint Expert Group of the Scientific and Technical Subcommittee and the International Atomic Energy Agency.
- 89. Some delegations expressed the view that the development of the Safety Framework was a good example of inter-institutional cooperation, which should be encouraged.
- 90. Some delegations expressed the view that the Safety Framework promoted the safe use of nuclear power sources (NPS) in outer space and complemented both existing national and international safety guidelines and standards and those under development.
- 91. The view was expressed that consideration could be given to submitting the Safety Framework to the General Assembly for endorsement by way of a specific resolution.
- 92. With regard to the Safety Framework, the Subcommittee noted the following reservations expressed by the representative of the Bolivarian Republic of Venezuela:

- (a) The inadmissibility of the use of NPS in Earth orbits, based on the premise that any activity conducted in outer space should be governed by the principles of preservation of life and maintenance of peace;
- (b) The responsibility of States for national activities carried out by Government agencies or non-governmental organizations using NPS in outer space; States should ensure the regulation, authorization and monitoring of such activities and that authority may not be delegated in any way.
- 93. Some delegations expressed the view that the review and possible revision of the Principles Relevant to the Use of Nuclear Power Sources in Outer Space (General Assembly resolution 47/68) was closely dependent on further progress being made by the Scientific and Technical Subcommittee in its consideration of the issue of the use of NPS in outer space and on consideration of the Safety Framework by the Committee on the Peaceful Uses of Outer Space and the Commission on Safety Standards of the International Atomic Energy Agency.
- 94. Some delegations were of the view that a revision of the Principles was not warranted.
- 95. Some delegations expressed the view that the Legal Subcommittee should consider revising the current legal regime governing the use of NPS in outer space by developing, on the basis of the Safety Framework, a binding instrument to regulate the use of NPS in outer space.
- 96. The view was expressed that the Principles should be reviewed and revised in a pragmatic manner with a view to accommodating new demands. That delegation was of the view that the use of NPS should be limited to deep-space missions, given the real risk of a collision between space debris and space objects with NPS.
- 97. Some delegations were of the view that serious consideration should be given to the possible impact that missions carrying NPS on board could have on human life and the environment.
- 98. The view was expressed that it was important to adhere rigorously to safety standards when using NPS in outer space.
- 99. The Subcommittee agreed that it was necessary to continue examining the issue and that the item should remain on its agenda.
- 100. The full text of the statements made during the discussion on this agenda item is contained in unedited verbatim transcripts (COPUOS/Legal/T.788-791).

VII. Examination and review of the developments concerning the draft protocol on matters specific to space assets to the Convention on International Interests in Mobile Equipment

101. In accordance with General Assembly resolution 63/90, the Subcommittee considered agenda item 8, entitled "Examination and review of the developments concerning the draft protocol on matters specific to space assets to the Convention on International Interests in Mobile Equipment", as a single issue/item for discussion.

102. At the 794th meeting of the Subcommittee, on 30 March, the Deputy Secretary-General of the International Institute for the Unification of Private Law (Unidroit) read out a statement from Unidroit to the Subcommittee on developments concerning the draft space assets protocol.

103. The Subcommittee noted certain developments that had taken place since its forty-seventh session. The steering committee of Unidroit, established by the General Assembly of Unidroit to build consensus around provisional conclusions reached during intersessional work by government and industry, had made good progress in identifying appropriate solutions to the key outstanding issues. At its first meeting, held in Berlin from 7 to 9 May 2008, the steering committee had achieved consensus on some of those issues and had prepared an alternative version of the draft space assets protocol that reflected the decisions taken at that meeting. The alternative version, together with the results of meetings of the subcommittees of the steering committee on default remedies in respect of components and public service, would be considered by the steering committee at its second meeting, to be held in Paris on 14 and 15 May 2009, with a view to assessing the possibility of reconvening the committee of governmental experts in Rome from 30 November to 4 December 2009 and adopting the draft space assets protocol at a diplomatic conference in the third quarter of 2010.

104. Some delegations expressed their support for the progress made on the draft space assets protocol and looked forward to the continuation and successful completion of the drafting process.

105. Some delegations expressed the view that the draft space assets protocol offered an opportunity to facilitate the expansion of the commercial space sector by setting up a framework through which States could support a system of asset-based financing. Those delegations were of the view that the draft protocol would allow a broader range of States, in all regions and at all levels of economic development, to benefit from that expansion by providing a better opportunity to acquire interests in space equipment and to acquire services generated by space equipment.

106. Some delegations stated that the future space assets protocol was intended to address only the distinct and important issue of financing for commercial space activities and was not intended to affect the rights and obligations of parties to the United Nations treaties on outer space or the rights and obligations of States members of ITU under the Constitution, Convention and Radio Regulations of ITU and that that principle would be explicit in the text of any space assets protocol. Those delegations also stated that, while the draft space assets protocol would ultimately be negotiated by States members of Unidroit through the Unidroit process, that process had already included many States members of the Subcommittee and consideration of requests from States not members of Unidroit that wished to participate.

107. The view was expressed that the United Nations could act as the supervisory authority under the future space assets protocol, which would enhance the role of the United Nations in promoting international cooperation for the benefit of all States and in further developing international law.

108. The view was expressed that, owing to the lack of consensus, further consideration of the possibility of the United Nations serving as the supervisory

authority for the registry under the draft space assets protocol was not deemed

- 109. The view was expressed that implementation of the future protocol must not affect the orbital slots and frequency spectrum bands allocated to States in accordance with the established rules of ITU, because it was possible that, in the case of default, the financier taking control of the space asset might seek to make use of those orbital slots and frequency spectrum bands.
- 110. The view was expressed that a major unresolved issue concerned the competence of national courts to enforce judicial decisions on matters related to outer space.
- 111. The Subcommittee expressed its satisfaction with the participation of the Office for Outer Space Affairs as an observer in the negotiating sessions of Unidroit and agreed that the Office should continue participating in those sessions.
- 112. The Subcommittee agreed that this item should remain on the agenda for its forty-ninth session, in 2010.
- 113. The full text of statements made by delegations during the discussion on agenda item 8 is contained in unedited verbatim transcripts (COPUOS/Legal/T.791-794).

VIII. Capacity-building in space law

- 114. In accordance with General Assembly resolution 63/90, the Subcommittee considered, as a single issue/item for discussion, agenda item 9, entitled "Capacity-building in space law".
- 115. For its consideration of the item, the Subcommittee had before it the following:
- (a) Conference room paper containing a directory of education opportunities in space law (A/AC.105/C.2/2009/CRP.4);
- (b) Conference room paper containing the preliminary draft education curriculum on space law (A/AC.105/C.2/2009/CRP.5);
- (c) Conference room paper containing information submitted by China, the Czech Republic, Germany, Japan, Poland and Saudi Arabia and by the Office for Outer Space Affairs on actions and initiatives to build capacity in space law (A/AC.105/C.2/2009/CRP.7);
- (d) Conference room paper containing information submitted by France on actions and initiatives to build capacity in space law (A/AC.105/C.2/2009/CRP.7/Add.1).
- 116. The Subcommittee agreed that capacity-building, training and education in space law were of paramount importance to national, regional and international efforts to further develop the practical aspects of space science and technology and to increase knowledge of the legal framework within which space activities were carried out, and emphasized the important role of the Subcommittee in that regard.

- 117. The view was expressed that active dissemination of knowledge, experiences and best practices in space law was needed to provide the necessary basis for supporting the rapid development of space technology.
- 118. Some delegations expressed the view that the general exchange of information on national legislation relevant to the peaceful exploration and use of outer space, the subject of deliberations under agenda item 11, enabled States with effective legal regimes in space law to provide other States with concrete examples and information on space-related legislation, thereby contributing to building capacity in space law.
- 119. The Subcommittee noted with appreciation that a number of national, regional and international efforts to build capacity in space law were being undertaken by governmental and non-governmental entities and institutions. Those efforts included encouraging universities to offer modules on space law as part of existing international law courses or as specialized programmes; providing fellowships for graduate and postgraduate education in space law; assisting in the development of national space legislation and policy frameworks; organizing workshops, seminars and other activities to promote greater understanding of space law; conducting research and preparing studies, papers and publications; supporting space law moot court competitions; and supporting entities dedicated to the study of and research relating to space law.
- 120. The Subcommittee welcomed the fact that, in response to its request at its forty-sixth session, the Office for Outer Space Affairs had continued to work with space law educators and representatives of the regional centres for space science and technology education, affiliated to the United Nations, to develop a curriculum on space law and agreed that the preliminary draft of that curriculum, as contained in conference room paper A/AC.105/C.2/2009/CRP.5, was a positive step forward.
- 121. The Subcommittee expressed its appreciation to the educators and representatives of the regional centres for their work in developing the curriculum and agreed that the curriculum was a tool for the dissemination of knowledge on space law, especially in developing countries, and represented an important contribution to building capacity in space law.
- 122. The Subcommittee recommended that comments on the preliminary draft curriculum on space law be transmitted by member States in writing, through the Office for Outer Space Affairs, to the educators and representatives of the regional centres participating in the development of the curriculum, for their consideration.
- 123. The Subcommittee recommended that the curriculum be structured in such a manner that it might also serve as a basis for other educational institutions and training initiatives.
- 124. The Subcommittee noted that the regional centres for space science and technology education, affiliated to the United Nations, could play an important role in supporting capacity-building in space law.
- 125. The view was expressed that, in order for the regional centres for space science and technology education to undertake the additional challenge of building capacity in space law, the current lack of adequate support for their activities, particularly with respect to expertise and material resources, would need to be addressed.

- 126. Some delegations expressed the view that the regional centres would also need additional financial resources and experts to teach space law.
- 127. The view was expressed that the Office for Outer Space Affairs should, in cooperation with IISL, develop a short lecture on space law for distance-learning purposes.
- 128. The Subcommittee noted with satisfaction that the Office for Outer Space Affairs had updated the directory of education opportunities in space law, including information on available fellowships and scholarships.
- 129. The view was expressed that a consultative group, consisting of educational institutions reflected in the directory, should be established as a network to support the work of the Subcommittee under this item.
- 130. The Subcommittee noted that the workshops organized by the Office for Outer Space Affairs were a valuable contribution to capacity-building in space law.
- 131. The Subcommittee noted that the Islamic Republic of Iran would act as host to the next United Nations workshop on space law, to be held in Tehran in November 2009.
- 132. The Subcommittee also noted that the Office for Outer Space Affairs had continued to provide technical legal advisory support to member States on issues relating to space law and had participated in other initiatives to build capacity in space law, including the Seventeenth ECSL Summer Course on Space Law and Policy, held in Genoa, Italy, from 1 to 12 September 2008, and a regional seminar on space law, hosted by the Government of Ecuador, held in Quito on 26 and 27 August 2008.
- 133. The Subcommittee noted that ESA and ECSL had supported the organization of space law activities in African countries bordering the Mediterranean.
- 134. The Subcommittee noted that the scholarship programmes of the German Academic Exchange Service and the Alexander von Humboldt Foundation of Germany offered numerous study and research opportunities in all areas of study and that those programmes were open to students, graduates and academics from developing countries.
- 135. The Subcommittee noted that the courses on space law offered by public education institutions in France and Greece were free of charge for national and foreign students and that scholarships could be made available for foreign students.
- 136. Some delegations expressed the view that additional efforts were needed, including by the Office for Outer Space Affairs, to encourage more institutions and organizations from developed countries to provide scholarships for students from developing countries with a view to strengthening space law, in line with the recommendations of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III).
- 137. Some delegations expressed the view that special measures were necessary to address the lack of opportunities for education in space law in Africa, particularly in sub-Saharan Africa, and the limited availability in the region of local experts to teach space law.

- 138. The view was expressed that, in order to build capacity in space law, the Office for Outer Space Affairs should consider contributing to, and participating in, the African Leadership Conference on Space Science and Technology for Sustainable Development, including by establishing a practitioners' forum similar to that organized by ECSL.
- 139. The view was expressed that the creation of centres of excellence to train experts in space law would support capacity-building in space law, particularly in developing countries, and that training opportunities with space-related organizations and institutions should be established.
- 140. The view was expressed that a regional centre for space science and technology education for the benefit of Arabic-speaking countries should be established.
- 141. The Subcommittee noted with appreciation that an international centre for space law would be established by the Governments of Argentina and Brazil.
- 142. The view was expressed that the creation of a dedicated space law database and Web-based electronic resources and the establishment of forums for practitioners would facilitate networking among space law experts.
- 143. Some delegations expressed the view that the Office for Outer Space Affairs should deepen and strengthen its programme to build capacity in space law, notwithstanding the expected budgetary cut for the biennium 2010-2011.
- 144. The Subcommittee requested the Office for Outer Space Affairs to prepare a report for the forty-ninth session of the Subcommittee setting out the recommendations relating to capacity-building in space law made to date and the status of their implementation and proposing ways and means of giving practical effect to those recommendations.
- 145. The Subcommittee recommended that member States and permanent observers of the Committee on the Peaceful Uses of Outer Space inform the Subcommittee, at its forty-ninth session, of any actions taken or planned at the national, regional or international level to build capacity in space law.
- 146. The Subcommittee recommended that the United Nations University be invited to report on its activities relating to capacity-building in space law.
- 147. The full text of the statements made by delegations during the discussion on agenda item 9 is contained in unedited verbatim transcripts (COPUOS/Legal/T.790-794).

IX. General exchange of information on national mechanisms relating to space debris mitigation measures

- 148. In accordance with General Assembly resolution 63/90, the Subcommittee considered agenda item 10, entitled "General exchange of information on national mechanisms relating to space debris mitigation measures", as a single issue/item for discussion.
- 149. The Subcommittee heard the following presentations:

- (a) "Space debris mitigation mechanisms in Japan: the case in JAXA", by the representative of Japan;
- (b) "Implementation mechanisms for space debris mitigation guidelines by DLR", by the representative of Germany;
- (c) "The Russian Federation's activities on space debris mitigation in near-Earth space: examples of implementation of the COPUOS Space Debris Mitigation Guidelines", by the representative of the Russian Federation;
- (d) "Requirements on space debris mitigation for ESA projects", by the observer for ESA.
- 150. The Subcommittee welcomed the inclusion of this item in the agenda, noting that it would assist States in understanding the different approaches that States had taken to mitigating and preventing the increase in space debris.
- 151. The Subcommittee noted with satisfaction that the endorsement by the General Assembly, in its resolution 62/217, of the Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space⁶ was a key step in providing space-faring nations with guidance on how to mitigate the problem of space debris.
- 152. The delegations of the following States presented information on their national mechanisms governing space debris mitigation and the ways in which they were implementing the Space Debris Mitigation Guidelines of the Inter-Agency Space Debris Coordination Committee and the Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space: Canada, China, France, India, Italy, Japan, Russian Federation and United States.
- 153. The Subcommittee noted that some States had strengthened their national mechanisms governing space debris mitigation through the nomination of governmental supervisory authorities, the involvement of academia and industry and the development of new legislative norms, instructions, standards and frameworks.
- 154. The view was expressed that space debris posed an obvious danger to all space assets and that the orderly conduct of space activities would depend on the observance of space debris mitigation guidelines by all States.
- 155. The view was expressed that the problem of space debris was part of the complex issue of the protection and preservation of the outer space environment.
- 156. The view was expressed that States should exercise greater control over private operators of space telecommunications systems as the activities of those operators largely contributed to the creation of space debris.
- 157. The view was expressed that the development by the Subcommittee of guidelines for space traffic management could contribute to resolving the problem of space debris.
- 158. The view was expressed that the taking by States of effective measures to mitigate the problem of space debris, including the implementation of the Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer

⁶ Official Records of the General Assembly, Sixty-second Session, Supplement No. 20 (A/62/20), paras. 117 and 118 and annex.

Space, would ensure that the future space activities of States, in particular of developing States, would not be negatively affected by space debris.

- 159. The Subcommittee agreed that the collision and other incidents that had occurred in space in recent years underlined the need for space-faring nations to coordinate their activities in a transparent and responsible manner through the tracking, monitoring and dissemination of information on space debris.
- 160. The Subcommittee urged States to continue to implement the Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space and to study the experience of States that had already established national mechanisms governing space debris mitigation.
- 161. The Subcommittee requested the Secretariat to explore possibilities for publishing the text of the Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space in a way that would make the Guidelines more accessible to all Member States.
- 162. The full text of the statements made during the discussion on agenda item 10 is contained in unedited verbatim transcripts (COPUOS/Legal/T.792-796).

X. General exchange of information on national legislation relevant to the peaceful exploration and use of outer space

- 163. In accordance with General Assembly resolution 63/90, agenda item 11, entitled "General exchange of information on national legislation relevant to the peaceful exploration and use of outer space", was considered in accordance with the multi-year workplan for the period 2008-2011 adopted by the Committee on the Peaceful Uses of Outer Space at its fiftieth session.⁷
- 164. The Subcommittee recalled that, in accordance with the multi-year workplan, States were to submit information on their respective national space legislation and regulatory frameworks.
- 165. For its consideration of the item, the Subcommittee had before it the following:
- (a) Note by the Secretariat entitled "Information on national legislation relevant to the peaceful exploration and use of outer space", containing replies received from China, the Czech Republic, Germany, Mongolia, the Republic of Korea and Turkey (A/AC.105/932);
- (b) Conference room paper containing information on the national legislation of Poland and Saudi Arabia relevant to the peaceful exploration and use of outer space (A/AC.105/C.2/2009/CRP.9);
- (c) Conference room paper containing information on the national legislation of South Africa relevant to the peaceful exploration and use of outer space (A/AC.105/C.2/2009/CRP.13);

⁷ Ibid., para. 219.

- (d) Conference room paper containing information on the national legislation of the Republic of Korea relevant to the peaceful exploration and use of outer space (A/AC.105/C.2/2009/CRP.14);
- (e) Conference room paper containing information on the national legislation of Japan relevant to the peaceful exploration and use of outer space (A/AC.105/C.2/2009/CRP.17);
- (f) Conference room paper containing information on the national legislation of France relevant to the peaceful exploration and use of outer space (A/AC.105/C.2/2009/CRP.18).
- 166. The Subcommittee heard the following presentations:
 - (a) "French space law", by the representative of France;
 - (b) "Belgian space law", by the representative of Belgium;
 - (c) "Japan's basic space law", by the representative of Japan;
- (d) "Comments from EUTELSAT IGO on French space law", by the observer for the European Telecommunications Satellite Organization (EUTELSAT IGO).
- 167. The Subcommittee noted with satisfaction that the general exchange of information on national legislation relevant to the peaceful exploration and use of outer space provided States with a comprehensive overview of the current status of national space laws and regulations. The Subcommittee also noted that the information was considered valuable; that it allowed all States, in particular developing States, to gain an understanding of existing national regulatory frameworks; and that it could assist States in their efforts to establish their own national regulatory frameworks in accordance with their specific needs and level of development.
- 168. The Subcommittee noted with appreciation that, as space activities continued to increase in number and scope and as they were carried out by governmental and non-governmental actors, a growing number of developing countries had adopted national space policies and had included legal provisions dealing with outer space in their national legal regimes.
- 169. The Subcommittee also noted with appreciation the increasing number of space-related international cooperation programmes and projects. In that connection, the Subcommittee noted the importance of the development of space legislation by States, as that legislation played a significant role in regulating and promoting such cooperation activities.
- 170. The Subcommittee noted with satisfaction the strengthening of efforts by States to promote and develop international space law, in particular in view of the increase in problems associated with the exploration and uses of outer space, such as the problem of space debris.
- 171. The Subcommittee took note with satisfaction of the database maintained by the Office for Outer Space Affairs, on its website (http://www.unoosa.org), on national space legislation and multilateral and bilateral agreements related to the peaceful exploration and use of outer space. The Subcommittee encouraged States to continue to submit to the Office, for inclusion in the database, the texts of laws and

regulations, as well as of policy and other legal documents, related to space activities.

- 172. The view was expressed that States should be encouraged to make available, for inclusion in the database, official translations in English, in French or in both languages of their national laws.
- 173. The Subcommittee agreed that the agenda item on the general exchange of information on national legislation was closely linked to the agenda item on capacity-building in space law, since capacity-building efforts were important in promoting understanding of national requirements for space activities, especially given the different constitutional and legal systems of Member States. The dissemination of such information could stimulate the development of national space laws and would significantly enhance international cooperation, in particular for the benefit of developing countries.
- 174. The view was expressed that the sharing of information on national legislation and the possible harmonization of such information could help States to improve the legal framework of international cooperation in space activities and could also facilitate consensus on the direction for the development of international space law.
- 175. The view was expressed that, in the further development of international space law, full consideration should be given to bilateral and regional agreements, as those legal instruments provided an essential foundation for international cooperation in the exploration and use of outer space.
- 176. The view was expressed that the availability of information on the activities of international intergovernmental and non-governmental organizations relating to space law would greatly assist States in developing national space legislation.
- 177. The view was expressed that an exchange of information on national space legislation would promote both the acceptance and the implementation of the principles and provisions enshrined in the United Nations treaties on outer space.
- 178. The view was expressed that the examination of existing legislation and practices would help States to identify common principles, norms and procedures, as well as the solutions best suited to different national interests, needs and specificities. That delegation was of the view that such exchanges of information on national legislation could also contribute to the further development and strengthening of the international space law regime.
- 179. Some delegations expressed concern about the lack of regulation, in view of the increasing number of space activities carried out by commercial entities and non-governmental organizations, and thus felt that, if warranted, the issue could be further considered by the Subcommittee under this agenda item.
- 180. At its 783rd meeting, the Subcommittee established the Working Group on National Legislation Relevant to the Peaceful Exploration and Use of Outer Space, under the chairmanship of Irmgard Marboe (Austria). In accordance with the multi-year workplan, the Working Group examined responses received from Member States in order to develop an understanding of the manner in which Member States regulated governmental and non-governmental space activities.

- 181. The Working Group held six meetings. The Subcommittee, at its 802nd meeting, on 3 April, endorsed the report of the Working Group contained in annex III to the present report.
- 182. The full text of the statements made during the discussion on agenda item 11 is contained in unedited verbatim transcripts (COPUOS/Legal/T.792-796 and 802).

XI. Proposals to the Committee on the Peaceful Uses of Outer Space for new items to be considered by the Legal Subcommittee at its forty-ninth session

- 183. The Subcommittee recalled that the General Assembly, in its resolution 63/90, had noted that the Subcommittee, at its forty-eighth session, would submit its proposals to the Committee on the Peaceful Uses of Outer Space for new items to be considered by the Subcommittee at its forty-ninth session, in 2010.
- 184. The Chairman recalled the proposals for new items to be included in the agenda of the Subcommittee that had been considered by the Subcommittee at its forty-seventh session and retained by their sponsors with a view to discussing them at subsequent sessions of the Subcommittee (see A/AC.105/917, para. 160).
- 185. The Subcommittee agreed to retain all the single issues/items currently on the agenda for consideration at its forty-ninth session.
- 186. The Subcommittee agreed on the following items to be proposed to the Committee on the Peaceful Uses of Outer Space for inclusion in the agenda of the Subcommittee at its forty-ninth session:

Regular items

- 1. Opening of the session, election of the Chairman and adoption of the agenda.
- 2. Statement by the Chairman.
- 3. General exchange of views.
- 4. Status and application of the five United Nations treaties on outer space.
- 5. Information on the activities of international intergovernmental and non-governmental organizations relating to space law.
- 6. Matters relating to:
 - (a) The definition and delimitation of outer space;
 - (b) The character and utilization of the geostationary orbit, including consideration of ways and means to ensure the rational and equitable use of the geostationary orbit without prejudice to the role of the International Telecommunication Union.

Single issues/items for discussion

7. Review and possible revision of the Principles Relevant to the Use of Nuclear Power Sources in Outer Space.

- 8. Examination and review of the developments concerning the draft protocol on matters specific to space assets to the Convention on International Interests in Mobile Equipment.
- 9. Capacity-building in space law.
- 10. General exchange of information on national mechanisms relating to space debris mitigation measures.

Items considered under workplans

11. General exchange of information on national legislation relevant to the peaceful exploration and use of outer space.

2010: Continued examination, by a working group, of responses received and initiation of drafting of the working group's report, including conclusions.

New items

12. Proposals to the Committee on the Peaceful Uses of Outer Space for new items to be considered by the Legal Subcommittee at its fiftieth session.

187. The Subcommittee also agreed that the Working Group on the Status and Application of the Five United Nations Treaties on Outer Space, the Working Group on Matters Relating to the Definition and Delimitation of Outer Space and the Working Group on National Legislation Relevant to the Peaceful Exploration and Use of Outer Space should be reconvened at its forty-ninth session.

188. The Subcommittee further agreed to review, at its forty-ninth session, the need to extend beyond that session the mandate of the Working Group on the Status and Application of the Five United Nations Treaties on Outer Space.

189. The Subcommittee further agreed that IISL and ECSL should again be invited to organize a symposium, to be held during the first week of its forty-ninth session.

190. Some delegations proposed a new agenda item on regulation of the dissemination of Earth observation satellite images through the World Wide Web. Those delegations were of the view that irresponsible dissemination of space-based images, in particular through the World Wide Web, seriously undermined the privacy of citizens worldwide, as well as the sovereignty and national security of States.

191. Some delegations expressed the view that, while those concerns were valid and relevant to the discussions of the Committee on the Peaceful Uses of Outer Space, it was too early to consider them in the Legal Subcommittee.

192. The Subcommittee noted a proposal by Colombia that, under the existing regular agenda item 6 (b), entitled "The character and utilization of the geostationary orbit, including consideration of ways and means to ensure the rational and equitable use of the geostationary orbit without prejudice to the role of the International Telecommunication Union", the Subcommittee should play a role in a contribution to be made by the Committee to the work of ITU, in particular to (a) the ITU workshop to be organized on the use of spectral orbit resources; (b) the study to be carried out by Working Party 4A of the ITU Radiocommunication Sector

- in 2011; and (c) the ITU World Radiocommunication Conference to be held in the second half of 2011.
- 193. The view was expressed that the consideration of those issues by the Committee would infringe on the role and mandates of ITU.
- 194. The Subcommittee noted that the sponsors of the following proposals for new items to be included on its agenda intended to retain their proposals for possible discussion at subsequent sessions of the Subcommittee:
- (a) Review of the Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting, with a view to transforming the text into a treaty in the future (proposed by Greece);
- (b) Review of existing norms of international law applicable to space debris (proposed by the Czech Republic and Greece);
- (c) Matters relating to the Principles Relating to Remote Sensing of the Earth from Outer Space (proposed by Chile and Colombia);
- (d) Review of the Principles Relating to Remote Sensing of the Earth from Outer Space, with a view to transforming them into a treaty in the future (proposed by Greece);
- (e) The appropriateness and desirability of drafting a universal comprehensive convention on international space law (proposed by China, Greece, the Russian Federation and Ukraine);
- (f) Legal implications of space applications for global climate change (proposed by Chile);
- (g) Regulation of the dissemination of Earth observation satellite images through the World Wide Web (proposed by Saudi Arabia).
- 195. The full text of the statements made during the discussion on agenda item 12 is contained in unedited verbatim transcripts (COPUOS/Legal/T.796-799).

Annex I

Report of the Chairman of the Working Group on the Status and Application of the Five United Nations Treaties on Outer Space

- 1. In accordance with paragraph 6 of General Assembly resolution 63/90, the Legal Subcommittee of the Committee on the Peaceful Uses of Outer Space, at its 786th meeting, on 24 March 2009, reconvened its Working Group on the Status and Application of the Five United Nations Treaties on Outer Space under the chairmanship of Vassilis Cassapoglou (Greece).
- 2. The Working Group held six meetings, from 24 March to 3 April 2009. At the 1st meeting, on 24 March, the Chairman recalled that the Subcommittee, at its fortieth session, in 2001, had agreed that the discussions of the Working Group would include the status of the United Nations treaties on outer space, review of their implementation and obstacles to their universal acceptance, as well as the promotion of space law, especially through the United Nations Programme on Space Applications (A/AC.105/763 and Corr.1, para. 118). The Chairman also recalled that the Subcommittee, at its forty-first session, in 2002, had agreed that the Working Group could consider any new, similar issues that might be raised in discussions in the Working Group, provided that those issues fell within the existing mandate of the Working Group (A/AC.105/787, paras. 138 and 140).
- 3. The Working Group had before it the following documents:
- (a) Note by the Secretariat on activities being carried out or to be carried out on the Moon and other celestial bodies, international and national rules governing those activities and information received from States parties to the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies about the benefits of adherence to that Agreement (A/AC.105/C.2/L.271, Corr.1 and Add.1);
- (b) Note by the Secretariat on the joint statement on the benefits of adherence to the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies by States parties to the Agreement (A/AC.105/C.2/L.272).
- 4. The Chairman recalled the agreement of the Subcommittee relating to the work to be conducted by the Working Group at its meetings held during the forty-eighth session of the Subcommittee, namely:
- (a) That the Working Group would not discuss the list of questions contained in the questionnaire on the possible options for future development of international space law (A/AC.105/C.2/L.259), but would instead discuss the current state of international space law and possible options for its future development, as necessary;
- (b) That, in addressing the low rate of participation of States in the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, a the Working Group could:

^a United Nations, Treaty Series, vol. 1363, No. 23002.

- (i) Address activities currently being carried out or to be carried out on the Moon and other celestial bodies in the near future;
- (ii) Identify the benefits of adherence to the Moon Agreement;
- (iii) Identify the international and national rules governing activities on the Moon and other celestial bodies;
- (iv) Assess whether existing international rules adequately addressed activities on the Moon and other celestial bodies.
- 5. The Chairman also recalled that the Subcommittee would review the need to extend beyond its forty-eighth session the mandate of the Working Group (A/AC.105/917, para. 44).
- 6. The Working Group welcomed the fact that the milestone of 100 States parties to the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies^b had been reached.
- 7. The Working Group requested the Secretariat to retransmit the letter encouraging Governments to consider adherence to the United Nations treaties on outer space, dated 9 December 2004, to the ministries of foreign affairs of Member States that had not yet become party to the five United Nations treaties on outer space and agreed that a similar letter should be sent to international intergovernmental organizations conducting space activities, seeking clarification on their possible declaration of acceptance of the rights and obligations under the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, the Convention on International Liability for Damage Caused by Space Objects, the Convention on Registration of Objects Launched into Outer Space and the Moon Agreement.
- 8. Some delegations expressed the view that, although the Moon Agreement contained provisions that reiterated or elaborated on the provisions contained in the Outer Space Treaty, certain provisions of the Moon Agreement were unique and provided more detailed regulations for the implementation of activities on the Moon.
- 9. Some delegations expressed the view that there were certain inconsistencies between the principle of "common heritage of mankind" expressed in article 11 of the Moon Agreement and the principle of "province of all mankind" enshrined in article I of the Outer Space Treaty and expressed the need for a clarification of those principles.
- 10. Some delegations expressed the view that the principle of "common heritage of mankind" and the principle of "province of all mankind" had separate scopes and targeted different activities, relating to the exploitation of resources on the Moon and other celestial bodies on the one hand, and to the general exploration and use of outer space on the other.

^b Ibid., vol. 610, No. 8843.

c Ibid., vol. 672, No. 9574.

^d Ibid., vol. 961, No. 13810.

e Ibid., vol. 1023, No. 15020.

- 11. Some delegations recognized that the joint statement on the benefits of adherence to the Moon Agreement by States parties to the Agreement, contained in document A/AC.105/C.2/L.272, was a useful basis for further discussion.
- 12. Some delegations expressed the view that some of the aspects of the Moon Agreement emphasized in the joint statement needed further clarification, in particular the scope of application of article 10 (on safeguarding the life and health of persons on the Moon), article 12 (on the use of and jurisdiction over personnel, vehicles, equipment, facilities, stations and installations) and article 15 (on compliance).
- 13. The view was expressed that the reasons preventing States from becoming parties to the Moon Agreement needed to be explored more fully in order to find appropriate solutions to overcome those obstacles.
- 14. The view was expressed that, although the impact of the Moon Agreement was limited owing to the low number of States parties, the Agreement nevertheless maintained its legal validity.
- 15. The view was expressed that it was premature to arrive at any conclusions on the adequacy of existing international rules governing the Moon and other celestial bodies, as a fuller picture was needed of the activities concerning the Moon and of the relevant national legal frameworks.
- 16. The Working Group noted with appreciation that an interdisciplinary seminar on issues related to the Moon Agreement would be organized by Austria in connection with the forty-ninth session of the Subcommittee, in 2010.
- 17. The Working Group agreed to continue its discussion on the issues referred to in paragraph 4 (b) above at its meetings to be held during the forty-ninth session of the Subcommittee, in 2010.
- 18. The Working Group recommended that the Subcommittee, at its forty-ninth session, in 2010, reconvene the Working Group and review the need to extend the mandate of the Working Group beyond that session.

Annex II

Report of the Chairman of the Working Group on the Definition and Delimitation of Outer Space

- 1. At its 783rd meeting, on 23 March 2009, the Legal Subcommittee of the Committee on the Peaceful Uses of Outer Space reconvened its Working Group on the Definition and Delimitation of Outer Space under the chairmanship of José Monserrat Filho (Brazil).
- 2. The Chairman drew the attention of the Working Group to the fact that, in accordance with General Assembly resolution 63/90, the Working Group had been convened to consider only matters relating to the definition and delimitation of outer space.
- 3. The Working Group had before it the following:
- (a) Note by the Secretariat entitled "Questionnaire on possible legal issues with regard to aerospace objects: replies from Member States" (A/AC.105/635/Add.17);
- (b) Note by the Secretariat entitled "National legislation and practice relating to the definition and delimitation of outer space" (A/AC.105/865/Add.4);
- (c) Note by the Secretariat entitled "Questions on the definition and delimitation of outer space: replies from Member States" (A/AC.105/889/Add.2 and 3);
- (d) Conference room paper entitled "Questions on the definition and delimitation of outer space", containing replies from Qatar and Saudi Arabia (A/AC.105/C.2/2009/CRP.11);
- (e) Conference room paper entitled "National legislation and practice relating to definition and delimitation of outer space: reply from Mexico" (A/AC.105/C.2/2009/CRP.15).
- 4. Some delegations were of the view that the delimitation of outer space would help States to avoid possible problems connected with the rapid development of space technologies and the growing number of activities of States and private entities in the exploration and use of outer space.
- 5. The view was expressed that the lack of a definition or delimitation of outer space created legal uncertainty concerning the applicability of space law and air law and that matters concerning State sovereignty and the boundary between airspace and outer space needed to be clarified in order to reduce the possibility of disputes among States.
- 6. The view was expressed that, despite the absence of certain important definitions in international air law, aviation activities continued to develop well.
- 7. Some delegations were of the view that States should continue to operate under the current framework, which had functioned well, and that, at the present time, any attempt to define or delimit outer space would be a theoretical exercise

that could complicate existing activities and that might not be able to anticipate future technological developments.

- 8. The view was expressed that no definition or delimitation of outer space was needed for practical purposes and that it would be more useful to determine the scope of application of international space law by analysing the purpose of space missions.
- 9. The view was expressed that it was important to strengthen existing international space law, in particular with regard to responsibility for and supervision of space activities, and that an international specialized space agency should be established for that purpose.
- 10. The view was expressed that the definition and delimitation of outer space would strengthen security and confidence in outer space activities.
- 11. The view was expressed that the defining and delimiting of outer space should not lead to revision or amendment of the United Nations treaties on outer space, which provided a solid and effective basis for the regulation of space activities.
- 12. Some delegations were of the view that alternative approaches to the definition and delimitation of outer space should be given serious consideration.
- 13. On the basis of its discussions, the Working Group agreed:
- (a) To continue to invite States members of the Committee on the Peaceful Uses of Outer Space to submit information on national legislation or any national practices that might exist or were being developed that related directly or indirectly to the definition and/or delimitation of outer space and airspace, taking into account the current and foreseeable level of development of space and aviation technologies;
- (b) To continue to address the following questions, through the Secretariat, to the Governments of Member States:
 - (i) Does your Government consider it necessary to define outer space and/or to delimit airspace and outer space, given the current level of space and aviation activities and technological development in space and aviation technologies? Please provide a justification for the answer; or
 - (ii) Does your Government consider another approach to solving this issue? Please provide a justification for the answer.
- 14. The Working Group noted the proposal of the Chairman that the topic for the symposium to be organized by the International Institute of Space Law and the European Centre for Space Law in the framework of the forty-ninth session of the Subcommittee, in 2010, could relate to the issue of the definition and delimitation of outer space.
- 15. Some delegations expressed the view that the definition and delimitation of outer space remained a topical and important issue that should continue to be considered by the Working Group.

Annex III

Report of the Chairperson of the Working Group on National Legislation Relevant to the Peaceful Exploration and Use of Outer Space

- 1. In accordance with paragraph 8 of General Assembly resolution 63/90, the Legal Subcommittee of the Committee on the Peaceful Uses of Outer Space, at its 783rd meeting, on 23 March 2009, established a working group on agenda item 11, entitled "General exchange of information on national legislation relevant to the peaceful exploration and use of outer space". The Working Group on National Legislation Relevant to the Peaceful Exploration and Use of Outer Space was chaired by Irmgard Marboe (Austria).
- 2. The Working Group held six meetings, from 31 March to 3 April 2009. At the 1st meeting, the Chairperson recalled that, in accordance with the workplan adopted by the Committee on the Peaceful Uses of Outer Space at its fiftieth session, in 2007, the Working Group would examine responses received from Member States to requests for information on national legislation relating to governmental and non-governmental space activities in order to develop an understanding of the manner in which Member States had regulated those activities. The Chairperson also recalled the work of the Subcommittee under the previous agenda items "Review of the concept of the 'launching State'" and "Practice of States and international organizations in registering space objects", and noted that, under those items, the Subcommittee and its respective working groups had considered information received from Member States on national regulatory frameworks.
- 3. The Working Group had before it the following:
- (a) Note by the Secretariat entitled "Information on national legislation relevant to the peaceful exploration and use of outer space", containing replies received from China, the Czech Republic, Germany, Mongolia, the Republic of Korea and Turkey (A/AC.105/932);
- (b) Conference room paper containing information received from Poland and Saudi Arabia on national legislation relevant to the peaceful exploration and use of outer space (A/AC.105/C.2/2009/CRP.9);
- (c) Conference room paper containing information received from South Africa on national legislation relevant to the peaceful exploration and use of outer space (A/AC.105/C.2/2009/CRP.13);
- (d) Conference room paper containing information received from the Republic of Korea on national legislation relevant to the peaceful exploration and use of outer space (A/AC.105/C.2/2009/CRP.14);
- (e) Conference room paper entitled "National legislation and practice relating to the definition and delimitation of outer space: reply from Mexico" (A/AC.105/C.2/2009/CRP.15);
- (f) Conference room paper containing information received from Japan on national legislation relevant to the peaceful exploration and use of outer space (A/AC.105/C.2/2009/CRP.17);

- (g) Conference room paper containing information received from France on national legislation relevant to the peaceful exploration and use of outer space (A/AC.105/C.2/2009/CRP.18).
- 4. The Working Group also had before it the following information provided by Member States during the forty-seventh session of the Subcommittee:
- (a) Note by the Secretariat entitled "Information on national legislation relevant to the peaceful exploration and use of outer space", containing replies from the Czech Republic, Germany, Morocco, Nicaragua, Turkey and Ukraine (A/AC.105/912);
- (b) Conference room paper containing information received from the United States of America on national legislation relevant to the peaceful exploration and use of outer space (A/AC.105/C.2/2008/CRP.9);
- (c) Conference room paper containing information received from Brazil, Colombia, Germany and the Netherlands on national legislation relevant to the peaceful exploration and use of outer space (A/AC.105/C.2/2008/CRP.14).
- 5. In order to facilitate the work of the Working Group, the following documents were also made available:
- (a) Note by the Secretariat entitled "Review of existing national space legislation illustrating how States are implementing, as appropriate, their responsibilities to authorize and provide continuing supervision of non-governmental entities in outer space", containing a review of the national space legislation of Argentina, Australia, Japan, the Russian Federation, South Africa, Sweden, Ukraine, the United Kingdom of Great Britain and Northern Ireland and the United States of America (A/AC.105/C.2/L.224);
- (b) Report of the Secretariat entitled "Review of the concept of the 'launching State'", containing a synthesis of State practice in applying the concept of the "launching State", including the definition of "space activities"; jurisdiction over space activities; the safety of space activities; liability, including third-party insurance and financial responsibility requirements; indemnification procedures; and the registration of launches (A/AC.105/768).
- 6. The Working Group noted that national regulatory frameworks generally covered the following main areas: national jurisdiction for regulating space activities of governmental and non-governmental entities; procedures for authorizing and licensing national space activities; liability and indemnification procedures; registration of objects launched into outer space and establishment of national registries; and regulatory frameworks for national space agencies or other national entities mandated to carry out and supervise space activities.
- 7. The Working Group conducted a review of the following seven main issues for discussion:
 - (a) Reasons for States to enact national space legislation;
 - (b) Scope of space activities targeted by national regulatory frameworks;
 - (c) Scope of national jurisdiction over space activities;

- (d) Competence of national authorities in the authorization, registration and supervision of space activities;
 - (e) Conditions to be fulfilled for registration and authorization;
 - (f) Regulations concerning liability;
 - (g) Compliance and monitoring.
- 8. The Working Group noted that national regulatory frameworks represented different legal systems with either unified acts or a combination of national legal instruments, ranging from administrative regulations to decrees and laws; that States had adapted their national legal frameworks according to their specific needs and practical considerations; and that national legal requirements depended to a high degree on the range of space activities conducted and the level of involvement of the private sector.
- 9. In considering the reasons for States to enact national space legislation, the Working Group noted that common grounds for national legislation were the need to fulfil obligations under treaties to which a State had become a party, the need to achieve consistency and predictability in the conduct of space activities under the jurisdiction of the State and the need to provide a practical regulatory system for private sector involvement. The need for improved national coordination and the integration of a wider range of national activities had also provided incentive for regulatory frameworks at the national level.
- 10. With regard to the issue of the scope of space activities targeted by national regulatory frameworks, the Working Group noted a broad variety of activities, such as the launching of objects into outer space, the operation of a launch or re-entry site, the operation and guidance of space objects, in some cases the design and manufacturing of spacecraft, the application of space science and technology such as that used for Earth observation and telecommunications, and exploration activities and research.
- 11. In terms of the scope of national jurisdiction over space activities, the Working Group noted that most national regulatory regimes required authorization to be obtained for space activities carried out from the national territory. Most regimes also required authorization to be obtained for certain launches outside the national territory in which nationals were involved, such as citizens and non-governmental entities established or incorporated under the laws of the State in question. The Working Group noted that, with a view to balancing public and private interests, in some cases a more complex jurisdictional system was applied in order to regulate private sector involvement.
- 12. In considering the competence of national authorities in the authorization, registration and supervision of space activities, the Working Group noted that, in most States, there were different national authorities involved in those procedures, ranging from space agencies and other similar authorities up to ministerial-level authority, in some cases involving different governmental entities for different activities requiring a licence. The existence in some cases of separate procedures for the licensing of operators conducting space activities and for the authorization of specific projects and programmes was noted. The Working Group noted that there was a broad variety of means of registering space objects with a national registry,

including through a government ministry or through a space agency or similar authority.

- 13. With regard to the conditions to be fulfilled for registration and authorization, the Working Group noted that ensuring the safety of space activities was an important policy underpinning most national space laws, in particular laws governing the launch of objects into outer space. Most launch-licensing regimes included measures to ensure that the launch did not create a significant risk of personal injury, environmental damage or damage to property. Conditions concerning safety and technological standards were also closely linked to States' concern about meeting space debris mitigation requirements. Other conditions related to the professional and financial qualifications of the applicant. In addition, national security and foreign policy interests were usually involved in authorization and licensing procedures.
- 14. In terms of regulations concerning liability, the Working Group noted that the Convention on International Liability for Damage Caused by Space Objects^a contained a liability regime with no ceiling. However, several States had established ways of seeking recourse from operators, which was achieved in most cases by introducing a national liability regime for space operations, if necessary, in addition to general tort law or environmental liability. The Working Group noted the existence of a broad range of solutions for liability obligations and indemnification procedures, as well as insurance requirements.
- 15. In considering compliance and monitoring, the Working Group noted that most States applied procedures for the supervision and monitoring of licensed space activities, whether a system of in situ inspections or a more general reporting requirement for the fulfilment of obligations under a licence. Most national regulatory regimes operated with a set of administrative measures for minor violations and a sanctions regime, including penal sanctions in some cases, for more serious offences.
- 16. The Working Group agreed that the exchange of information provided an important basis for its work under the multi-year workplan and allowed it to continue examining the main developments taking place at the national level in order to identify common principles, norms and procedures.
- 17. The Working Group agreed that at its next session, in 2010, it should pursue its examination of the issues addressed during the current session. The Working Group also agreed that a number of issues needed further consideration, such as the regulation by States of transfers of ownership of space objects and of transfers of authorized space activities to third parties, the participation of private individuals in space flights and the treatment in service-provider contracts of issues of liability and responsibility for collisions of satellites in outer space.
- 18. The Working Group agreed that Member States should be invited to respond to the questions prepared by the Chairperson for the present session of the Working Group, and that that would provide an opportunity to complement the information available to the Working Group. Member States that had not yet enacted national space legislation should be invited to submit information on the reasons for the absence of such legislation.

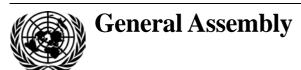
^a United Nations, Treaty Series, vol. 961, No. 13810.

- 19. The Working Group also agreed that the Secretariat, in consultation with the Chairperson, should prepare, for consideration by the Working Group at its next session, a paper providing a schematic overview of existing national regulatory frameworks based on information received from Member States.
- 20. Some delegations expressed the view that the findings of the Working Group should be summarized and synthesized in order to develop a better understanding of the manner in which States regulated space activities. Such information would be of assistance to Member States in drafting and developing their respective national space laws. It would also represent a valuable contribution to capacity-building in space law and be of particular interest to developing countries.
- 21. Some delegations expressed the view that that information could also provide a basis for the future harmonization of national space legislation.
- 22. Some delegations expressed the view that intersessional consultations among the Vienna-based permanent missions, including on the agenda item on national space legislation currently being considered by the Subcommittee, would enhance awareness of the work of the Committee on the Peaceful Uses of Outer Space.

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Reservations of the delegation of the Bolivarian Republic of Venezuela concerning the Safety Framework for Nuclear Power Source Applications in Outer Space

Note by the Secretariat

- 1. The Joint Expert Group of the Scientific and Technical Subcommittee and the International Atomic Energy Agency, established at the forty-fourth session of the Subcommittee to develop an international technically based framework of goals and recommendations for the safety of planned and currently foreseeable nuclear power source applications in outer space, carried out extensive work during 2007 and 2009. At the forty-sixth session of the Subcommittee, held in Vienna from 9 to 20 February 2009, the Joint Expert Group finalized the text of the draft Safety Framework for Nuclear Power Source Applications in Outer Space, for consideration by the Working Group on the Use of Nuclear Power Sources in Outer Space of the Subcommittee and by the Subcommittee.
- 2. At its 715th meeting, on 19 February, the Subcommittee adopted the Safety Framework for Nuclear Power Source Applications in Outer Space (AC.105/C.1/L.292/Rev.4. The Subcommittee noted the reservations expressed by the representative of the Bolivarian Republic of Venezuela with regard to the draft Safety Framework (A/AC.105/933, paras. 130-131).
- 3. Attached are the statements of the delegation of the Bolivarian Republic of Venezuela with regard to the Safety Framework for Nuclear Power Source Applications in Outer Space.

V.09-83244 (E) 150509 180509



Statement of the delegation of the Bolivarian Republic of Venezuela made during the adoption of the Safety Framework on 19 February*

[Original: Spanish]

With regard to this topic, the delegation of the Bolivarian Republic of Venezuela will not stand in the way of the consensus on approving the Safety Framework for Nuclear Power Source Applications in Outer Space. It wishes, however, to express its reservations concerning the terms and conditions submitted to the Subcommittee and the Working Group.

On this basis, it wishes to reiterate that, although the document makes no explicit reference to the uses of nuclear power sources in low-Earth orbits, it contains a number of ambiguous statements that leave open the possibility that this inadmissible practice will be retained in future space development programmes. The scope for discretion in decision-making in what is a matter of great delicacy should be addressed by the Subcommittee.

The second point that should be made is that responsibility before the peoples of the world lies *solely and entirely* with United Nations Member States; and that responsibility is not transferable.

Our delegation also views with concern the voluntary and non-binding nature assigned to the Safety Framework. The procedure for amending and establishing international standards to regulate the use of nuclear power sources in outer space will need to be promoted. To this end, the role of the Committee on the Peaceful Uses of Outer Space in promoting space law will need to be strengthened.

This statement will be submitted to the Secretariat, with an annex containing the comments made by this delegation concerning the Safety Framework.

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^{*} The present statement is reproduced in the form in which it was received.

Statement by the Bolivarian Republic of Venezuela at the forty-sixth session of the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space under agenda item 10: Use of nuclear power sources in outer space*

[Original: Spanish]

With regard to document A/AC.105/C.1/L.292/Rev.2,** dated 13 January 2009, the Venezuelan delegation wishes to thank the Joint Expert Group responsible for the draft text for the efforts that it made to address the comments submitted by our delegation through the regular channels established for that purpose. It is, however, a matter of concern that two basic problems remain in the document submitted for consideration by the Scientific and Technical Subcommittee at its forty-sixth session.

The first point to which this delegation would like to draw attention is that, despite the fact that great care was taken to make no explicit reference to the use of nuclear power sources in low-Earth orbits, there are numerous ambiguous statements that open up the possibility of retaining this inadmissible practice in future space development programmes. The scope for discretion in decision-making in what is a very delicate matter cannot be disregarded by the Subcommittee:

Preface

Second paragraph

"Reactors for power or propulsion are contemplated for scientific and exploration missions, for example to the Moon, Mars and other Solar System destinations, and for other missions requiring high power (e.g. communications, inter-orbital space tugs)..."

Comment: the reference to communications missions implicitly includes missions in low-Earth orbits.

Preface

Third paragraph

"...Potential accident conditions resulting from launch failures and **inadvertent** re-entry could expose NPS to extreme physical conditions..."

Comment: in cases of interstellar missions, inadvertent re-entry is not the most likely of situations. Inadvertency on whose part?

^{*} The present statement is reproduced in the form in which it was received.

^{**} The comments of the delegation of the Bolivarian Republic of Venezuela were made on the version of the Safety Framework contained in document A/AC.105/C.1/L.292/Rev.2 that, while being made available to the Subcommittee, had not yet been approved by the Joint Expert Group. At the same session of the Subcommittee the Secretariat published revision 3 of the Safety Framework, containing its final draft for consideration by the Working Group on the Use of Nuclear Power Sources in Outer Space of the Subcommittee and by the Subcommittee. The adopted version of the Safety Framework was made available in revision 4.

Preface

Seventh paragraph

"The focus of the Safety Framework is the protection of people and the environment in Earth's biosphere from potential hazards associated with relevant launch, operation and end-of-service mission phases of space NPS applications. ..."

Comment: the terms "operation" and "end-of-service mission" clearly allude to satellites in low-Earth orbits. In any case, it is necessary to limit satellites of this kind to those that already exist without permitting the proliferation of such satellites on future missions.

- 1. Introduction
- 1.1 Background

Second paragraph

"Reactors for power or propulsion are contemplated for scientific and exploration missions, for example to the Moon, Mars and other Solar System destinations, and for other missions requiring high power (e.g. communications, inter-orbital space tugs). Space NPS have enabled several ongoing missions. According to current knowledge and capabilities, space NPS are the only viable energy option to power some foreseeable space missions and significantly enhance others."

Comment: were the missions that were made possible thanks to the use of nuclear power in low-Earth orbits conducted in the interests of peace and the welfare of humankind?

The following statements reveal the discretionary nature of decision-making under the Safety Framework:

3. Guidance for governments

First paragraph

"Governmental responsibilities include establishing safety policies, requirements and processes; ensuring compliance with those policies, requirements and processes; ensuring that there is **acceptable justification** for using a space NPS when weighed against other alternatives"

Comment: who decides whether a justification is acceptable?

- 5. Technical guidance
- 5.2. Safety in design and development

"Design and development processes should provide the highest level of safety that can reasonably be achieved."

Comment: the highest level of safety that can reasonably be achieved?

The second point that the delegation of the Bolivarian Republic of Venezuela wishes to make is that responsibility before the peoples of the world lies *solely and entirely* with the United Nations Member States and that that responsibility is non-transferable. The document under consideration contains statements of an unacceptable ambiguity, with a marked privatizing tendency that is not admissible for the Subcommittee:

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2. Safety objective

First paragraph:

"Governments, international intergovernmental organizations and non-governmental entities responsible for authorizing, approving or conducting space NPS applications should take measures to ensure that people (individually and collectively) and the environment in Earth's biosphere are protected without unduly limiting the uses of space NPS applications."

Comment: this opens up the possibility that non-governmental entities might be in a position to give approval.

"without unduly limiting...": who assumes the right to decide what is a "due" limitation?

Second paragraph

"Guidance for achieving the fundamental safety objective is grouped into three categories: guidance for governments (section 3 below) applies to governments and relevant international intergovernmental organizations responsible for authorizing, approving or conducting space NPS missions; guidance for management (section 4 below) applies to the management of the organization that conducts space NPS missions; and technical guidance (section 5 below) applies to the design, development and mission phases of space NPS applications."

Glossary of terms

"Organization that conducts the space nuclear power mission: the legal entity that has the direct control and oversight of a space nuclear power mission"

Comment: the texts cited above explicitly establish that the intention is to entrust authorization, execution, direct control and supervision to the private sector.

4. Guidance for management

"This section provides guidance for management of the organizations involved in space NPS missions. In the context of the Safety Framework, management should comply with governmental and relevant intergovernmental safety policies, requirements and processes to achieve the fundamental safety objective. Management responsibilities include accepting prime responsibility for safety, ensuring the availability of adequate resources for safety and promoting and sustaining a robust 'safety culture' within the organization."

Comment: responsibility before the peoples of the world lies with governments. The statement quoted above runs counter to the principles of the United Nations. The proposed shift of responsibilities is reaffirmed in:

4. Guidance for management

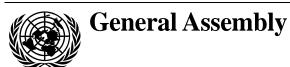
4.1. Responsibility for safety

"The prime responsibility for safety should rest with the organization that conducts the space nuclear power source mission.

"The organization that conducts the space NPS mission has the prime responsibility for safety. ..."

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United Nations A/64/138



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Sixty-fourth session Item 95 (v) of the preliminary list* General and complete disarmament

Transparency and confidence-building measures in outer space activities

Report of the Secretary-General

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^{*} A/64/50.





I. Introduction

- 1. In paragraph 2 of its resolution 63/68, on transparency and confidence-building measures in outer space activities, the General Assembly invited all Member States to submit to the Secretary-General concrete proposals on international outer space transparency and confidence-building measures in the interest of maintaining international peace and security and promoting international cooperation and the prevention of an arms race in outer space.
- 2. On 11 February 2009, a note verbale was sent to all Member States drawing their attention to paragraph 2 of resolution 63/68 and seeking relevant information on the issues outlined above. The replies received from Argentina, Colombia, Cuba, Czech Republic (on behalf of the States Members of the United Nations that are members of the European Union), Lebanon, Mexico, Nicaragua, Qatar, Syria and Ukraine are reproduced in section II below. Additional replies received will be issued as addenda to the present report.

II. Replies received from Governments

Argentina

[Original: Spanish] [28 May 2009]

- 1. General Assembly resolution 63/68 on transparency and confidence-building measures in outer space activities invited Member States to submit concrete proposals on international outer space transparency and confidence-building measures in the interest of maintaining international peace and security and promoting international cooperation and the prevention of an arms race in outer space.
- 2. The preliminary comments of the Argentine Republic in the matter are as follows:
- (a) The Argentine Republic is of the view that the legal system has proven incapable of averting the danger of the militarization of outer space;
- (b) It believes that, as a first step, progress must be made in adopting transparency and confidence-building measures as a significant contribution to creating an atmosphere of understanding and cooperation that will help prevent an arms race in outer space;
- (c) The process of updating the principles of satellite-based remote sensing of the Earth should begin. The existing principles, which were adopted by a resolution of the General Assembly in 1986, are no longer suited to the present situation. It should be noted, in particular, that those principles contain provisions that do not give developing countries access to the information gathered. Part of the updating process could be to consider establishing the programme of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response, which was considered by the Committee on the Peaceful Uses of Outer Space;

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- (d) Furthermore, it would be advisable for negotiations to be undertaken in the Conference on Disarmament the sole multilateral disarmament negotiating forum on an international legal instrument banning the deployment of weapons in outer space. Such an instrument would have substantial scope and significance as the outcome of negotiations between the parties; furthermore, its adoption would confirm the will of the international community to avoid an arms race in outer space. Argentina supports the proposal by the Russian Federation and the People's Republic of China to negotiate, in the Conference on Disarmament, a treaty on a space weapons ban;
- (e) Establishment of unilateral, bilateral, regional and global mechanisms for the provision of information in order to give transparency to space programmes being carried out by States. This could include inviting observers to launches of space objects, demonstrating space technologies and rockets, notification of space vehicle launches and manoeuvres, etc.;
- (f) To that end, the General Assembly could set up a Group of Governmental Experts on outer space confidence-building measures to establish the scope, focus and terms of reference for the establishment under the United Nations of a mechanism, system or unified voluntary registry of space activities, including notifications. The Group's work could be based on the relevant existing treaties, codes, principles and global or regional initiatives including, for example, the mechanism for annual reporting under the Hague Code of Conduct on the launching of ballistic missiles and space launch vehicles.

Colombia

[Original: Spanish] [29 May 2009]

Statement of problem

- 1. Currently, the activities that can take place in outer space help to improve the quality of human life through the establishment of operational communications, weather forecasting, disaster early warning, environmental monitoring, distance education and global navigation satellite systems, among other things.
- 2. The United Nations promotes the creation of regulatory mechanisms to ensure that all of those activities are carried out solely for peaceful purposes "by all countries regardless of their degree of economic or scientific development, without detriment to the security of any State, and in keeping with the spirit, intent and purpose of the treaty containing the principles governing activities involving the uses of outer space".
- 3. The General Assembly created the Committee on the Peaceful Uses of Outer Space, which comprises 61 Member States and coordinates the activities of the United Nations in that area.
- 4. Nevertheless, the international community is concerned about outer space activities that may involve the deployment of military systems, which could unleash an arms race, and the use of nuclear power sources in outer space. This situation is a reality because the legal system that applies to outer space is insufficient to guarantee its non-militarization.

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5. These activities have undermined confidence in matters of outer space and are conducive to an arms race in space. That being the case, the consequences for the safety of the human race could be incalculable, since development and the free exploration and peaceful use of space may be affected.

Proposals on outer space confidence-building activities

- 6. As a consequence of the foregoing, international outer space transparency and confidence-building measures are necessary to ensure peace of mind for the international community. We therefore propose:
- (a) Developing a mechanism whereby States periodically submit reports on the activities they are undertaking in outer space and the reasons for them;
- (b) Creating a mechanism whereby States' activities in outer space can be verified:
- (c) Finally, it is important to consider creating, with the help of international cooperation, a specially designed system for the detection and management of space debris.

Cuba

[Original: Spanish] [2 July 2009]

- 1. The General Assembly, by its resolution 63/68, invited all Member States to continue to submit to the Secretary-General concrete proposals on international outer space transparency and confidence-building measures in the interest of maintaining international peace and security and promoting international cooperation and the prevention of an arms race in outer space. In response to this invitation, the Government of Cuba wishes to convey the following considerations.
- 2. It was quite some time ago that the prevention of an arms race in outer space gave way to expressions of global concern about the grave danger to international peace and security that such an arms race would represent. As a consequence, the international community has established a number of legal instruments for that purpose, including the Partial Test Ban Treaty (1963), the Treaty on Peaceful Uses of Outer Space (1967) and the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (1979).
- 3. Those instruments have played a positive role in promoting the peaceful use of outer space and in regulating space activities. They have also been important in prohibiting the deployment of weapons of mass destruction and certain military activities in outer space.
- 4. Cuba supports the efforts being made in that respect by the General Assembly and the Conference on Disarmament, in particular the negotiation in the Conference of an international legal instrument banning the deployment of weapons in outer space, and to that end it favours the urgent establishment of a special committee to start the negotiations. General Assembly resolution 63/68 is a very important contribution to the efforts to prevent an arms race in outer space.

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- 5. At the recent Ministerial Meeting of the Coordinating Bureau of the Non-Aligned Countries held in Havana in April 2009, Heads of State or Government expressed their concern about the negative consequences of developing and deploying anti-ballistic missile defence systems and seeking advanced military technologies that can be deployed in outer space, which could unleash an arms race and lead to the development of advanced missile systems and the proliferation of nuclear weapons.
- 6. Current international events are demonstrating, however, that these treaties are no longer enough to prevent the deployment of weapons in space. Unfortunately, a considerable number of objects now located in outer space are not intended to solve the problems of humankind but are instead being used for military or espionage purposes and are adding to the generation of space debris. This is one of the main problems we are currently facing in outer space.
- 7. Last year, we witnessed the official submission to the Conference on Disarmament, in Geneva, of a joint initiative by the Governments of the Russian Federation and the People's Republic of China consisting of a draft treaty for a ban on weapons in outer space. This initiative, which has gained the support of various countries, seeks to ban not only space-based arms development, but also the use of force against satellites or any other type of space object.
- 8. Cuba reiterates that this is a concrete measure in the interest of maintaining international peace and security in outer space activities whose realization will require the support of the international community. Nevertheless, it is opposed by countries such as the United States of America, which has not given up plans for its anti-missile shield programme, which includes elements ranging from laser cannon to anti-satellite missiles.
- 9. Transparency and confidence-building measures are no substitute for arms control and disarmament measures, nor are they a precondition for implementation of the latter. Nonetheless, they can facilitate the implementation of disarmament agreements and arms verification. Measures could include:
 - Convening an international conference to analyse strict compliance with existing agreements on the peaceful uses of outer space
 - A review of the current legal system governing activities in outer space in the light of technological advances, which has been permanently blocked by some States in the Legal Subcommittee of the Committee on the Peaceful Uses of Outer Space
 - Adoption of multilateral agreements for the exchange of information related to the use of outer space
 - Development of international cooperation mechanisms that guarantee all countries equal access to the benefits of the peaceful uses of outer space
 - Exchange of information on States' main policy directions on outer space, major space research programmes and programmes for the use of outer space, and the orbital parameters of space objects
 - Inviting observers to launches of space objects, on a voluntary basis
 - Demonstration of space technologies and rockets

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- Notification of scheduled launches of space vehicles, planned space manoeuvres that may come dangerously close to the space vehicles of other States and the re-entry of guided space vehicles from orbit into the atmosphere
- Consultations to clarify information provided on research programmes and programmes for the use of outer space, on ambiguous situations and on other matters of concern and to examine the implementation of the transparency and confidence-building measures agreed upon for space-based activities
- 10. With respect to the use of nuclear power sources in outer space, which is also a matter of international concern, Cuba believes that until the safety framework is sufficiently clear and progress has been made towards more concrete agreements in that respect, this activity should be restricted as far as possible. This limited use should be accompanied by full and transparent information to other States explaining what measures have been taken to guarantee safety.
- 11. Transparency and confidence-building measures can play an important role in the drafting, approval and implementation of a new treaty banning the deployment of weapons in outer space and the use or threat of force against space objects. They will also help create favourable conditions for the conclusion of a new agreement.

Czech Republic (on behalf of the States Members of the United Nations that are members of the European Union)

[Original: English] [28 May 2009]

Introductory note

- 1. The European Union considers that in the context of expanding space activities that contribute to the development of nations, it is important to improve their security and the security of objects in space. The European Union continues to attach great importance to this issue and is committed to the development and implementation of transparency and confidence-building measures for the peaceful and secure use of outer space. The unprecedented collision between two satellites that occurred in the beginning of February 2009 clearly proved the usefulness of the pragmatic and concrete approach adopted by the European Union.
- 2. The European Union attaches great importance to the relevant existing agreements on outer space activities, which already provide a wide range of transparency and confidence-building measures, and sees them as the basis on which we should build upon.
- 3. The European Union voted in favour of General Assembly resolutions 61/75, 62/43 and 63/68 on transparency and confidence-building measures in outer space activities. The broad support garnered by these resolutions confirmed the importance of establishing a voluntary regime encompassing transparency and confidence-building measures based, inter alia, on the following principles:
 - (a) Freedom for all to use outer space for peaceful purposes;
 - (b) Preservation of the security and integrity of space objects in orbit;

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- (c) Due consideration for the legitimate security and defence interests of States.
- 4. The European Union also recognizes the work of the United Nations Committee on the Peaceful Uses of Outer Space. The Space Debris Mitigation Guidelines endorsed by the Committee in June 2007 and by the General Assembly in its resolution 62/217 are useful contributions to the preservation of the space environment. They are fully conformable with the aims of the European Union plan for a code of conduct for outer space activities.
- 5. The European Union also supports the initiative aimed at guaranteeing the long-term sustainability of space activities presented to the United Nations Committee on the Peaceful Uses of Outer Space as a proposed new agenda item. The continued involvement of numerous States as well as commercial operators and relevant international organizations reflects the interest in and importance that they attach to the search for concrete measures to strengthen the security of outer space activities. This initiative is fully consistent with and complementary to the European Union plan for a draft code of conduct for outer space activities. The European Union supports that, at the June 2009 main Committee meeting, the long-term sustainability of space activities be formally added to the 2010 agenda of the Committee's Scientific and Technical Subcommittee.
- 6. In the European context, a European code of conduct for space debris mitigation was adopted in 2004, aimed at reducing the generation of debris in outer space. Furthermore, the European Union adopted the European Space Policy, which is aimed at developing better coordination among the European Union, the European Space Agency and their member States.

Draft code of conduct for outer space activities

- 7. Following the joint reply to resolution 61/75, in which the European Union expressed its intention to propose a code of conduct on space objects and space activities, the European Union developed, at the expert level, a draft code of conduct for outer space activities, which was supported by the Council of the European Union on 8 and 9 December 2008.
- 8. The European Union believes that a voluntary code of conduct, which is not legally binding, will strengthen safety, security and predictability of activities in outer space, among other things by limiting or minimizing harmful interference, collisions or accidents in outer space.
- 9. The draft code of conduct for outer space activities is based on the three main principles mentioned above (see para. 3) that should guide space activities.
- 10. The draft code of conduct is applicable to all outer space activities conducted by States or non-governmental entities, including the activities carried out within the framework of international intergovernmental organizations. It covers civil as well as military outer space activities.
- 11. The draft code of conduct calls for progress towards adherence to, and implementation of, the existing United Nations treaties, principles and other arrangements, as the subscribing parties would commit to complying with them, to making progress towards adherence to them, to implementing them, and to promoting their universality.

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- 12. The draft code of conduct complements the existing framework by codifying new and innovative best practices in space operations, including notification, consultation, investigation and information mechanisms that would strengthen the confidence and transparency between space actors; it will then contribute to developing good faith solutions that would permit the performance of space activities and access to space for all. According to the draft code, the subscribing States will implement, inter alia, the following confidence-building measures:
- (a) In order to minimize the possibility of accidents in space, collisions between space objects or any form of harmful interference with other States' right to the peaceful exploration and use of outer space, the subscribing States will establish and implement national policies and procedures and will take appropriate steps to minimize the mentioned risks;
- (b) In order to limit the creation of space debris and reduce its impact in outer space, the subscribing States will implement the Space Debris Mitigation Guidelines of the Committee for the Peaceful Uses of Outer Space endorsed by General Assembly resolution 62/217;
- (c) In order to prevent accidents and collisions between space objects, the subscribing States will share information on national space policies on an annual basis. They will commit to notifying in a timely manner, the scheduled manoeuvres; relevant orbital parameters; collisions or accidents; and objects with significant risk of re-entry into the atmosphere or of orbital collision. They will also create a central point of contact and an electronic database;
- (d) Moreover, the subscribing States will create a consultation mechanism to achieve acceptable solutions in case of existing reasons to believe that certain space activities are contrary to the purpose of the draft code.
- 13. The code of conduct will lay down the basic rules to be observed by spacefaring nations in both civil and military space activities; however, it does not include any provisions concerning the placement of weapons in outer space. The purpose of the draft code is not to duplicate or compete with initiatives already dealing with this issue. Nonetheless, as a transparency and confidence-building instrument, the draft does insist, inter alia, on the importance of taking all measures in order to prevent space from becoming an area of conflict and calls on nations to resolve any conflict in outer space by peaceful means.

Participation in the code of conduct for outer space activities

- 14. The aim of the authors is to reach soon a text that is acceptable to the greatest number of countries and can thus bring effective security benefits in a relatively short term. For this purpose, the European Union launched consultations with the countries, which have activities or interests in outer space.
- 15. At the end of the aforesaid process, the European Union hopes to complete the development of the code of conduct that will be open for accession by all States on a voluntary basis at an ad hoc conference.

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Lebanon

[Original: Arabic] [31 March 2009]

The Ministry of Defence notes that Lebanon does not engage in any activities in outer space and affirms the following:

- World peace must be preserved in space and the occurrence of any arms race or "star wars" prevented;
- International cooperation and mutual understanding must be strengthened in compliance with the Declaration on Principles of International Law;
- The Secretary-General of the United Nations must be notified by the States parties of any phenomenon they may discover in outer space that endangers human life or health;
- The necessary legislation and strict deterrent regulations must be established to prevent the exploitation and utilization of outer space and an arms race;
- There must be greater transparency, and acknowledgement of the importance of confidence-building measures as a means of ensuring the attainment of the objective of preventing armament in outer space and the establishment of bases or installations therein;
- Missile and nuclear activities in space should be monitored in order to avert the dangers arising from such activities, which are a threat to peace and security.

Mexico

[Original: Spanish] [31 March 2009]

- 1. Mexico considers that protecting the infrastructure of space-based assets is a priority, and towards that end it is essential to avert a major accident in outer space. One way of preserving outer space for exclusively peaceful purposes is to strengthen international cooperation, in particular with respect to the safety and protection of space assets. In this regard and in accordance with Mexico's commitment to maintain the peaceful and universal character of outer space, our country is promoting greater transparency in the activities carried out in this area by the different States, in particular with reference to the Latin America and Caribbean region.
- 2. Mexico has participated actively in the five Space Conferences of the Americas and contributes to the implementation of the measures identified in their plans of action. At the present time it is considering the possibility of hosting the sixth Space Conference of the Americas, as it considers participation in such forums important because, among other reasons, the United Nations General Assembly has urged the Committee on the Peaceful Uses of Outer Space to continue studying ways and means of fostering regional and interregional cooperation.

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- 3. In the legal sphere, Mexico's aim is for the universal application of the provisions contained in United Nations treaties relating to outer space to help promote international cooperation in the peaceful uses of outer space and foster greater transparency and confidence in space activities. Mexico considers that the implementation of voluntary guidelines on the reduction of space debris at the national level would lead to greater mutual understanding with respect to space activities and thereby would increase stability in space and reduce the likelihood of friction and conflicts. In Mexico's view, it is essential that States that have not yet ratified or acceded to these treaties should consider the possibility of doing so.
- 4. In short, Mexico supports access by all States to the benefits of the peaceful use of science and space technology through international cooperation, including training and education for personnel and participation in international projects entailing the transfer of technology.

Nicaragua

[Original: Spanish] [11 March 2009]

- 1. Nicaragua recognizes the interest and right of all States with respect to the exploration and utilization of outer space for peaceful purposes. However, given the current state of international law and in the light of recent events, there is a need to strengthen the implementation of the existing instruments in order to prevent an arms race in outer space, which would have serious consequences for international peace and security. In addition, as stated in the Final Document of the 2006 Summit Conference of the Non-Aligned Movement, held in Havana, there is an urgent need for the commencement of substantive work in the Conference on Disarmament on the prevention of an arms race in outer space.
- 2. There is a need to ensure that Member States that carry out significant peaceful scientific activities in outer space should share their experience with States that do not have space programmes through a specific mechanism for this purpose covering existing and future space programmes.
- 3. Outer space affairs are handled by the Nicaraguan Civil Aeronautics Institute (INAC), a body of the Ministry of Transport and Infrastructure of the Government of Nicaragua. Nicaragua's primary interest has been and continues to be to benefit from access to satellite technology for use in aviation communications, meteorology and geographical information systems such as the global positioning system (GPS). Nicaragua has access to these systems through institutions that cooperate with it, such as the Central American Corporation for Air Navigation Services (COCESNA), the International Civil Aviation Organization (ICAO) in the field of aviation, and the World Meteorological Organization (WMO) in the field of meteorology.
- 4. It is keen to participate actively in international forums to promote greater development and understanding of the peaceful uses of outer space. Its policy favours developing these means for scientific and peaceful purposes.
- 5. Nicaragua shares the concern of the international community over possible accidents or safety failures connected with the use of nuclear power sources in outer space that have been developed for and installed on spacecraft, precisely in those cases where the specific requirements of the mission and limitations with respect to

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electric power and thermal management rule out the use of non-nuclear power sources.

6. Nicaragua takes the view that close attention must be paid to these matters owing to the presence of radioactive or combustible nuclear materials in nuclear power sources used in outer space and the possibility that they can cause harm to persons or the environment of the Earth's biosphere should an accident occur. We believe that safety must always be an intrinsic element in the design and use of this kind of technology. It is important to take into account that safety, that is to say the protection of persons and the environment, must be an integral part of research in this field.

Qatar

[Original: Arabic] [14 April 2009]

The State of Qatar affirms the need for transparency in activities in outer space. Such activities should be restricted to peaceful uses for the benefit of mankind and the militarization of outer space or its use for military or missile-related activities should be avoided. We also support the development of a unified definition of outer space, the entry into force of a treaty on the prevention of an arms race in outer space, and guarantees of the right of States to conduct peaceful scientific research related to outer space.

Syrian Arab Republic

[Original: Arabic] [9 March 2009]

- 1. The Syrian Arab Republic considers that outer space is the heritage of all mankind and must be used for peaceful purposes and for the benefit of all States.
- 2. The Syrian Arab Republic emphasizes that the increased importance of outer space, particularly in the field of communications and data exchange at the cosmic level, requires cooperation between all States in order to ensure the continued peaceful and fully transparent utilization of space. The Syrian Arab Republic also emphasizes the necessity of taking measures to ensure confidence-building and the exchange of data between all States, particularly those States that engage in space activities.
- 3. The Syrian Arab Republic considers that those States that have capabilities in outer space bear a responsibility to ensure its peaceful and non-military utilization, to refrain from engaging in an arms race in outer space and to keep it free of all kinds of weapons of mass destruction.
- 4. The Syrian Arab Republic expresses its support for the establishment of a subsidiary body of the Conference on Disarmament as the only multilateral negotiating forum in the field of disarmament to hold negotiations on a convention to prevent an arms race in outer space as part of a comprehensive and balanced programme of work dealing, on an equal footing, with the substantive issues on its agenda.

5. In this connection, the Syrian Arab Republic expresses its support for the joint Russian-Chinese initiative on a draft treaty prohibiting an arms race, the stockpiling of weapons in outer space and the threat of force against targets in outer space that was submitted to the Conference on Disarmament on 12 February 2008.

Ukraine

[Original: Russian] [10 April 2009]

- 1. Ukraine, as a space Power, is interested in keeping outer space free from weapons and military activities. Outer space is the heritage of all humanity and should therefore be used for peaceful purposes. Our Government has consistently advocated the prevention of the militarization of outer space and opposed the placement of any weapons of mass destruction in outer space.
- 2. The root of the problem with regard to military security in outer space is the fact that international space law prohibits only the placement in orbit of weapons of mass destruction and nuclear weapon tests in the atmosphere. It does not prohibit the use of outer space for military purposes or the use in outer space of weapons other than weapons of mass destruction. However, the placement of weapons in outer space will have negative consequences for arms control and will essentially lead to armed conflict in outer space itself. In the opinion of Ukraine, the time has come for a complete prohibition on the placement and use of any kind of weapon in outer space, which is the common heritage of mankind. We agree that the most effective way to resolve this issue is to draft a new treaty that would fill the existing gaps in international space law.
- 3. Ukraine supports the initiative of the Russian Federation and China for the conclusion of a treaty on prevention of the placement of weapons in outer space and the threat or use of force against outer space objects.
- 4. Ukraine, as a country with significant capacities for conducting outer space programmes, has consistently and rigorously adhered to the international legal principles regulating outer space activities.
- 5. Ukraine supports the view that transparency and confidence-building measures in outer space activities help to create an environment conducive to resolving international problems, and improving and developing international relations on the basis of cooperation, while facilitating the management of situations that could lead to international tension. Transparency and confidence-building measures as such reduce the risk of a mistaken perception or assessment of another State's military activity, while contributing to the prevention of military confrontation and the application on that basis of the principle of the non-use of force or of the threat of force, and the strengthening of regional and global stability.
- 6. Ukraine is convinced that broad international cooperation on the exploration of outer space builds mutual confidence between States and contributes to the development of their cooperation in all areas of international life. Ukraine also holds the view that one of the ways to achieve the goal of identifying concrete measures for transparency and confidence-building in outer space is international cooperation based on the exchange of information and data. The Government of

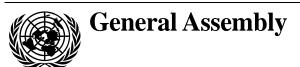
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Ukraine implements the following transparency and confidence-building measures in relation to outer space activities:

- Reports to the Secretary-General each year on the nature, progress and results of its outer space activities
- Systematically provides data on space objects that have been launched and space objects that are no longer in orbit
- Provides information to the international community on a regular basis through the official website of the National Space Agency of Ukraine on the number, generic class and payload of Ukrainian space launch vehicles launched
- Provides the Executive Secretariat of the International Code of Conduct against Ballistic Missile Proliferation with prior notifications on a regular basis of launches of Ukrainian launch vehicles in the context of the Sea Launch programme and annual statements on Ukraine's policies regarding the launching of outer space launch vehicles and ballistic missiles
- 7. Ukraine believes that States should strictly comply with the provisions of international treaties to which they are parties, namely:
 - The basic United Nations treaties on outer space (particularly taking account of the provisions of article IV of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, of 27 January 1967, and article IV of the Convention on Registration of Objects Launched into Outer Space of 14 January 1975)
 - The Comprehensive Nuclear-Test-Ban Treaty of 24 September 1996
 - The Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water of 5 August 1963
- 8. Ukraine supports the initiative for a European code of conduct for outer space activities.
- 9. In addition, Ukraine proposes that the information from the annual declarations providing an outline of the policies of the States subscribing to the Hague Code of Conduct with respect to launch programmes for ballistic missiles and space launch vehicles be used to draw up an annual consolidated report by the Secretary-General.
- 10. Ukraine supports the view that the work on transparency and confidence-building measures in outer space activities (as in the context of the Conference on Disarmament and the First Committee of the General Assembly) may be an important consolidating factor in relation to outer space, and also lead to specific results:
 - A careful and responsible approach to the exploration and use of outer space
 - The achievement of strategic stability and international security
 - The strengthening of a climate of confidence and cooperation in outer space activities.

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Item 96 (v) of the provisional agenda* General and complete disarmament

Transparency and confidence-building measures in outer space activities

Report of the Secretary-General

Addendum**

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^{**} The information contained in the addendum was received after the submission of the main report.





^{*} A/64/150.

Canada

[Original: English] [27 August 2009]

- 1. Outer space plays an essential role in all aspects of our everyday life and is becoming increasingly important for our national and economic security. Canada is committed to the maintenance of international peace and security in outer space in order to ensure that outer space remains free for exploration and use, for the benefit and the interest of all countries.
- 2. Physical conflict in outer space should be prohibited if nations want to continue to benefit from the peaceful uses of space. Any physical conflict that can cause damage or destruction has the potential to create long-lived space debris or derelicts, whose subsequent collisions may create additional space debris and pose a threat to vital State assets, which may be critical for national security. Economic and scientific assets, which are of significant importance to global economic growth and scientific understanding, may also be compromised.
- 3. A possible transparency and confidence-building measure could be for nations to pledge:
 - (a) To ban the placement of weapons in outer space;
- (b) To prohibit the testing and use of weapons on satellites so as to damage or destroy them; and
 - (c) To prohibit the use of satellites themselves as weapons.
- 4. This pledge would follow the 13 June 2006 statement by Mr. John Mohanco, Deputy Director of the Office of Multilateral Nuclear and Security Affairs of the United States State Department, at the Conference on Disarmament stating that the United States has no plans to build space weapons. ¹
- 5. This pledge would also follow the 8 June 2006 statement by Ms. Fiona Paterson, Deputy Permanent Representative of the United Kingdom of Great Britain and Northern Ireland to the Conference on Disarmament, at the Conference on Disarmament reiterating that the United Kingdom has no plans to deploy weapons in space.²
- 6. This pledge would further follow the 1 February 2005 statement by Ambassador Leonid Skotnikov of the Russian Federation to the Conference on Disarmament articulating that Russia would not be the first nation to place a weapon in outer space.³
- 7. The international community has the opportunity to preserve outer space for peaceful purposes through a prohibition on physical conflict in outer space, prior to hostilities ever erupting in this domain. Canada therefore calls upon all nations to initiate the process to achieve this aim by announcing their respective pledges in an appropriate forum.

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¹ CD/PV.1025.

² CD/PV.1024.

³ CD/PV.970.

8. In a statement by Ambassador Marius Grinius on 26 March 2009, Canada put forward the proposal that such security guarantees developed within the Conference on Disarmament could become a foundation for appropriate legal protections.⁴

China

[Original: Chinese and English] [19 September 2009]

- 1. China supports resolution 63/68 adopted by the General Assembly at its sixty-third session. Detailed ideas and relevant proposals on transparency and confidence-building measures in outer space activities have been reflected in the joint working paper submitted to the Conference on Disarmament by China and the Russian Federation in 2006 as contained in document CD/1778.
- 2. China is of the view that appropriate transparency and confidence-building measures in outer space are conducive to reducing possible misunderstandings among countries with regard to their respective activities in outer space, increasing mutual trust, facilitating international cooperation on peaceful uses of outer space and, to some degree, are helpful to guaranteeing the security of outer space activities and realizing the goal of prevention of an arms race in outer space. In fact, commitment to refrain from placing weapons in outer space and to prevent the weaponization of and an arms race in outer space per se would be one of the most important transparency and confidence-building measures in outer space activities. However, transparency and confidence-building measures are not legally binding, thus cannot plug the loopholes in existing international legal instruments. These measures can be complementary to a negotiated international legal instrument on preventing the weaponization of and an arms race in outer space, but cannot replace the legal instrument.
- 3. China believes that the best way to prevent the weaponization of and an arms race in outer space is to conclude a new international legal instrument through negotiation. In recent years, China, together with the Russian Federation and many other countries, has been actively promoting in the Conference on Disarmament the negotiation and conclusion of an international legal instrument on preventing the weaponization of and an arms race in outer space. In February 2008, China and the Russian Federation jointly submitted to the Conference on Disarmament a draft treaty on the prevention of the placement of weapons in outer space, and the threat or use of force against outer space objects, which has been welcomed by the majority of the members of the Conference on Disarmament. China hopes that the Conference on Disarmament will start substantive work and formal negotiation on the draft treaty as soon as possible.
- 4. China will continue to make joint efforts with all countries to actively promote the prevention of weaponization of and an arms race in outer space and to commit itself to maintaining peace and security in outer space.

^{4 &}quot;Statement by Canada in the CD On Tabling of Canada's Working Paper on TCBMs for Space Security", Ambassador Marius Grinius, 26 March 2009, http://www.unog.ch/80256EDD006B8954/ (httpAssets)/354F156CA8A8D44FC1257585003D51EF/\$file/1134_Canada_Space_E.pdf (accessed 6 July 2009).

Russian Federation

[Original: Russian] [13 July 2009]

- 1. The Russian Federation considers that confidence-building measures help to ensure peace, security and stability at all levels, to eliminate possible threats and overcome challenges to peace and security, and to prevent military confrontation, while facilitating the management of situations that could lead to international tension. They make a significant contribution to improving inter-State relations and the development of dialogue and cooperation between countries.
- 2. Transparency and confidence-building measures in outer space activities, in view of the growing dependence of all countries in the world on the outcome of such activities, are an important component of confidence-building measures, which also include measures on land, at sea and in the air, and are intended to achieve similar aims. They are recognized as helping to prevent the emergence of outer space as a new sphere of confrontation, to avoid a new nuclear arms race and to establish conditions for the predictability of the strategic situation in outer space, the security of space activities and the protection of space assets. These measures may become a significant field for broad multilateral cooperation.
- 3. A number of transparency and confidence-building measures in outer space activities are already included in international agreements on outer space: the 1967 Outer Space Treaty, the 1968 Astronauts Rescue Agreement, the 1972 Liability Convention and the 1975 Registration Convention. Some of these measures are applied by States as a unilateral initiative and are political obligations.
- 4. Transparency and confidence-building measures are not, however, allembracing in terms either of their coverage of the various types of outer space activity or of the participation of States in their implementation. Joint work is needed on additional measures in this area that are appropriate to the current stage of development of humanity.
- 5. In this work it would be useful to consider the results of the study on the application of confidence-building measures in outer space that was conducted by a group of governmental experts over the period 1990-1993 (it is included in the report by the Secretary-General contained in document A/48/305) and also other related proposals introduced by States, including some proposals in connection with General Assembly resolution 61/75.
- 6. In order to conduct a more in-depth study of issues relating to transparency and confidence-building measures and prepare recommendations for further work in this area, it would be useful to establish a group of governmental experts with the appropriate mandate.
- 7. The Russian Federation draws the attention of the international community to a number of unfortunate incidents that have occurred in the course of outer space activities: the collision between Russian Federation and United States space satellites on 10 February 2009, and the dangerous proximity of a number of space objects and pieces of space debris to the International Space Station. These incidents illustrate the importance of addressing the issue of foreseeing and providing early warnings of dangerous incidents in outer space.

The Russian Federation is making the following addition to its previous suggestions for possible transparency and confidence-building measures: the exchange of information on foreseeable dangerous situations in outer space. The aim of such a measure would be to prevent or minimize the consequences of dangerous incidents in outer space. Its implementation would consist of providing information to interested countries and international space organizations on the situation in outer space, on possible dangerous incidents that are forecast for a specific time period, such as the proximity and collision of space objects, or the uncontrolled movement out of orbit or planned manoeuvres of space objects. Such information would be provided through an appropriate exchange mechanism, in an agreed volume and format, and would be corrected as a matter of urgency when necessary.

- 8. Additional proposals of the Russian Federation in relation to possible transparency and confidence-building measures which are both relevant and forward-looking are set out below. This list is not exhaustive in nature but could, in our opinion, serve as a basis for further discussion.
- 9. Possible transparency and confidence-building measures fall into several categories:
 - Measures aimed at enhancing the transparency of outer space programmes;
 - Measures aimed at expanding the information available on outer space objects in orbit:
 - Measures related to the rules of conduct for outer space activities.
- 10. Such measures may be carried out in various ways, including exchange of information, familiarization visits, notifications, consultations and thematic workshops:
 - (a) Exchange of information on:
 - (i) The main directions of States' outer space policy;
 - (ii) Major outer space research and use programmes;
 - (iii) Orbital parameters of outer space objects;
 - (iv) Foreseeable dangerous situations in outer space;
 - (b) Familiarization visits:
 - (i) Expert visits, including visits to space launch sites, flight command and control centres and other outer space infrastructure facilities;
 - (ii) Invitation of observers to launches of spacecraft;
 - (iii) Demonstrations of rocket and space technologies;
 - (c) Notification of:
 - (i) Planned spacecraft launches;
 - (ii) Scheduled spacecraft manoeuvres which could result in dangerous proximity to spacecraft of other States;
 - (iii) The beginning of descent from orbit of unguided space objects and the predicted impact areas on Earth;

- (iv) The return from orbit into the atmosphere of a guided spacecraft;
- (v) The return of spacecraft with a nuclear power source on board, in the case of malfunction and danger of radioactive materials descending to Earth;
- (d) Consultations:
- (i) To clarify the information provided on outer space research and use programmes;
- (ii) On ambiguous situations, as well as on other issues of concern;
- (iii) To discuss the implementation of agreed transparency and confidence-building measures in outer space activities;
- (e) Thematic workshops on various outer space research and use issues, organized on a bilateral or multilateral basis, with the participation of scientists, diplomats, military and technical experts.

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United Nations A/RES/64/28



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Sixty-fourth session Agenda item 94

Resolution adopted by the General Assembly

[without reference to a Main Committee (A/64/389)]

64/28. Prevention of an arms race in outer space

The General Assembly,

Recognizing the common interest of all mankind in the exploration and use of outer space for peaceful purposes,

Reaffirming the will of all States that the exploration and use of outer space, including the Moon and other celestial bodies, shall be for peaceful purposes and shall be carried out for the benefit and in the interest of all countries, irrespective of their degree of economic or scientific development,

Reaffirming also the provisions of articles III and IV of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, ¹

Recalling the obligation of all States to observe the provisions of the Charter of the United Nations regarding the use or threat of use of force in their international relations, including in their space activities,

Reaffirming paragraph 80 of the Final Document of the Tenth Special Session of the General Assembly,² in which it is stated that in order to prevent an arms race in outer space, further measures should be taken and appropriate international negotiations held in accordance with the spirit of the Treaty,

Recalling its previous resolutions on this issue, and taking note of the proposals submitted to the General Assembly at its tenth special session and at its regular sessions, and of the recommendations made to the competent organs of the United Nations and to the Conference on Disarmament,

Recognizing that prevention of an arms race in outer space would avert a grave danger for international peace and security,

Emphasizing the paramount importance of strict compliance with existing arms limitation and disarmament agreements relevant to outer space, including

² Resolution S-10/2.



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¹ United Nations, *Treaty Series*, vol. 610, No. 8843.

bilateral agreements, and with the existing legal regime concerning the use of outer space,

Considering that wide participation in the legal regime applicable to outer space could contribute to enhancing its effectiveness,

Noting that the Ad Hoc Committee on the Prevention of an Arms Race in Outer Space, taking into account its previous efforts since its establishment in 1985 and seeking to enhance its functioning in qualitative terms, continued the examination and identification of various issues, existing agreements and existing proposals, as well as future initiatives relevant to the prevention of an arms race in outer space,³ and that this contributed to a better understanding of a number of problems and to a clearer perception of the various positions,

Noting also that there were no objections in principle in the Conference on Disarmament to the re-establishment of the Ad Hoc Committee, subject to re-examination of the mandate contained in the decision of the Conference on Disarmament of 13 February 1992,⁴

Emphasizing the mutually complementary nature of bilateral and multilateral efforts for the prevention of an arms race in outer space, and hoping that concrete results will emerge from those efforts as soon as possible,

Convinced that further measures should be examined in the search for effective and verifiable bilateral and multilateral agreements in order to prevent an arms race in outer space, including the weaponization of outer space,

Stressing that the growing use of outer space increases the need for greater transparency and better information on the part of the international community,

Recalling, in this context, its previous resolutions, in particular resolutions 45/55 B of 4 December 1990, 47/51 of 9 December 1992 and 48/74 A of 16 December 1993, in which, inter alia, it reaffirmed the importance of confidence-building measures as a means conducive to ensuring the attainment of the objective of the prevention of an arms race in outer space,

Conscious of the benefits of confidence- and security-building measures in the military field,

Recognizing that negotiations for the conclusion of an international agreement or agreements to prevent an arms race in outer space remain a priority task of the Conference on Disarmament and that the concrete proposals on confidence-building measures could form an integral part of such agreements,

Noting with satisfaction the constructive, structured and focused debate on the prevention of an arms race in outer space at the Conference on Disarmament in 2009.

Taking note of the introduction by China and the Russian Federation at the Conference on Disarmament of the draft treaty on the prevention of the placement of weapons in outer space and of the threat or use of force against outer space objects,⁵

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³ Official Records of the General Assembly, Forty-ninth Session, Supplement No. 27 (A/49/27), sect. III.D (para. 5 of the quoted text).

⁴ CD/1125.

⁵ See CD/1839.

Taking note also of the decision of the Conference on Disarmament to establish for its 2009 session a working group to discuss, substantially, without limitation, all issues related to the prevention of an arms race in outer space,

- 1. Reaffirms the importance and urgency of preventing an arms race in outer space and the readiness of all States to contribute to that common objective, in conformity with the provisions of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies;¹
- 2. Reaffirms its recognition, as stated in the report of the Ad Hoc Committee on the Prevention of an Arms Race in Outer Space, that the legal regime applicable to outer space does not in and of itself guarantee the prevention of an arms race in outer space, that the regime plays a significant role in the prevention of an arms race in that environment, that there is a need to consolidate and reinforce that regime and enhance its effectiveness and that it is important to comply strictly with existing agreements, both bilateral and multilateral;
- 3. *Emphasizes* the necessity of further measures with appropriate and effective provisions for verification to prevent an arms race in outer space;
- 4. Calls upon all States, in particular those with major space capabilities, to contribute actively to the objective of the peaceful use of outer space and of the prevention of an arms race in outer space and to refrain from actions contrary to that objective and to the relevant existing treaties in the interest of maintaining international peace and security and promoting international cooperation;
- 5. Reiterates that the Conference on Disarmament, as the sole multilateral disarmament negotiating forum, has the primary role in the negotiation of a multilateral agreement or agreements, as appropriate, on the prevention of an arms race in outer space in all its aspects;
- 6. *Invites* the Conference on Disarmament to establish a working group under its agenda item entitled "Prevention of an arms race in outer space" as early as possible during its 2010 session;
- 7. *Recognizes*, in this respect, the growing convergence of views on the elaboration of measures designed to strengthen transparency, confidence and security in the peaceful uses of outer space;
- 8. *Urges* States conducting activities in outer space, as well as States interested in conducting such activities, to keep the Conference on Disarmament informed of the progress of bilateral and multilateral negotiations on the matter, if any, so as to facilitate its work;
- 9. *Decides* to include in the provisional agenda of its sixty-fifth session the item entitled "Prevention of an arms race in outer space".

55th plenary meeting 2 December 2009 This page intentionally left blank.

United Nations A/RES/64/49



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Sixty-fourth session Agenda item 96 (v)

Resolution adopted by the General Assembly

[on the report of the First Committee (A/64/391)]

64/49. Transparency and confidence-building measures in outer space activities

The General Assembly,

Recalling its resolutions 60/66 of 8 December 2005, 61/75 of 6 December 2006, 62/43 of 5 December 2007 and 63/68 of 2 December 2008,

Reaffirming that the prevention of an arms race in outer space would avert a grave danger to international peace and security,

Conscious that further measures should be examined in the search for agreements to prevent an arms race in outer space, including the weaponization of outer space,

Recalling, in this context, its previous resolutions, including resolutions 45/55 B of 4 December 1990 and 48/74 B of 16 December 1993, which, inter alia, emphasize the need for increased transparency and confirm the importance of confidence-building measures as a means conducive to ensuring the attainment of the objective of the prevention of an arms race in outer space,

Recalling also the report of the Secretary-General of 15 October 1993 to the General Assembly at its forty-eighth session, the annex to which contains the study by governmental experts on the application of confidence-building measures in outer space, ¹

Noting the constructive debate which the Conference on Disarmament held on this subject in 2009, including the views expressed by Member States,

Noting also the introduction by China and the Russian Federation at the Conference on Disarmament of the draft treaty on the prevention of the placement of weapons in outer space and of the threat or use of force against outer space objects,²

² See CD/1839.



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¹ A/48/305 and Corr.1.

Noting further the presentation by the European Union of a draft code of conduct for outer space activities,

Noting the contribution of Member States which have submitted to the Secretary-General concrete proposals on international outer space transparency and confidence-building measures pursuant to paragraph 1 of resolution 61/75, paragraph 2 of resolution 62/43 and paragraph 2 of resolution 63/68,

- 1. Takes note of the reports of the Secretary-General containing concrete proposals from Member States on international outer space transparency and confidence-building measures;³
- 2. *Invites* all Member States to continue to submit to the Secretary-General concrete proposals on international outer space transparency and confidence-building measures in the interest of maintaining international peace and security and promoting international cooperation and the prevention of an arms race in outer space;
- 3. Requests the Secretary-General to submit to the General Assembly at its sixty-fifth session a final report with an annex containing concrete proposals from Member States on international outer space transparency and confidence-building measures pursuant to resolutions 61/75, 62/43, 63/68 and the present resolution;
- 4. *Decides* to include in the provisional agenda of its sixty-fifth session the item entitled "Transparency and confidence-building measures in outer space activities".

55th plenary meeting 2 December 2009

³ A/62/114 and Add.1, A/63/136 and Add.1 and A/64/138 and Add.1.

United Nations A/RES/64/86



Distr.: General 13 January 2010

Sixty-fourth session Agenda item 30

Resolution adopted by the General Assembly

[on the report of the Special Political and Decolonization Committee (Fourth Committee) (A/64/404)]

64/86. International cooperation in the peaceful uses of outer space

The General Assembly,

Recalling its resolutions 51/122 of 13 December 1996, 54/68 of 6 December 1999, 59/2 of 20 October 2004, 61/110 and 61/111 of 14 December 2006, 62/101 of 17 December 2007, 62/217 of 22 December 2007 and 63/90 of 5 December 2008,

Deeply convinced of the common interest of mankind in promoting and expanding the exploration and use of outer space, as the province of all mankind, for peaceful purposes and in continuing efforts to extend to all States the benefits derived therefrom, and also of the importance of international cooperation in this field, for which the United Nations should continue to provide a focal point,

Reaffirming the importance of international cooperation in developing the rule of law, including the relevant norms of space law and their important role in international cooperation for the exploration and use of outer space for peaceful purposes, and of the widest possible adherence to international treaties that promote the peaceful uses of outer space in order to meet emerging new challenges, especially for developing countries,

Seriously concerned about the possibility of an arms race in outer space, and bearing in mind the importance of article IV of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies¹ (Outer Space Treaty),

Recognizing that all States, in particular those with major space capabilities, should contribute actively to the goal of preventing an arms race in outer space as an essential condition for the promotion and strengthening of international cooperation in the exploration and use of outer space for peaceful purposes,

Recognizing also that space debris is an issue of concern to all nations,

¹ United Nations, Treaty Series, vol. 610, No. 8843.



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Noting the progress achieved in the further development of peaceful space exploration and applications as well as in various national and cooperative space projects, which contributes to international cooperation, and the importance of further developing the legal framework to strengthen international cooperation in this field,

Convinced of the importance of the recommendations in the resolution entitled "The Space Millennium: Vienna Declaration on Space and Human Development", adopted by the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III), held at Vienna from 19 to 30 July 1999, and the need to promote the use of space technology towards implementing the United Nations Millennium Declaration.

Seriously concerned about the devastating impact of disasters,⁴

Desirous of enhancing international coordination and cooperation at the global level in disaster management and emergency response through greater access to and use of space-based services for all countries and facilitating capacity-building and institutional strengthening for disaster management, in particular in developing countries,

Deeply convinced that the use of space science and technology and their applications in areas such as telemedicine, tele-education, disaster management, environmental protection and other Earth observation applications contribute to achieving the objectives of the global conferences of the United Nations that address various aspects of economic, social and cultural development, particularly poverty eradication,

Taking note, in that regard, of the fact that the 2005 World Summit recognized the important role that science and technology play in promoting sustainable development.⁵

Having considered the report of the Committee on the Peaceful Uses of Outer Space on the work of its fifty-second session, ⁶

- 1. *Endorses* the report of the Committee on the Peaceful Uses of Outer Space on the work of its fifty-second session;⁶
- 2. Agrees that the Committee on the Peaceful Uses of Outer Space, at its fifty-third session, should consider the items recommended by the Committee at its fifty-second session;
- 3. *Notes* that, at its forty-eighth session, the Legal Subcommittee of the Committee on the Peaceful Uses of Outer Space continued its work, ⁷ as mandated by the General Assembly in its resolution 63/90;

² See Report of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space, Vienna, 19–30 July 1999 (United Nations publication, Sales No. E.00.I.3), chap. I, resolution 1.

³ See resolution 55/2.

⁴ The term "disasters" refers to natural or technological disasters.

⁵ See resolution 60/1, para. 60.

⁶ Official Records of the General Assembly, Sixty-fourth Session, Supplement No. 20 (A/64/20).

⁷ Ibid., chap. II.D; and A/AC.105/935.

- 4. Agrees that the Legal Subcommittee, at its forty-ninth session, should consider the items recommended by the Committee, 8 taking into account the concerns of all countries, in particular those of developing countries;
- 5. Also agrees that the Legal Subcommittee, at its forty-ninth session, should reconvene its Working Group on the Status and Application of the Five United Nations Treaties on Outer Space, its Working Group on Matters Relating to the Definition and Delimitation of Outer Space and its Working Group on National Legislation Relevant to the Peaceful Exploration and Use of Outer Space;
- 6. Urges States that have not yet become parties to the international treaties governing the uses of outer space⁹ to give consideration to ratifying or acceding to those treaties in accordance with their domestic law, as well as incorporating them in their national legislation;
- 7. *Notes* that, at its forty-sixth session, the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space continued its work, ¹⁰ as mandated by the General Assembly in its resolution 63/90;
- 8. Agrees that the Scientific and Technical Subcommittee, at its forty-seventh session, should consider the items recommended by the Committee, 11 taking into account the concerns of all countries, in particular those of developing countries;
- 9. Also agrees that the Scientific and Technical Subcommittee, at its forty-seventh session, should reconvene its Working Group of the Whole, its Working Group on the Use of Nuclear Power Sources in Outer Space and its Working Group on Near-Earth Objects;
- 10. *Welcomes* the fact that the Scientific and Technical Subcommittee, at its forty-seventh session, will begin consideration under a multi-year workplan of two new items, entitled "International Space Weather Initiative" ¹² and "Long-term sustainability of outer space activities", ¹³ as agreed by the Committee;
- 11. Welcomes with satisfaction the Safety Framework for Nuclear Power Source Applications in Outer Space, adopted by the Scientific and Technical Subcommittee at its forty-sixth session and endorsed by the Committee at its fifty-second session;¹⁴

⁸ See Official Records of the General Assembly, Sixty-fourth Session, Supplement No. 20 (A/64/20), paras. 224, 226 and 227.

⁹ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (United Nations, *Treaty Series*, vol. 610, No. 8843); Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (United Nations, *Treaty Series*, vol. 672, No. 9574); Convention on International Liability for Damage Caused by Space Objects (United Nations, *Treaty Series*, vol. 961, No. 13810); Convention on Registration of Objects Launched into Outer Space (United Nations, *Treaty Series*, vol. 1023, No. 15020); and Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (United Nations, *Treaty Series*, vol. 1363, No. 23002).

¹⁰ See Official Records of the General Assembly, Sixty-fourth Session, Supplement No. 20 (A/64/20), chap. II.C; and A/AC.105/933.

¹¹ See Official Records of the General Assembly, Sixty-fourth Session, Supplement No. 20 (A/64/20), paras. 163 and 164.

¹² Ibid., paras, 155 and 164; and A/AC, 105/933, annex I, para, 16.

¹³ See Official Records of the General Assembly, Sixty-fourth Session, Supplement No. 20 (A/64/20), paras. 161 and 164.

¹⁴ Ibid., para. 138; and A/AC.105/934.

- 12. Notes that the International Atomic Energy Agency Commission on Safety Standards agreed on the Safety Framework at its twenty-fifth meeting, which was held in Vienna from 22 to 24 April 2009, and welcomes the constructive and efficient cooperation between the Scientific and Technical Subcommittee and the International Atomic Energy Agency in the preparation of the Safety Framework, which is an example of successful inter-agency cooperation within the United Nations system;
- 13. Notes with appreciation that some States are already implementing space debris mitigation measures on a voluntary basis, through national mechanisms and consistent with the Space Debris Mitigation Guidelines of the Inter-Agency Space Debris Coordination Committee and with the Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space, 15 endorsed by the General Assembly in its resolution 62/217;
- 14. *Invites* other States to implement, through relevant national mechanisms, the Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space;¹⁵
- 15. Considers that it is essential that Member States pay more attention to the problem of collisions of space objects, including those with nuclear power sources, with space debris, and other aspects of space debris, calls for the continuation of national research on this question, for the development of improved technology for the monitoring of space debris and for the compilation and dissemination of data on space debris, also considers that, to the extent possible, information thereon should be provided to the Scientific and Technical Subcommittee, and agrees that international cooperation is needed to expand appropriate and affordable strategies to minimize the impact of space debris on future space missions;
- 16. Urges all States, in particular those with major space capabilities, to contribute actively to the goal of preventing an arms race in outer space as an essential condition for the promotion of international cooperation in the exploration and use of outer space for peaceful purposes;
- 17. Notes with appreciation that the activities planned by the United Nations Programme on Space Applications for 2010 would address, inter alia, water resources management, socio-economic benefits of space activities, small satellite technology for sustainable development, space weather, global navigation satellite systems, search and rescue and space law; 16
- 18. Welcomes the progress made by the International Committee on Global Navigation Satellite Systems towards achieving compatibility and interoperability among global and regional space-based positioning, navigation and timing systems and in the promotion of the use of global navigation satellite systems and their integration into national infrastructure, particularly in developing countries, and notes with satisfaction that the International Committee held its third meeting in Pasadena, United States of America, from 8 to 12 December 2008 and its fourth meeting in Saint Petersburg, Russian Federation, from 14 to 18 September 2009, and that its fifth meeting will be jointly organized by Italy and the European Commission in 2010;

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¹⁵ See Official Records of the General Assembly, Sixty-second Session, Supplement No. 20 (A/62/20), paras. 117 and 118, and annex.

¹⁶ Ibid., Sixty-fourth Session, Supplement No. 20 (A/64/20), para. 82.

- 19. *Endorses* the recommendation of the Committee on the Peaceful Uses of Outer Space that the Office for Outer Space Affairs of the Secretariat should continue to serve as the executive secretariat of the International Committee on Global Navigation Satellite Systems and its Providers' Forum;¹⁷
- 20. Notes with satisfaction the progress made within the framework of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER) in the implementation of the platform programme for the period 2007–2009;
- 21. *Endorses* the workplan of the UN-SPIDER programme for the biennium 2010–2011,¹⁸ and encourages Member States to provide all support necessary, on a voluntary basis, to UN-SPIDER, including financial support, to enable it to carry out the workplan;
- 22. Welcomes the fact that, in accordance with General Assembly resolution 61/110, regional support offices were established in the Islamic Republic of Iran, Nigeria and Romania, and that a cooperation agreement was reached with the Asian Disaster Reduction Centre, to support the implementation of the activities of the UN-SPIDER programme;¹⁹
- 23. Notes with appreciation that the African regional centres for space science and technology education in the French and English languages, located in Morocco and Nigeria, respectively, as well as the Centre for Space Science and Technology Education in Asia and the Pacific and the Regional Centre for Space Science and Technology Education for Latin America and the Caribbean, affiliated to the United Nations, have continued their education programmes in 2009;
- 24. *Welcomes* the fact that the regional centres would serve as International Committee on Global Navigation Satellite Systems information centres;²⁰
- 25. Agrees that the regional centres should continue to report to the Committee on their activities on an annual basis;
- 26. *Emphasizes* that regional and interregional cooperation in the field of space activities is essential to strengthen the peaceful uses of outer space, assist States in the development of their space capabilities and contribute to the achievement of the goals of the United Nations Millennium Declaration,³ and to that end fosters interregional dialogue on space matters between Member States;
- 27. Recognizes, in this regard, the important role played by conferences and other mechanisms in strengthening regional and international cooperation among States, such as the Third African Leadership Conference on Space Science and Technology for Sustainable Development, to be held in Algiers from 7 to 9 December 2009; the sixteenth session of the Asia-Pacific Regional Space Agency Forum, to be held in Bangkok from 26 to 29 January 2010 in cooperation with the Sentinel Asia project; the Asia-Pacific Space Cooperation Organization, with headquarters in Beijing, which started operating formally in December 2008; and the International Air and Space Fair, to be held in Santiago from 23 to 28 March 2010;

¹⁷ Ibid., para. 133.

¹⁸ A/AC.105/937, annex.

¹⁹ See Official Records of the General Assembly, Sixty-fourth Session, Supplement No. 20 (A/64/20), para. 122.

²⁰ Ibid., para. 132.

- 28. Notes with appreciation that since the adoption of the Declaration of San Francisco de Quito by the Fifth Space Conference of the Americas in July 2006, more States in the Latin America and Caribbean region have set up national space entities of a civilian nature, thus laying the foundation for enhanced regional cooperation in the peaceful uses of outer space, and recalls that in the Declaration, States in the Latin America and Caribbean region were invited to, inter alia, "set up national space entities to lay the foundation for a regional entity for cooperation";
- 29. Welcomes, in that regard, the fact that the Government of Mexico will host the Sixth Space Conference of the Americas from 22 to 27 November 2010 and that the preparatory meeting for the Conference will be held in Santiago in June 2010:
- 30. *Emphasizes* the need to increase the benefits of space technology and its applications and to contribute to an orderly growth of space activities favourable to sustained economic growth and sustainable development in all countries, including mitigation of the consequences of disasters, in particular in the developing countries;
- 31. Notes that space science and technology and their applications could make important contributions to economic, social and cultural development and welfare, as indicated in the resolution entitled "The Space Millennium: Vienna Declaration on Space and Human Development", its resolution 59/2 and the Plan of Action of the Committee on the Peaceful Uses of Outer Space on the implementation of the recommendations of UNISPACE III; 21
- 32. *Notes with appreciation* that a number of the recommendations set out in the Plan of Action have been implemented and that satisfactory progress is being made in implementing the outstanding recommendations;
- 33. *Urges* all Member States to continue to contribute to the Trust Fund for the United Nations Programme on Space Applications to enhance the capacity of the Office for Outer Space Affairs to provide technical and legal advisory services in accordance with the Plan of Action, while maintaining the priority thematic areas agreed by the Committee;
- 34. Reiterates that the benefits of space technology and its applications should continue to be brought to the attention, in particular, of the major United Nations conferences and summits for economic, social and cultural development and related fields and that the use of space technology should be promoted towards achieving the objectives of those conferences and summits and for implementing the United Nations Millennium Declaration;
- 35. Notes with appreciation that the initiative of the Chairman of the Committee on the Peaceful Uses of Outer Space to seek a holistic approach for enhancing coordination between Member States and the United Nations system in applying space science and technology to meet the challenges to development of all countries and to further promote and strengthen the use of space technology and its applications in the United Nations system would be further developed for the consideration of the Committee at its fifty-third session;²²

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²¹ See A/59/174, sect. VI.B.

²² See Official Records of the General Assembly, Sixty-fourth Session, Supplement No. 20 (A/64/20), paras. 15 and 290.

- 36. Welcomes the increased efforts to strengthen further the Inter-Agency Meeting on Outer Space Activities as the central United Nations mechanism for building partnerships and coordinating space-related activities within the framework of the ongoing reforms in the United Nations system to work in unison and deliver as one, and encourages entities of the United Nations system to participate fully in the work of the Inter-Agency Meeting;
- 37. *Urges* entities of the United Nations system, particularly those participating in the Inter-Agency Meeting on Outer Space Activities, to continue to examine, in cooperation with the Committee, how space science and technology and their applications could contribute to implementing the United Nations Millennium Declaration on the development agenda, particularly in the areas relating to, inter alia, food security and increasing opportunities for education;
- 38. *Invites* the Inter-Agency Meeting on Outer Space Activities to continue to contribute to the work of the Committee and to report to the Committee on the work conducted at its annual sessions;
- 39. Notes with satisfaction that the open informal meetings, held in conjunction with the annual sessions of the Inter-Agency Meeting on Outer Space Activities and in which representatives of member States and observers in the Committee participate, provide a constructive mechanism for an active dialogue between the entities of the United Nations system and member States and observers in the Committee;
- 40. Welcomes the contribution of the Committee to the work of the Commission on Sustainable Development, 23 and agrees that the Director of the Office for Outer Space Affairs of the Secretariat should continue to participate in the sessions of the Commission to raise awareness and promote the benefits of space science and technology for sustainable development, and that the Director of the Division for Sustainable Development of the Department of Economic and Social Affairs of the Secretariat should continue to be invited to participate in the sessions of the Committee to inform it how it could further contribute to the work of the Commission;
- 41. Requests the United Nations University and other scientific institutions and the Economic Commission for Latin America and the Caribbean to explore the possibilities of providing training and policy research at the crossroads of international law, climate change and outer space;
- 42. Requests the Committee to continue to consider, as a matter of priority, ways and means of maintaining outer space for peaceful purposes and to report thereon to the General Assembly at its sixty-fifth session, and agrees that during its consideration of the matter the Committee could continue to consider ways to promote regional and interregional cooperation based on experiences stemming from the Space Conferences of the Americas, the African Leadership Conferences on Space Science and Technology for Sustainable Development and the role space technology could play in the implementation of recommendations of the World Summit on Sustainable Development;

²³ See A/AC.105/872, A/AC.105/892 and A/AC.105/944.

- 43. *Endorses* the composition of the bureaux of the Committee and its subcommittees for the period 2010–2011,²⁴ and agrees that the Committee and its subcommittees should elect their officers at their respective sessions in 2010 in accordance with that composition;
- 44. *Also endorses* the decision of the Committee to grant permanent observer status to the Asia-Pacific Space Cooperation Organization;²⁵
- 45. *Notes* that each of the regional groups has the responsibility for actively promoting the participation in the work of the Committee and its subsidiary bodies of the member States of the Committee that are also members of the respective regional groups, and agrees that the regional groups should consider this Committee-related matter among their members;
- 46. Requests entities of the United Nations system and other international organizations to continue and, where appropriate, to enhance their cooperation with the Committee and to provide it with reports on the issues dealt with in the work of the Committee and its subsidiary bodies, notes with satisfaction that a panel discussion on space applications and global health was held at United Nations Headquarters on 20 October 2009, and agrees that a panel discussion should be held at the sixty-fifth session of the General Assembly on a topic to be selected by the Committee, taking into account the panel discussions held on climate change, food security and global health.

62nd plenary meeting 10 December 2009

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²⁴ See Official Records of the General Assembly, Sixty-fourth Session, Supplement No. 20 (A/64/20), para. 309.

²⁵ Ibid., para. 311.

Monthly Statement of Treaties and International Agreements

Space related agreements registered in the U.N.'s Monthly Statement of Treaties and International Agreements (volumes 2009/1-2009/9)

2009/1

No. 45651. France and European Space Agency

Agreement between the Government of the French Republic and the European Space Agency on the launching site and associated installations of the Agency at the Guyanese Space Centre (with annexes). Paris, 11 April 2002

Entry into force: 2 October 2006 by notification, in accordance with article 20

Authentic text: French

Registration with the Secretariat of the United Nations: France, 9 January 2009

2009/3

No. 15020. Multilateral

Convention on registration of objects launched into outer space. New York, 12 November 1974

Accession: Democratic People's Republic of Korea

Deposit of instrument with the Secretary-General of the United Nations: 10 March 2009

Date of effect: 10 March 2009

Registration with the Secretariat of the United Nations: ex officio, 10 March 2009

2009/4

No. 45946. Mexico and Russian Federation

Agreement between the Government of the United Mexican States and the Government of the Russian Federation on cooperation in the field of exploration and utilization of outer space for peaceful purposes. Mexico City, 20 May 1996

Entry into force: 29 November 1996 by notification, in accordance with article 9

Authentic texts: Russian and Spanish

Registration with the Secretariat of the United Nations: Mexico, 6 April 2009

2009/5

No. 46117. France and European Space Agency

Agreement between the Government of the French Republic and the European Space Agency on the Soyouz launch complex (SLC) at the Guyanese Space Center (GSC) and linked to the implementation of the optional programme of the European Space Agency entitled "Soyouz at CSG" and to the exploitation of Soyouz from CSG (with annexes). Paris, 21 March 2005

Entry into force: 26 December 2007 by notification, in accordance with article 15

Authentic text: French

Registration with the Secretariat of the United Nations: France, 21 May 2009

2009/7

No. 15020. Multilateral

Convention on registration of objects launched into outer space. New York, 12 November 1974

Accession: Nigeria

Deposit of instrument with the Secretary-General of the United

Nations: 6 July 2009

Date of effect: 6 July 2009

Registration with the Secretariat of the United Nations: ex officio, 6 July 2009

2009/9

No. 13810. Multilateral

Convention on the international liability for damage caused by space objects. London, 29 March

1972, Moscow, 29 March 1972 and

Washington, 29 March 1972

Ratification: Lebanon

Deposit of instrument with the Government of the United Kingdom of Great Britain and

Northern Ireland: 23 May 2006 Date of effect: 23 May 2006

Registration with the Secretariat of the United Nations: United Kingdom of Great Britain and

Northern Ireland, 28 September 2009

POSTAL ADDRESS—ADRESSE POSTALE. UNITED NATIONS, N.Y. 10017

CABLE ADDRESS—ADRESSE TELEGRAPHIQUE: UNATIONS NEWYORK

Reference: C.N.154.2009.TREATIES-1 (Depositary Notification)

CONVENTION ON REGISTRATION OF OBJECTS LAUNCHED INTO OUTER SPACE

NEW YORK, 12 NOVEMBER 1974

DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA: ACCESSION

The Secretary-General of the United Nations, acting in his capacity as depositary, communicates the following:

The above action was effected on 10 March 2009.

The Convention entered into force for the Democratic People's Republic of Korea on 10 March 2009 in accordance with its article VIII(4) which reads as follows:

"For States whose instruments of ratification or accession are deposited subsequent to the entry into force of the Convention, it shall enter into force on the date of the deposit of their instrument of ratification or accession."

10 March 2009



Attention: Treaty Services of Ministries of Foreign Affairs and of international organizations concerned. Depositary notifications are currently issued in both hard copy and electronic format. Depositary notifications are made available to the Permanent Missions to the United Nations at the following e-mail address: missions@un.int. Such notifications are also available in the United Nations Treaty Collection on the Internet at http://treaties.un.org, where interested individuals can subscribe to directly receive depositary notifications by e-mail through a new automated subscription service. Depositary notifications are available for pick-up by the Permanent Missions in Room NL-300.

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POSTAL ADDRESS—ADRESSE POSTALE: UNITED NATIONS, N.Y. 10017

CABLE ADDRESS—ADRESSE TELEGRAPHIQUE: UNATIONS NEWYORK

Reference: C.N.386.2009.TREATIES-1 (Depositary Notification)

CONVENTION ON THE INTERNATIONAL MARITIME ORGANIZATION GENEVA, 6 MARCH 1948

UGANDA: ACCEPTANCE

The Secretary-General of the United Nations, acting in his capacity as depositary, communicates the following:

The above action was effected on 30 June 2009.

The Convention entered into force for Uganda on 30 June 2009 in accordance with articles 5 and 71 of the Convention which read as follows:

- "5. Members of the United Nations may become Members of the Organization by becoming parties to the Convention in accordance with the provisions of Article 71."
- "71. ... Acceptance shall be effected by the deposit of an instrument with the Secretary-General of the United Nations."

It is further noted that, in accordance with article 66 of the Convention, amendments enter into force for all Members of the Organization.

30 June 2009

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Attention: Treaty Services of Ministries of Foreign Affairs and of international organizations concerned. Depositary notifications are currently issued in both hard copy and electronic format. Depositary notifications are made available to the Permanent Missions to the United Nations at the following e-mail address: missions@un.int. Such notifications are also available in the United Nations Treaty Collection on the Internet at http://treaties.un.org, where interested individuals can subscribe to directly receive depositary notifications by e-mail through a new automated subscription service. Depositary notifications are available for pick-up by the Permanent Missions in Room NL-300.

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POSTAL ADDRESS—ADRESSE POSTALE: UNITED NATIONS, N.Y. 10017

CABLE ADDRESS—ADRESSE TELEGRAPHIQUE: UNATIONS NEWYORK

Reference: C.N.392.2009.TREATIES-2 (Depositary Notification)

CONVENTION ON REGISTRATION OF OBJECTS LAUNCHED INTO OUTER SPACE

NEW YORK, 12 NOVEMBER 1974

NIGERIA: ACCESSION

The Secretary-General of the United Nations, acting in his capacity as depositary, communicates the following:

The above action was effected on 6 July 2009.

The Convention entered into force for Nigeria on 6 July 2009 in accordance with its article VIII(4) which reads as follows:

"For States whose instruments of ratification or accession are deposited subsequent to the entry into force of the Convention, it shall enter into force on the date of the deposit of their instrument of ratification or accession."

6 July 2009



Attention: Treaty Services of Ministries of Foreign Affairs and of international organizations concerned. Depositary notifications are currently issued in both hard copy and electronic format. Depositary notifications are made available to the Permanent Missions to the United Nations at the following e-mail address: missions@un.int. Such notifications are also available in the United Nations Treaty Collection on the Internet at http://treaties.un.org, where interested individuals can subscribe to directly receive depositary notifications by e-mail through a new automated subscription service. Depositary notifications are available for pick-up by the Permanent Missions in Room NL-300.

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MEMORANDUM OF UNDERSTANDING

BETWEEN THE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION OF THE UNITED STATES OF AMERICA

AND THE

ITALIAN SPACE AGENCY

CONCERNING THE

EUROPEAN SPACE AGENCY PLANCK MISSION

Preamble

The National Aeronautics and Space Administration of the United States of America (hereinafter referred to as "NASA") and

The Italian Space Agency (hereinafter referred to as "ASI"),

Collectively hereinafter referred to as "the Parties":

CONSIDERING that ASI was selected by the European Space Agency (ESA) to participate in the effort to provide a Low-Frequency Instrument (LFI) for the Planck mission;

CONSIDERING that NASA has shown interest in joining with ASI as a participant in the development and operation of the LFI for the ESA Planck mission;

RECALLING the interim agreement of March 29, 2001, between NASA and ASI, addressing an interest to pursue activities together on the Planck mission;

HAVE AGREED as follows:

Article 1 - Scope

1.1 This Memorandum of Understanding (MOU) defines the responsibilities, ways, and means, as well as the terms and conditions, by which the cooperation between the Parties shall be conducted for their combined role in the Planck mission.

Article 2 - The Planck Mission

- 2.1 ESA's Planck mission is intended to image the temperature and polarization anisotropies of Cosmic Microwave Background (CMB) radiation with an unprecedented combination of sensitivity, angular resolution, and frequency coverage. Planck is designed to make precise determinations of the fundamental parameters which define the cosmological constant, the Hubble constant, and the neutrino content of the universe.
- 2.2 The mission is planned for launch no earlier than October 31, 2008, aboard an Ariane V launch vehicle. It will be co-manifested with the ESA Herschel mission. Planck will operate in a nominal L2 Lissajous orbit for a nominal mission lifetime of two years.

Article 3 - Scientific Investigations

- 3.1 Planck is expected to significantly increase our understanding of the universe during its planned two-year nominal mission.
- 3.2 The primary Planck science instruments are the LFI and the High-Frequency Instrument (HFI).

Article 4 - Programmatic Responsibilities of ASI

ASI, supported by the Istituto Nazionale di Astro Fisica (INAF), shall use reasonable efforts to fulfill the responsibilities below:

- 4.1 Design, develop, and verify the LFI for integration with the HFI.
- 4.2 Oversee and be responsible for the technical contributions of all the European Co- investigators (Co-Is) of LFI.
- 4.3 Deliver the LFI to ESA and support integration into the ESA-provided Planck spacecraft.
- 4.4 Represent the LFI to ESA and provide the required ESA reporting documents and reviews.
- 4.5 Manage activities at the LFI Data Processing Center and provide hardware and software maintenance for the Center.

Article 5 - Programmatic Responsibilities of NASA

NASA, supported by the Jet Propulsion Laboratory (JPL) and other U.S. organizations, shall use reasonable efforts to fulfill the responsibilities below:

- 5.1 Support the participation of NASA-sponsored science team members in all phases of the mission.
- 5.2 Provide the following data/components of a common, fully redundant hydrogen sorption cryocooler for the Planck instruments (both the LFI and the HFI):
 - a. The test reports on the Elegant Breadboard (EBB) preflight cooler.
 - b. A cryogenic qualification model piping assembly and cold end (a subsystem of the cryocooler).
 - c. The flight model cooler, excluding electronics.
 - d. The redundant flight model cooler, excluding electronics.
- 5.3 Support LFI in operating the sorption cooler during integration and test activities, launch, commissioning, and mission operations.
- 5.4 Provide data analysis support and software support to the LFI Data Processing Center.

Article 6 - Rights in and Distribution of Scientific Data

6.1 Planck mission investigators will share Planck mission data in accordance with the Planck Science Management Plan (ESA/SPC/(2004)10) and, in particular, with chapter 5.1.1 (Delivery Schedule of Scientific Data Products) and chapter 5.2 (Scientific Data Rights and Publication Data Policy).

Article 7 - Program and Project Management

This article describes general management and organizational responsibilities. Each Party is responsible for the management of its activities as identified in Articles 4 and 5 above.

- 7.1 ESA has established a Planck Project Office at the European Science and Technology Research Center (ESTEC) in The Netherlands. The Project Office is headed by the ESA Planck Project Manager who, on behalf of the ESA Director of Science, is responsible for the overall management and implementation of the Planck mission.
- 7.2 The Planck Project Office is responsible for the design, fabrication, and launch of the Planck mission, including its scientific instruments. It is also responsible for the flight operations of the Planck mission throughout all mission phases.
- 7.3 The ASI Headquarters Observation of the Universe is responsible for the LFI hardware development and for overall programmatic and science management of the ASI-sponsored astrophysics activities. ASI has designated a Planck Program Manager and Planck Program Scientist to manage the ASI contributions to Planck. The Program Manager is also the principal point of contact for ASI in the performance of this MOU.
- 7.4 NASA has named a Planck Program Executive within the Office of Space Science at NASA Headquarters who is responsible for NASA's overall participation in the Planck mission. This responsibility includes the implementation of policies and management oversight of the Planck-related activities funded by NASA to ensure accomplishment of the mission objectives. The Program Executive is also the principal point of contact for NASA in the performance of this MOU.
- 7.5 NASA has also named a Planck Project Manager at JPL who is responsible for the implementation of all NASA contributions to this mission.

Article 8 - Transfer of Goods and Technical Data

The Parties are obligated to transfer only those technical data (including software) and goods necessary to fulfill their respective responsibilities under this MOU, in accordance with the following provisions, notwithstanding any other provision of this MOU:

- 8.1 All activities of the Parties will be carried out in accordance with their national laws and regulations, including those relating to export control and the control of classified information.
- 8.2 The transfer of technical data for the purpose of discharging the Parties' responsibilities with regard to interface, integration, and safety shall normally be made without restriction, except as provided in 8.1 above.

- 8.3 All transfers of goods and proprietary or export-controlled technical data are subject to the following provisions. In the event a Party or its Related Entity (e.g.; contractor, subcontractor, grantee, cooperating entity) finds it necessary to transfer goods or to transfer proprietary or export-controlled technical data, for which protection is to be maintained, such goods shall be specifically identified and such proprietary or exportcontrolled technical data shall be marked. The identification for goods and the marking on proprietary or export-controlled technical data will indicate that the goods and proprietary or export-controlled technical data shall be used by the receiving Party or Related Entities only for the purposes of fulfilling the receiving Party's or Related Entity's responsibilities under this MOU, and that the identified goods and marked proprietary technical data or marked export-controlled technical data shall not be disclosed or retransferred to any other entity without the prior written permission of the furnishing Party or its Related Entity. The receiving Party or Related Entity shall abide by the terms of the notice and protect any such identified goods and marked proprietary technical data or marked export-controlled technical data from unauthorized use and disclosure. The Parties to this MOU will cause their Related Entities to be bound by the provisions of this article related to use, disclosure, and retransfer of goods and marked technical data through contractual mechanisms or equivalent measures.
- 8.4 All goods exchanged in the performance of this MOU shall be used by the receiving Party or Related Entity exclusively for the purposes of this MOU. Upon completion of the activities under this MOU, the receiving Party or Related Entity shall return or, at the request of the furnishing Party or its Related Entity, otherwise dispose of all goods and marked proprietary technical data or marked export-controlled technical data provided under this MOU, as directed by the furnishing Party or Related Entity.

Article 9 - Intellectual Property

- 9.1 For the purposes of this article, "Related Entity" includes but is not limited to contractors, subcontractors, grantees, or cooperating entities (or any lower tier contractor, subcontractor, grantee, or cooperating entities) of a Party.
- 9.2 a. Nothing in this MOU shall be construed as granting, either expressly or by implication, to the other Party any rights to, or interest in, any inventions or works of a Party or its Related Entities made prior to the entry into force of, or outside the scope of, this MOU, including any patents (or similar forms of protection in any country) corresponding to such inventions or any copyrights corresponding to such works.
 - b. Any rights to, or interest in, any invention or work made in the performance of this MOU solely by one Party or any of its Related Entities, including any patents (or similar forms of protection in any country) corresponding to such invention or any copyright corresponding to such work, shall be owned by such Party or Related Entity. Allocation of rights to, or interest in, such invention or work between such Party and its Related Entities shall be determined by applicable laws, rules, regulations, and contractual obligations.

- c. It is not anticipated that there will be any joint inventions made in the performance of this MOU. Nevertheless, in the event that an invention is jointly made by the Parties in the performance of this MOU, the Parties shall, in good faith, consult and agree within 30 calendar days as to: a) the allocation of rights to, or interest in, such joint invention, including any patents (or similar forms of protection in any country) corresponding to such joint invention; b) the responsibilities, costs, and actions to be taken to establish and maintain patents (or similar forms of protection in any country) for each such joint invention; and c) the terms and conditions of any license or other rights to be exchanged between the Parties or granted by one Party to the other Party.
- d. For any work jointly authored by the Parties, should the Parties decide to register the copyright in such work, they shall, in good faith, consult and agree as to the responsibilities, costs, and actions to be taken to register copyright protection (in any country).
- e. Subject to the provisions of Articles 8 and 10, each Party shall have an irrevocable, royalty-free right to reproduce, prepare derivative works, distribute copies to the public, and perform publicly and display publicly, and authorize others to do so on its behalf, any copyrighted work resulting from activities undertaken in the performance of this MOU for its own purposes, regardless of whether the work was created solely by, or on behalf of, that Party or jointly with the other Party, and without consulting with or accounting to the other Party.

Article 10 - Publication of Public Information and Results

- 10.1 The Parties retain the right to release public information regarding their own activities under this MOU. The Parties shall coordinate with each other in advance concerning releasing to the public any information that relates to the other Party's responsibilities or performance under this MOU. Full acknowledgement shall be made by both Parties of the role of the other Party in the Planck mission.
- 10.2 The Parties shall make the final results obtained from the Planck mission available to the general scientific community in accordance with provisions of the Planck Science Management Plan (ESA/SPC/(2004)10 and, in particular, with chapter 5.2 (Scientific Data Rights and Publication Data Policy).
- 10.3 The Parties acknowledge that the following data or information does not constitute public information and that such data or information shall not be included in any publication or presentation by a Party under this article without the other Party's prior written permission: 1) data furnished by the other Party in accordance with Article 8 of this MOU which is export-controlled, classified, or proprietary; or 2) information about an invention of the other Party before a patent application has been filed covering the same, or a decision not to file has been made.

Article 11 - Financial Arrangements

11.1 Each Party will bear the costs of discharging its respective responsibilities, including travel and subsistence of personnel and transportation of all equipment and other items for which it is responsible. Further, it is understood that the ability of the Parties to carry out their obligations is subject to the availability of appropriated funds. Should either Party encounter budgetary problems that may affect the activities to be carried out under this MOU, the Party encountering the problems will notify and consult with the other Party as soon as possible to minimize the negative impact of such problems on the cooperation.

Article 12 - Customs Clearance, Taxes, Immigration, and Ownership

- 12.1 In accordance with the laws and regulations governing the Parties, each Party shall facilitate free customs clearance and waiver of all applicable customs duties and taxes for equipment and related goods necessary for the implementation of this MOU. In the event that any customs duties or taxes of any kind are nonetheless levied on such equipment and related goods, such customs duties or taxes shall be borne by the Party of the country levying such customs duties or taxes. The Parties' obligation to facilitate duty-free entry and exit of equipment and related goods is fully reciprocal.
- 12.2 Subject to applicable laws and regulations, each Party shall facilitate provision of the appropriate entry and residence documentation for the other Party's personnel who enter, exit, or reside within its territory to carry out the activities under this MOU.
- 12.3 Equipment provided by ASI pursuant to this MOU will remain the property of ASI. Equipment provided by NASA pursuant to this MOU will remain the property of NASA.

Article 13 - Exchange of Technical Personnel

- 13.1 Each Party may temporarily locate a mutually agreed-upon number of its personnel at the other Party's respective facilities in the United States and Italy to participate in technical activities described in this MOU. Each Party shall provide workspace and necessary office equipment to accommodate the other Party's personnel that shall be temporarily located in the United States and Italy. Salary and all other personnel expenses, such as living and travel expenses, shall be borne by the employing Party of the technical representative(s) throughout the duration of their assignment. Arrangements for, and all conditions relating to, the personnel relationships shall be agreed to and jointly documented in writing between NASA and ASI. These personnel shall comply with the safety and security rules and regulations of the hosting Party.
- 13.2 NASA and ASI shall provide, on occasion and as appropriate, for personnel to visit each Agency's facilities to participate in integration and testing and to observe, confer, and advise the other Party regarding aspects of design and development of compatible instrument interfaces, integration, and testing.

Article 14 - Liability

- 14.1 The Parties agree that a comprehensive cross-waiver of liability among the Parties and their related entities will further participation in space exploration, use, and investment. The cross-waiver of liability shall be broadly construed to achieve this objective. The terms of the waiver are set out below.
- 14.2 The following terms, as used in this article, are defined below:
 - a. The term "Party" has the meaning specified in the Preamble;
 - b. The term "related entity" means:
 - (i) a contractor, subcontractor, or sponsored entity of a Party at any tier;
 - (ii) a user or customer of a Party at any tier;
 - (iii) a contractor or subcontractor of a user or customer or sponsored entity of a Party at any tier; or
 - (iv) scientific investigators.

The term "related entity" may also include another State or an agency or institution of another State, where such State, agency, or institution is an entity as described in (i) through (iv) above or is otherwise involved in the activities undertaken pursuant to this MOU.

The terms "contractors" and "subcontractors" include suppliers of any kind.

- c. The term "damage" means:
 - (i) bodily injury to, or other impairment of health of, or death of, any person;
 - (ii) damage to, loss of, or loss of use of any property;
 - (iii) loss of revenue or profits; or
 - (iv) other direct, indirect, or consequential damage.
- d. The term "launch vehicle" means an object or any part thereof intended for launch, launched from Earth, or returning to Earth that carries payloads or persons, or both;
- e. The term "payload" means all property to be flown or used on or in a launch vehicle; and
- f. The term "Protected Space Operations" means all activities pursuant to this MOU, including launch vehicle activities and payload activities on Earth, in outer space, or in transit between Earth and outer space. "Protected Space Operations" begin at the signature of this MOU and end when all activities done in implementation of this MOU are completed.

[&]quot;Protected Space Operations" include, but are not limited to the following:

- (i) research, design, development, test, manufacture, assembly, integration, operation, or use of launch or transfer vehicles, payloads, or instruments, as well as related support equipment, facilities, and services; and
- (ii) all activities related to ground support, testing, training, simulation, or guidance and control equipment and related facilities or services.

The term "Protected Space Operations" excludes activities on Earth that are conducted on return from space to develop further a payload's product or process for use other than for the joint activity in question.

- 14.3. a. Each Party agrees to a cross-waiver of liability pursuant to which each Party waives all claims against any of the entities or persons listed in subparagraphs (i) through (iii) below based on damage arising out of Protected Space Operations. This cross-waiver shall apply only if the person, entity, or property causing the damage is involved in Protected Space Operations and the person, entity, or property damaged is damaged by virtue of its involvement in Protected Space Operations. This cross-waiver shall apply to any claims for damage, whatever the legal basis for such claims, against:
 - (i) the other Party;
 - (ii) a related entity of the other Party; or
 - (iii) the employees of any of the entities identified in subparagraphs (i) and (ii) immediately above.
 - b. In addition, each Party shall extend the cross-waiver of liability, as set forth in subparagraph 14.3.a above, to its own related entities by requiring them, by contract or otherwise, to agree to waive all claims against the entities or persons identified in subparagraphs 14.3.a (i) through 14.3.a (ii) above.
 - c. Notwithstanding the other provisions of this section, this cross-waiver of liability shall not be applicable to:
 - (i) claims between a Party and its own related entity or between its own related entities;
 - (ii) claims made by a natural person, his/her estate, survivors, or subrogees for bodily injury, other impairment of health, or death of such natural person, except where the subrogee is a Party to this MOU or has otherwise agreed to be bound by the terms of this cross-waiver.
 - (iii) claims for damage caused by willful misconduct;
 - (iv) intellectual property claims;
 - (v) claims for damage resulting from a failure of a Party to extend the cross-waiver of liability, as set forth in subparagraph 14.3.b, or from a failure of a Party to ensure that their related entities extend the cross-waiver of liability, as set forth in subparagraph 14.3.b; or
 - (vi) contract claims between the Parties based on the express contractual provisions.

- d. Nothing in this article shall be construed to create the basis for a claim or suit where none would otherwise exist.
- e. For avoidance of doubt, this cross-waiver of liability includes a cross-waiver of liability arising from the 1972 Convention on International Liability for Damage Caused by Space Objects where the person, entity, or property causing the damage is involved in Protected Space Operations and the person, entity, or property damaged is damaged by virtue of its involvement in Protected Space Operations.
- f. In the event of third-party claims for which the Parties may be liable, the Parties will consult promptly to determine an appropriate and equitable apportionment of any potential liability and on the defense of any such claims.

Article 15 - Registration of Space Objects

- 15.1 NASA and ASI acknowledge that ESA is entitled to register Planck as a space object in accordance with the 1975 Convention on Registration of Objects Launched into Outer Space (the Registration Convention). ESA shall retain jurisdiction and control over the space objects it registers.
- 15.2 Registration pursuant to this article shall not affect the rights or obligations of either Party or its Government under the 1972 Convention on International Liability for Damage Caused by Space Objects.

Article 16 - Mishap Investigation

16.1 In the case of a mishap or mission failure, the Parties agree to provide assistance to each other in the conduct of any investigation, bearing in mind, in particular, the provisions of Article 8 of this MOU. In the case of activities that might result in the death of or serious injury to persons, or substantial loss of or damage to property as a result of activities under this MOU, the Parties agree to establish a process for investigating any such mishap as part of their program/project implementation plans.

Article 17 - Amendment

17.1 This MOU may be amended or extended by written agreement of the Parties.

Article 18 - Consultation and Settlement of Disputes

- 18.1 The Parties' respective points of contact, identified in Article 7.3 and 7.4, shall consult promptly with each other on all issues involving interpretation or implementation of this MOU. These points of contact will attempt to resolve all issues arising from the implementation of this MOU.
- 18.2 In the case of a question of interpretation or implementation of the terms of this MOU, such questions that cannot be resolved by the Parties' respective points of contact shall

be referred for joint resolution to the NASA Associate Administrator for Science Mission Directorate and to the ASI Director of the Observation of the Universe, or their designees; and if unresolved at this level, then to the NASA Administrator and the ASI President, or their designees, for joint resolution.

Article 19 - Entry into Force and Termination

- 19.1 This MOU shall enter into force upon signature by the Parties and the conclusion of an agreement to be effected by an exchange of diplomatic notes incorporating the terms and conditions of this MOU. This MOU shall remain in force until December 31, 2014, to permit completion of the Planck mission and data-analysis period. This MOU may be extended by mutual written agreement of the Parties, provided that the agreement effected by the exchange of notes remains in force. The interim agreement of March 29, 2001, shall terminate upon entry into force of this MOU.
- 19.2 Either Party may terminate this MOU at any time by giving the other Party at least six months written notice of its intent to terminate. Termination of this MOU shall not affect a Party's continuing obligations under Articles 6, Rights in and Distribution of Scientific Data; 8, Transfer of Goods and Technical Data; 9, Intellectual Property; 12, Customs Clearance, Taxes, Immigration, and Ownership; and 14, Liability, that shall continue to apply after the expiration or termination of this MOU. In the event of termination, the Parties shall endeavor to minimize the negative impacts of such termination on the other Party.

Done in duplicate in the English language.

For the National Aeronautics and Space Administration of

the United States of America

Date: JANUARY 26, 2009

Date: Februsery 6th 2009

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18-03-2009 JOINT STATEMENT

of the European Space Agency, the European Commission and the Federal Space Agency on the implementation of the EU-Russia Dialogue on Space Cooperation

On the occasion of the fourth meeting of the Steering Board under the Space Dialogue the three participating organisations - the European Space Agency (ESA), the European Commission and Roscosmos reviewed the progress made since their last meeting in Paris in June 2008. The European Commission and the European Space Agency informed the Russian side about the state of implementation of the European Space Policy launched in May 2007, notably as regards the European GALILEO and GMES programmes. They also informed about the outcome of the 5th European Space Council meeting in September 2008 identifying the future priority areas of space activity. ESA introduced the outcome of the ESA Council Meeting held at Ministerial Level in November 2008. The Russian side informed about the priorities and further planning in implementing its national space programmes. The three sides confirmed that mutually beneficial international cooperation was an important element in implementing their respective priorities. They also noted that space-related innovation and technology development could offer promising avenues to address the challenges of the current global economic and financial crisis. The Parties noted with satisfaction the further progress in conducting and deepening the regular dialogue at working level in the various fields of Space activities between the Russian Federation, the European Union and ESA, in line with the Terms of Reference agreed in March 2006 and based on the Road Maps for the creation of EU-Russia Common Spaces adopted by the May 2005 EU-Russia Summit. The following seven working groups under the trilateral Space Dialogue held further regular meetings since June 2008: - Earth Observation - Satellite Navigation - Satellite Communication - Fundamental Space Science - Applied Space Science and Technology -Launch Systems - Crew Space Transportation System (Spaceship) Most of them made substantial progress in their activities. The Steering Board took note of presentations of the Cochairs of the working groups on their activities and progress achieved, discussed and finally adopted their revised work plans for the period 2009-2010. The following actions have been identified by the Steering Board as priorities for the period 2009-2010:

- Earth observation: Implement an ESA-Roscosmos data exchange arrangement in support
 of joint research projects in the areas of agriculture, forestry, earthquake precursors and
 arctic regions. Encourage European and Russian research entities to participate in the
 upcoming FP7 Space call in view of improving the base for implementing relevant
 projects. Exchange information on in-situ infrastructure relevant to Earth Observation
 services.
- Satellite Navigation: Formal steps will be taken for the negotiations of the overarching GNSS (Galileo-EGNOS/GLONASS-SDCM) cooperation agreement. The EU and Russia will exchange information related to their plans for developing regional augmentation systems. In the shorter term, further progress is expected from the experts of the Technical Working Group as regards the central issues of compatibility and interoperability of GALILEO and GLONASS. In addition, for Search and Rescue, both sides will cooperate jointly to define performance validation procedures and ground segment operations.

- Satellite communications: Further investigate the scope of cooperation in satellite
 communications with space agencies and other commercial and institutional actors for
 the development of joint applications and services. Topics to be assessed include
 technology, services, improved broadband access, improved mobility for broadband
 services, future air traffic communications via satellites, and interoperability of Russian
 and European Data Relay Satellites.
- Fundamental Space Science: Further implement the ESA Roscosmos Exomars Phobos Grunt Agreement, signed at the last Steering Board meeting in June 2008. Continue the activity concerning the provision of MGNS for "BebiColombo" mission. Proceed the dialogue between Russian and European scientists to participate in the ESA Cosmic Vision programme 2015-2025. Pursue discussions on possible cooperation on one of the proposed missions under this programme.
- Applied Space Science and Technology: Based on the successful definition and joint
 agreement by the Working Group on 10 Pilot Cases for cooperation in applied space
 technology for implementation from 2009 onwards, as well as on 3 topics for joint
 workshops in the coming period, facilitate and support the implementation work between
 the relevant Industries, Institutes and Research Organisations.
- Launch Systems: Major milestones having been achieved during 2008 in the implementation of the cooperation between the parties for the exploitation of the Soyuz launcher from Europe's Spaceport, in particular following the arrival of the Russian equipment to French Guiana in July 2008, the objective is now to proceed in line with planning in order to carry out the first launch before end 2009.
- Crew Space Transportation System: The work performed jointly by Roscosmos and ESA in 2007-2008 on crew transportation systems, with the support by European and Russian industry, has led to the understanding of the general architecture, to the trade-off and selection of vehicle concept. Even after converging to a single vehicle concept, there are differences in the selected technical solutions, which depend on the assumed operational scenario, and have led to the choice of developing independent systems. As a consequence, it is considering to extend the scope of the WG activities to include the joint preliminary definition of a post-ISS manned space flight scenarios, supporting human exploration missions and other applications. This will include, for example, the development of in-orbit large structures and their assembly techniques and development of robotic means, as well as atmospheric re-entry technologies and other issues as identified during the work. Moreover in the shorter term the WG activities could cover ISS complementary developments and research capabilities, joint scientific utilization of ISS and the medical aspects of crew training and support for long duration missions. On this basis it is proposed to rename the WG as "Human Spaceflight Programme" with the update mandate as described above. The Steering Board noted with satisfaction the conduct of a Seminar on Europe-Russia Space Cooperation, held on 17 March 2009 in Moscow and gathering about 180 participants from Russian space organisations, institutes and enterprises as well as from European agencies, institutions, enterprises and

embassies. The seminar provided an opportunity to inform about and discuss opportunities for future cooperation and mutual participation in European and Russian space programmes. At the seminar, the European Commission informed about the main parameters and procedures under the EU's 7th Framework Programme for Research and Development, while ESA and Roscosmos informed about their relevant programmes and instruments, including the relevant budgetary planning and allocations for international cooperation. The Parties reiterated their mutual commitment to make all necessary efforts to ensure financing of agreed actions under this Space Dialogue.

• The Parties agreed to hold the next Steering Board meeting in spring 2010 in Brussels. Done in Moscow, March 18, 2009

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THE WHITE HOUSE

Office of the Press Secretary

FOR IMMEDIATE RELEASE

April 1, 2009

Joint Statement by
Dmitriy A. Medvedev, President of the Russian Federation, and
Barack Obama, President of the United States of America,
Regarding Negotiations on Further Reductions in Strategic Offensive Arms

The President of the United States of America, Barack Obama, and the President of the Russian Federation, Dmitriy A. Medvedev, noted that the Treaty on the Reduction and Limitation of Strategic Offensive Arms (START Treaty), which expires in December 2009, has completely fulfilled its intended purpose and that the maximum levels for strategic offensive arms recorded in the Treaty were reached long ago. They have therefore decided to move further along the path of reducing and limiting strategic offensive arms in accordance with U.S. and Russian obligations under Article VI of the Treaty on the Non-Proliferation of Nuclear Weapons.

The Presidents decided to begin bilateral intergovernmental negotiations to work out a new, comprehensive, legally binding agreement on reducing and limiting strategic offensive arms to replace the START Treaty. The United States and the Russian Federation intend to conclude this agreement before the Treaty expires in December. In this connection, they instructed their delegations at the negotiations to proceed on basis of the following:

- The subject of the new agreement will be the reduction and limitation of strategic offensive arms;
- In the future agreement the Parties will seek to record levels of reductions in strategic offensive arms that will be lower than those in the 2002 Moscow Treaty on Strategic Offensive Reductions, which is currently in effect;
- The new agreement will mutually enhance the security of the Parties and predictability and stability in strategic offensive forces, and will include effective verification measures drawn from the experience of the Parties in implementing the START Treaty.

They directed their negotiators to report on progress achieved in working out the new agreement by July 2009.

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AGREEMENT BETWEEN THE GOVERNMENT OF THE UNITED STATES OF AMERICA AND THE GOVERNMENT OF THE REPUBLIC OF INDIA

ON TECHNOLOGY SAFEGUARDS
AT ALL FACILITIES UNDER THE JURISDICTION AND/OR CONTROL OF
THE GOVERNMENT OF THE REPUBLIC OF INDIA ASSOCIATED WITH THE
LAUNCH OF U.S. LICENSED SPACECRAFT

The Government of the United States of America and the Government of the Republic of India (hereinafter referred to as "the Parties"),

RECOGNIZING the deepening nature of the strategic partnership between the United States and the Republic of India, and significant advances in cooperation in civil space activities that have occurred recently between the two countries, and the likelihood that this cooperation will continue to expand in the future, and

DESIRING to build further on that cooperation, and to continue to promote their mutual interests in protecting advanced technologies with respect to international projects of cooperation in space launches from all facilities under the jurisdiction and/or control of the Government of Republic of India,

HAVE AGREED as follows:

Article 1 Purpose & Scope

- 1.1 This Agreement is entered into for the purpose of facilitating the launching of U.S. licensed Spacecraft from all facilities under the jurisdiction and/or control of the Government of Republic of India and safeguarding protected technologies of either Party associated with such a launch.
- 1.2. This Agreement shall not apply to Spacecraft of the Government of the United States of America.

Article 2 Definitions

For the purposes of this Agreement, the following definitions shall apply:

- 2.1 "Spacecraft" means any spacecraft, groups of spacecraft, spacecraft systems or subsystems, spacecraft components (including satellites, groups of satellites, satellite systems or subsystems, and/or satellite components), and/or orbital transfer motors authorized for export by the Government of the United States of America and used to carry out Launch Activities.
- 2.2 "Launch Vehicles" means any launch vehicles, boosters, adapters with separation systems, payload nose fairings, and/or components thereof controlled, by India or Indian entities and used to carry out Launch Activities.
- 2.3 "Related Equipment' means support equipment, ancillary items, components and spare parts thereof required to carry out Launch Activities.
- 2.4 "Technical Data" means information, in any form, including in oral form, other than publicly available information, that is required for the design, engineering, development, production, processing, manufacture, use, operation, overhaul, repair, maintenance, modification, enhancement or modernization of Spacecraft and U.S. Related Equipment (hereinaster "U.S. Technical Data"), and information in any form, including in oral form, other than publicly available information, that is required for the design, engineering, development, production, processing, manufacture, use, operation, overhaul, repair, maintenance, modification, enhancement or modernization of Launch Vehicles and Indian Related Equipment (hereinaster "Indian Technical Data"). Such information includes, but is not limited to, information in the form of blueprints, drawings, photographs, video materials, plans, instructions, computer software, and documentation.
- 2.5 "Launch Activities" means all actions associated with the launching of Spacecraft by means of Launch Vehicles, from the initial technical discussions through launch and return of the U.S. Related Equipment and U.S. Technical Data from India to the United States of America or other location approved by the Government of the United States of America, and, in the event of a canceled or failed launch, the return of Spacecraft, U.S. Related Equipment, U.S. Technical Data, and/or any discovered and identified Spacecraft components and/or debris to the United States of America or other location approved by the United States Government; and return of Launch Vehicles, Indian Related Equipment

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and Indian Technical Data from the United States of America to India or other location approved by the Government of Republic of India.

- 2.6 "Technology Security Plan" means a plan developed jointly by the U.S. Consignees and the Indian Consignees in accordance with Article 5 of this Agreement, with, if necessary, the participation of persons of third states or representatives of international organizations using Spacecraft licensed for export by the United States of America or Launch Vehicles licensed for export by India or whose export is otherwise authorized by the Government of Republic of India, which are approved by the relevant agencies of the Government of the United States of America and the Government of Republic of India before delivery of Spacecraft to the territory of the Republic of India, and which outline security measures to be implemented during Launch Activities, including in emergency situations.
- 2.7 "U.S. Participants" means any U.S. Consignees, their contractors, subcontractors, employees or agents, whether persons of the United States of America or other persons, or any Government of the United States of America officials or contractors, subcontractors, employees, or agents, whether persons of the United States of America or other persons, who, in connection with the issuance of a U.S. export license, participate in Launch Activities, and are subject to the jurisdiction and/or control of the United States of America, as well as persons of third states or representatives of international organizations that use Spacecraft and, in connection with the issuance of a U.S. export license, participate in Launch Activities.
- 2.8 "Indian Representatives" means any persons (including but not limited to Indian Consignees, their contractors, subcontractors, employees or agents), other than U.S. Participants, whether persons of the Republic of India or other persons, who are authorized to have access to Spacecraft, U.S. Related Equipment, and/or U.S. Technical Data, who are subject to the jurisdiction and/or control of India.
- 2.9 "U.S. Consignees" means any person or persons issued (an) export license(s) pursuant to U.S. laws and regulations to export Spacecraft, U.S. Related Equipment, and/or U.S. Technical Data to India.
- 2.10 "Indian Consignees" means any person or persons authorized under the laws and regulations of the Republic of India to carry out Launch Activities and who are identified on the relevant U.S.-issued export license(s).
- 2.11 "Launch Related Facilities" means any facility under the jurisdiction and/or control of the Government of Republic of India associated with the launch of U.S. licensed Spacecraft, including "launch pad" and "technical complexes".

Article 3 General Provisions

3.1 This Agreement specifies the technology safeguards procedures to be followed for launches of Spacecraft, including procedures for controlling access to Spacecraft, Launch Vehicles, Related Equipment, Technical Data, and Launch Related Facilities. This Agreement shall apply to all phases of Launch Activities, including activities at all facilities of the U.S.

Consignees, activities at Launch Related Facilities and activities of Indian Representatives and U.S. Participants. This Agreement also shall apply to all phases of transportation of Spacecraft, U.S. Related Equipment, and/or U.S. Technical Data.

- 3.2 Except as described in Article 4 and in Article 8.3 of this Agreement, or as authorized in advance by export licenses issued by the Government of the United States of America, or as otherwise authorized in advance by the Government of the United States of America, the Government of Republic of India shall take all necessary measures to prevent unescorted or unmonitored access, including through any technical means, by Indian Representatives to Spacecraft, U.S. Related Equipment and/or U.S. Technical Data.
- 3.3 Except as described in Article 4 and in Article 8.3 of this Agreement, or as authorized in advance by the Government of Republic of India, the Government of the United States of America shall take all necessary measures to prevent unescerted or unmonitered access, including through any technical means, by U.S. Participants to Launch Vehicles, launch pads and technical complexes, Indian Related Equipment and/or Indian Technical Data.
- 3.4 For any Launch Activities, the Parties shall take all necessary measures to ensure that:
 - 3.4.1 Indian Representatives retain control of Launch Vehicles, launch pads and technical complexes, Indian Related Equipment and Indian Technical Data, unless otherwise authorized by the Government of Republic of India; and that
 - 3.4.2 U.S. Participants retain control of Spacecraft, U.S. Related Equipment, and U.S. Technical Data, unless otherwise authorized by the Government of the United States of America.
- 3.5 For any launch covered by this Agreement, the Parties shall oversee and monitor implementation of Technology Security Plans.
- 3.6 Each Party shall ensure that all persons under its jurisdiction and/or control who participate in or otherwise have access to Launch Activities shall adhere to the procedures specified in this Agreement. In addition, the Government of Republic of India shall ensure that Indian Representatives comply with the obligations set forth in Technology Security Plans. The Government of the United States of America shall ensure that U.S. Participants comply with the obligations set forth in Technology Security Plans. In the event of conflict between the provisions of this Agreement and the provisions of any Technology Security Plans, the provisions of this Agreement shall prevail.
- 3.7.1 The Government of the United States of America shall use its best efforts to ensure continuity of the U.S. license(s) for the completion of Launch Activities. If the Government of the United States of America determines that any provision of this Agreement or Technology Security Plans for any Launch Activities may have been violated, it may suspend or revoke any export license(s) related to such launches.
- 3.7.2 In the event that any such export license(s) is (are) suspended or revoked, the Government of the United States of America shall promptly notify the Government of Republic of India and explain the reasons for its decision.

- 3.7.3 In the event the Government of the United States of America revokes its export license, the Government of Republic of India shall not interfere with and, if necessary, shall facilitate the expeditious return to the United States of America or other location approved by the Government of the United States of America, in accordance with the terms of such export license, of Spacecraft, U.S. Related Equipment, and U.S. Technical Data that were brought into the territory of the Republic of India.
- 3.7.4 In the event the Government of the United States of America revokes its export license, the Government of the United States of America shall not interfere with and, if necessary, shall facilitate the expeditious return to the Republic of India or other location approved by the Government of Republic of India, of Launch Vehicles, Indian Related Equipment, and Indian Technical Data that were brought into the territory of the United States of America.
- 3.7.5 Nothing in this Agreement shall restrict the authority of the Government of the United States of America to take any action with respect to export licensing consistent with the laws, regulations and policies of the United States of America.
- 3.8.1 The Government of Republic of India shall use its best efforts to ensure continuity of the Indian license(s) for completion of Launch Activities. If the Government of Republic of India determines that any provision of this Agreement, or Technology Security Plans for any Launch Activities may have been violated, it may suspend or revoke any license(s) related to such launches.
- 3.8.2 In the event that any such license(s) is (are) suspended or revoked, the Government of Republic of India shall promptly notify the Government of the United States of America and explain the reasons for its decision.
- 3.8.3 In the event the Government of Republic of India revokes its license, the Government of the United States of America shall not interfere with and, if necessary, shall facilitate the expeditious return to the Republic of India or other location approved by the Government of Republic of India of Launch Vehicles, Indian Related Equipment, and Indian Technical Data that were brought into the territory of the United States of America.
- 3.8.4 In the event the Government of Republic of India revokes its license, the Government of Republic of India shall not interfere with and, if necessary, shall facilitate the expeditious return to the United States of America or other location approved by the Government of the United States of America of Spacecraft, U.S. Related Equipment, and U.S. Technical Data that were brought into the territory of the Republic of India.
- 3.8.5 Nothing in this Agreement shall restrict the authority of the Government of Republic of India to take any action with respect to licensing consistent with the laws, regulations, and policies of India.

Article 4 Technical Data Authorized for Disclosure

4.1.1 Subject to U.S. export licenses and approvals, the Government of the United States of America shall authorize the U.S. Consignees to transmit

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only that U.S. Technical Data to the Government of Republic of India and/or Indian Representatives necessary to integrate the spacecraft with the launch vehicle, and to ensure the successful launch and insertion of the spacecraft into orbit. This Technical Data shall include but may not be limited to:

- 4.1.1.1 orbit parameters; launch window;
- 4.1.1.2 interface form, fit, and function technical data that describe mechanical and electrical mating parameters for attaching Spacecraft to Launch Vehicles;
- 4.1.1.3 dimensional values; mass; center of gravity; envelope type; dynamic loading; power usage and conditioning; interface adapter requirements;
- data pertaining to the existence or absence of devices and/or components using radioactive elements and/or ionizing, sonic, or electromagnetic radiation sources, on Spacecraft and/or U.S. Related Equipment;
- 4.1.1.5 . ecological data pertaining to explosion and fire safety and to the presence on Spacecraft of elements that are toxic or otherwise hazardous to human life and health or the environment;
- 4.1.1.6 propellant parameters; operating frequency plans, including telemetry, tracking, and control; safety system information; test data; separation characteristics; ground handling/test equipment and test/flight and launch schedules.
- 4.1.2 Requests for additional U.S. Technical Data must be directed to the Department of State of the United States of America in accordance with normal export license procedures.
- 4.1.3 This Agreement does not permit, and the Government of the United States of America shall prohibit, U.S. Participants from providing any assistance relating to the design, development, production, operation, maintenance, modification, enhancement, modernization, or repair of Launch Vehicles unless such assistance is specifically authorized by the Government of the United States of America and applicable export licenses are obtained. This Agreement does not permit the disclosure of any information related to U.S. launch vehicles, boosters, adapters with separation systems, payload nose fairings, and/or components thereof by U.S. Participants or any U.S. persons.
- 4.2.1 The Government of Republic of India shall authorize the Indian Consignces to transmit to the Government of the United States of America and to U.S. Participants only the Indian Technical Data necessary to integrate the spacecraft with the launch vehicle, and to ensure the successful launch and insertion of the spacecraft into orbit.
- 4.2.2 The specific list and volume of Indian Technical Data to be transmitted shall be subject to approval by the authorized agencies of the Government of Republic of India designated in accordance with Article 9 of this Agreement.
- 4.2.3 Requests for the transfer of additional Indian Technical Data must be directed to the Government of Republic of India through the authorized agencies of the Government of Republic of India designated in accordance with Article 9 of this Agreement.

- 4.2.4 This Agreement does not permit, and the Government of Republic of India shall prohibit, Indian Representatives from providing any assistance relating to the design, development, production, operation, maintenance, modification, enhancement, modernization, or repair of Spacecraft unless such assistance is specially authorized by the Government of Republic of India. This Agreement does not permit the disclosure of any information related to Indian spacecraft, groups of spacecraft, spacecraft systems or subsystems, spacecraft components (including satellites, groups of satellites, satellite systems or subsystems, and/or satellite components), and/or orbital transfer motors by Indian Representatives and/or any persons of the Republic of India.
- 4.3.1 The Government of Republic of India shall not retransfer and shall prohibit the retransfer by Indian Representatives of any U.S. Technical Data referred to in paragraph 4.1.1 of this Article without the prior written approval of the Government of the United States of America. The Government of Republic of India shall not use and shall take the necessary measures to ensure that Indian Representatives do not use U.S. Technical Data for purposes other than purposes specified in the U.S. license information and/or Government of the United States of America retransfer authorization information provided by the U.S. Consignees to the Indian Consignees.
- 4.3.2 The Government of the United States of America shall take the necessary measures to ensure that the U.S. Consignees provide the Indian Consignees with the necessary information from the U.S. license and/or Government of the United States of America retransfer authorization. The Government of Republic of India shall take the necessary measures to ensure that the Indian Consignees provide the Government of Republic of India with the aforementioned information.
- 4.4.1 The Government of the United States of America shall not retransfer and shall prohibit the retransfer by U.S. Participants of any Indian Technical Data referred to in paragraph 4.2.1 of this Article without the prior written approval of the Government of Republic of India. The Government of the United States of America shall not use and shall take the necessary measures to ensure that U.S. Participants do not use Indian Technical Data for purposes other than purposes specified in the Indian license information and/or information from other relevant Indian Government authorizations, which is provided by the Indian Consignees to the U.S. Consignees.
- 4.4.2 The Government of Republic of India shall take the necessary measures to ensure that the Indian Consignees provide the U.S. Consignees with the necessary information from the Indian licenses and/or information from other relevant Indian Government authorizations. The Government of the United States of America shall take the necessary measures to ensure that the U.S. Consignees provide the Government of the United States of America with the aforementioned information.

Article 5 Technology Security Plans

5.1 The Parties shall, in accordance with their respective national laws and regulations, take measures to ensure that a Technology Security Plan, is developed and implemented to prevent unauthorized transfer of

technologies. The Technology Security Plan shall include, but not be limited to, provisions addressing the following:

- 5.1.1 Access controls related to specific launch activities;
- 5.1.2 Technology or data authorized for disclosure;
- 5.1.3 Emergency action plans;
- 5.1.4 Procedures to be followed in the event of delay, cancellation or failure; and
- 5.1.5 Where monitoring is identified and/or required by the laws and regulations of the Government of the United States of America, monitoring of the U.S. Consignees' conduct by U.S. Government representatives, including timely access to all locations where U.S. Consignees conduct singular or joint activities under this Agreement.

Article 6 Access Controls

- 6.1 The Government of Republic of India shall permit and facilitate oversight and monitoring of Launch Activities by the Government of the United States of America under the conditions stipulated by this Agreement.
- 6.2 The Parties shall ensure that only those U.S. Participants whose authority to apply technology safeguards procedures has been approved by the Government of the United States of America, shall, on a 24-hour basis, control access to Spacecraft, U.S. Related Equipment, and U.S. Technical. Data, throughout Spacecraft transportation, launch preparations, mating/demating, test and checkout, Spacecraft launch, and return of U.S. Related Equipment and U.S. Technical Data to the United States of America or other location approved by the Government of the United States of America.
- Officials of the Government of the United States of America present at all Launch Related Facilities in connection with Launch Activities shall have unimpeded access at all times to inspect Spacecraft and U.S. Related Equipment at facilities that are exclusively set aside for work with Spacecraft, and to check, at these facilities, the U.S. Technical Data that is provided by the U.S. Consignees to the Indian Representatives. The Government of the United States of America shall have the right to inspect and monitor, including electronically through a closed-circuit television system and other electronic devices compatible with conditions for preparation and launch of Launch Vehicles and compatible with launch safety requirements: all areas as set forth in the Technology Security Plans where U.S. Related Equipment and U.S. Technical Data are located, including the "especially clean" portion for working with Spacecraft after Spacecraft are mated with Launch Vehicles. The Government of the United States of America shall have the right to have U.S. Participants accompany Spacecraft along the route that Launch Vehicles with Spacecraft mounted on them may follow to launch pads. The Government of the United States of America shall take steps to ensure that the U.S. Consignees coordinate the specifications and technical characteristics of any electronic monitoring devices with Indian Consignees, and include such specifications and technical characteristics in the Technology Security Plans.
- 6.4 The Government of Republic of India shall give timely notice to the Government of the United States of America of any operations that may create a conflict between the access control and observation

requirements specified by the Parties so that suitable arrangements can be agreed to safeguard Spacecraft, U.S. Related Equipment, and U.S. Technical Data. The Government of Republic of India shall ensure that the U.S. Consignees' control of access to, and monitoring of Spacecraft, U.S. Related Equipment, and U.S. Technical Data are not denied, and that such control and verification are not interrupted at any time. The Government of the United States of America will undertake all available measures to prevent U.S. Participants from interfering with the launch preparations, harming launch safety requirements, and/or from acquiring Indian technologies and/or information and data not connected with Launch Activities, the transfer of which is not authorized by the Government of Republic of India.

6.5 Identification criteria and access to the premises and areas set aside exclusively for work with Spacecraft under the exclusive control of the Government of the United States of America, and identification criteria and access to areas, facilities, and premises at all Launch Related Facilities that are not set aside for work exclusively with Spacecraft, shall be determined in the Technology Security Plans as outlined in Article 5.

Article 7 Customs, Passport, and Spacecraft Processing Procedures

- 7.1 Spacecraft/Adapters Fit Check. The Government of the United States of America shall ensure that Indian Representatives are permitted access to Spacecraft only as needed for test validation of adapters and shall ensure that they are escorted and monitored at all times by only those U.S. Participants whose authority to apply security procedures has been approved by the Government of the United States of America.
- 7.2 Transportation of Spacecraft, U.S. Related Equipment, and U.S. Technical Data, including Customs Processing
 - 7.2.1 All transportation of Spacecraft, U.S. Related Equipment and U.S. Technical Data to or from the territory of India must be authorized in advance by the Government of the United States of America.
 - 7.2.2.1

Inspection by Indian Customs of any Spacecraft, U.S. Related Equipment, and/or U.S. Technical Data transported to or from the territory of the Republic of India and packed in appropriately scaled containers shall be conducted:

- with reasonable prior notice to the Government of the United States of America;
- in the presence of U.S. Participants, unless exigent circumstances arise;
- by means of visual and/or the least intrusive methods to avoid and minimize damage;
- taking into account the necessity of maintaining the physical integrity of sealed containers and their contents;
- so that transportation containers would be opened by a U.S. Participant in the presence of Indian Customs;
- in a timely fashion and on a priority basis, and in the presence of authorized representatives of the United States of America as part of inspection activities if

U.S. Participants or Indian Representatives make such a request.

- 7.2.2.2 The Parties shall require U.S. Consignees to provide written assurances that the sealed containers referred to in paragraph 7.2.2.1 of this Article do not contain any freight or equipment unrelated to Launch Activities.
- 7.2.2.3 The Government of the United States of America shall require the U.S. Consignees to obtain, in cooperation with the Indian Consignees and prior to entry of Spacecraft, U.S. Related Equipment and/or U.S. Technical Data into the territory of the Republic of India, authorization from the Government of Republic of India for the anticipated itinerary of Spacecraft, U.S. Related Equipment, and/or U.S. Technical Data, including any reloading points and/or, in the event that aircraft are used, intermediate landing points.
- 7.2.2.4 The Government of Republic of India shall ensure that customs control of goods that are intended for use in Launch Activities and that are moved through the customs frontier of India follow a simplified and priority procedure subject to the provisions of paragraph 7.2.2.1 of this Article. For the purposes of this paragraph, "goods" shall mean Spacecraft, and any other equipment required for a launch, including any article, natural or synthetic substance or material, any delivered or manufactured product, including monitoring and testing equipment, as well as technologies in the form of information recorded on material media, required for their development, production, or use. The category of information also includes other information expressed in any material form, such as:
 - computer software (including data bases);
 - commercial secrets and know-how, particularly production documentation and technical characteristics; and
 - research and development data.
- 7.2.4 In the event of an accident or crash of a vehicle transporting Spacecraft, U.S. Related Equipment, and/or U.S. Technical Data within the territory of the Republic of India, the provisions of Article 8 of this Agreement shall apply, as appropriate.
- 7.3 Transportation of Indian Equipment and Technical Data, including Customs Processing

The Government of the United States of America shall ensure that a simplified and priority procedure is followed for movement of Indian equipment, material and technical data which are required in connection with Launch Activities, to and from the territory of the United States of America and for import and export clearances as may be necessary.

7.4 Entry of U.S. Participants and Indian Representatives

U.S. Participants shall go through passport and customs control in India in accordance with the procedures defined by the laws and regulations of India. Indian Representatives shall go through passport and customs

control in the United States of America in accordance with the procedures defined by the laws and regulations of the United States of America.

- 7.4.1 The Government of Republic of India shall use its best efforts to facilitate the entry of U.S. Participants into the Republic of India for Launch Activities, including expediting appropriate visa processing for U.S. Participants.
- 7.4.2 The Government of the United States of America shall use its best efforts to facilitate the entry of Indian Representatives into the United States of America for Launch Activities, including expediting appropriate visa processing for Indian Representatives.

7.5 Preparations at Launch Related Facilities

- 7.5.1 The Government of Republic of India shall permit Indian Representatives to participate in unloading vehicles transporting Spacecraft, U.S. Related Equipment or U.S. Technical Data and delivering sealed containers to the Spacecraft preparation area at the technical complexes only if they are under the supervision of U.S. Participants. The Government of Republic of India shall not permit Indian Representatives access to such Spacecraft preparation areas for any purpose while Spacecraft or any U.S. Related Equipment is being tested and/or prepared for integration onto Launch Vehicles unless specially authorized by the Government of the United States of America.
- 7.5.2 Indian equipment shall be operated by Indian Representatives, except as otherwise agreed to by U.S. Participants and Indian Representatives.
- 7.5.3 The Parties shall permit only U.S. Participants to add propellant to Spacecraft and to test Spacecraft at the technical complexes. The Parties agree that Spacecraft and/or U.S. Related Equipment shall be accompanied by U.S. Participants during and after the integration of Spacecraft and Launch Vehicles and while Spacecraft, attached to Launch Vehicles, are being transferred to the launch pads.

7.6 Post-Launch Procedures.

The Parties shall ensure that only U.S. Participants are permitted to dismantle U.S. Related Equipment. The Parties shall ensure that such equipment, together with U.S. Technical Data, is returned to the United States of America or other location approved by the Government of the United States of America aboard vehicles approved by the Government of the United States of America.

Article 8 Launch Delay, Cancellation or Failure

8.1 Launch Delay.

In the event of a launch delay, the Parties shall ensure that access to Spacecraft, U.S. Related Equipment, and/or U.S. Technical Data is monitored by U.S. Participants. The Government of Republic of India shall ensure that U.S. Participants are present if Spacecraft are exposed or are removed from Launch Vehicles after such Spacecraft have been

mated to Launch Vehicles. The Parties shall ensure that such Spacecraft are monitored and accompanied by U.S. Participants from the launch pads, throughout the transport route to the Spacecraft preparation area, where, if need be, Spacecraft shall be repaired and await remating to Launch Vehicles. The provisions of Article 6 of this Agreement shall apply to any subsequent Launch Activities.

8.2 Launch Cancellation.

In the event of a launch cancellation, the Parties shall ensure that U.S. Participants are permitted to monitor access to Spacecraft, U.S. Related Equipment, and/or U.S. Technical Data. The Government of Republic of India shall ensure that U.S. Participants are present if Spacecraft are exposed or are removed from Launch Vehicles after such Spacecraft have been mated to Launch Vehicles. The Government of Republic of India shall ensure that Spacecraft shall be monitored and accompanied by U.S. Participants from the launch pads throughout the transport route to the Spacecraft preparation area, where they will await return to the United States of America or other location approved by the Government of the United States of America. The Parties shall ensure that the loading of Spacecraft, U.S. Related Equipment and/or U.S. Technical Data onto a vehicle is monitored by U.S. Participants, and that the vehicle is approved by the Government of the United States of America.

8.3 Launch Failure

- 8.3.1 In the event of a launch failure, the Government of Republic of India shall permit U.S. Participants to assist in the search for and recovery of any and all Spacecraft components and/or debris from all accident sites in locations subject to the jurisdiction or control of India in accordance with the safety procedures at the launch complex and the purposes of the Technology Security Plan. The Government of Republic of India shall ensure that U.S. Government emergency search personnel have access to the accident site. If there is reason to believe that the search and recovery of Spacecraft components and/or debris will affect the interests of a third state, the Parties shall consult expeditiously with the government of that state regarding the coordination of procedures for conducting search operations, without prejudice to the rights and obligations of all concerned states existing under international law, including those arising out of the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space of April 22, 1968.
- 8.3.2 The Government of Republic of India shall identify location(s), to be agreed to by the Parties, for the storage of identified Spacecraft components and/or debris, and the Government of Republic of India shall make these locations available to the U.S. Participants to be controlled in accordance with Article 6 of this Agreement. The Government of Republic of India shall ensure the immediate return of all identified Spacecraft components and/or debris recovered by Indian Representatives to U.S. Participants without such components or debris being studied or photographed in any way.
- 8.3.3 The Government of the United States of America and the Government of Republic of India agree to authorize the U.S. Consignees and Indian Consignees respectively, through licenses or permits, to provide, to the extent the national laws, security

interests and foreign policy of the respective states permit, information necessary to determine the cause of the accident.

Article 9 Implementation

- 9.1 In order to facilitate proper implementation of this Agreement and the accomplishment of its objectives, each Party shall designate authorized agencies to carry out its obligations under this Agreement:
 - 9.1.1 The Government of the United States of America hereby designates the Department of State and the Department of Defense as its authorized agencies.
 - 9.1.2 The Government of Republic of India hereby designates the Indian Space Research Organisation as its authorised agency;
- 9.2 A Party may change the designation of its designated authorized agencies by written notice to the other Party through diplomatic channels.
- 9.3 Any dispute between the Parties regarding the interpretation and implementation of this Agreement shall be resolved by consultation through diplomatic channels.

Article 10 Relation to Other Agreements

Cooperation under this Agreement shall take place without prejudice to the Partics' fulfillment of obligations under other international agreements to which they are a party.

Article 11 Special Arrangements

For launches that include additional payloads to which this Agreement does not apply, the procedures for applying the provisions of this Agreement, in particular any necessary amendments and/or supplements to this Agreement with respect to procedures for preparing Spacecraft at the technical complexes, integration with Launch Vehicles, and work at the launch pads, shall be agreed upon, if requested by any Party or its authorized agencies designated in accordance with Article 9 of this Agreement, and shall be included in the applicable Technology Security Plans in accordance with Article 5 of this Agreement.

Article 12 Entry into Force, Duration, and Termination

- 12.1 This Agreement shall enter into force on the date of signature and shall remain in force for a period of five years.
- 12.2 This Agreement may be amended and/or extended by written agreement between the Parties.

- 12.3 This Agreement may be terminated by either Party upon the expiration of three months from the date of the written notification indicating its intention to terminate this Agreement.
- 12.4 The obligations of the Parties set forth in this Agreement concerning security, disclosure and use of information, and return of Spacecraft, U.S. Related Equipment, and/or U.S. Technical Data from a delayed or canceled launch, or Spacecraft components and/or debris resulting from a failed launch to the United States of America or other location approved by the Government of the United States of America, and concerning the return to the Republic of India or other location approved by the Government of Republic of India of Launch Vehicles, Indian Related Equipment, and Indian Technical Data owing, inter alia, to a delayed launch, canceled launch, or failed launch, shall continue to apply after the expiration or termination of this Agreement.

IN WITNESS WHEREOF, the undersigned, being duly authorized thereto by their respective Governments, have signed this Agreement.

DONE at New Delhi this (date) day of (month), (year), in two originals each in the English and Hindi languages, both texts being authentic. In case of divergence in interpretation of the provisions of this Agreement, the English version shall prevail.

For the Government of the United States of America

A. Peter Burleigh
Chargé d'Affaires a.i.
Embassy of the United States
of America

For the Government of the Republic of India

A. Bhaskaranarayana Scientific Secretary Indian Space Research Organization

Embassy of the United States of America



New Delhi, India

July 20, 2009

Dear Mr. Bhaskaranarayana:

I have the honor to refer to discussions between representatives of our two governments in the course of the negotiation of the Agreement Between the Government of the United States of America and the Government of the Republic of India on Technology Safeguards at All Facilities under the Jurisdiction and/or Control of the Government of the Republic of India Associated with the Launch of U.S. Licensed Spacecraft ("the Technology Safeguards Agreement" or "TSA"). Based on those discussions, the Government of the United States of America proposes the following understandings with regard to the launch of spacecraft by India:

- Upon entry into force of the Technology Safeguards Agreement, the United States will grant export licenses, as appropriate, for spacecraft for non-commercial purposes for launch by India.
- Upon entry into force of a Commercial Space Launch Agreement (CSLA) between the United States and India, and in accordance with the terms of the TSA, the United States will consider and as appropriate grant export licenses for commercial spacecraft for launch by India.
- The United States and India will initiate and sustain consultations with a view to reviewing conditions in the market for commercial space launch services until such time as a CSLA is signed. During the period in which consultations are underway, the United States may decide to grant export licenses for commercial spacecraft for launch by India without the entry into force of a CSLA if the U.S. Government determines that government involvement in the Indian market for satellite launch services does not distort the conditions of competition in a manner that favors government suppliers of launch services.

Mr. A. Bhaskaranarayana
Scientific Secretary,
Indian Space Research Organization (ISRO),
Bangalore.

¹ For purposes of this note, "spacecraft" has the same meaning as in paragraphs 1.2 and 2.1 of the TSA

 As set out in paragraph 3.7.5 of the Technology Safeguards Agreement, in determining whether grant of an export license is appropriate, nothing in the TSA will restrict the authority of the United States to take any action with respect to export licensing consistent with the laws, regulations, and policies of the United States.

The Government of the United States of America further proposes the following understanding:

 Satellite transmission services are a separate service, distinct from spacecraft launch services. The United States and India will hold regular consultations on conditions affecting access to the Indian and U.S. satellite transmission services markets.

If the proposed understandings contained in this letter are acceptable to the Government of the Republic of India, this letter, together with your affirmative letter in reply, shall constitute an agreed understanding between our two governments that shall enter into force on the date of your letter.

Sincerely,

A. Peter Burleigh (Chargé d'Affaires a.i.

Space Law: Selected Documents 2009, vol. 2





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Indian Space Research Organisation
Department of Space
Government of India
Antariksh Bhavan
New BEL Road, Bangalore - 560 094, India
ব্যাস/Telephone : +91-80-2341 5474

फैक्स / Fax:

Ref:ISRO:SS:IC-31(TSA)

Excellency,

20 July, 2009

I have the honour to acknowledge the receipt of your letter dated 20 July, 2009 which refer to discussions between representatives of the Government of Republic of India and the Government of United States of America in the course of the negotiations of the agreement between the Government of the United States of America and the Government of the Republic of India on Technology Safeguards at All Facilities under the Jurisdiction and/or Control of the Government of the Republic of India Associated with the Launch of U.S. Licensed Spacecraft ("the Technology Safeguards Agreement" or "TSA") and which reads as follows:

"I have the honor to refer to discussions between representatives of our two governments in the course of the negotiation of the Agreement Between the Government of the United States of America and the Government of the Republic of India on Technology Safeguards at All Facilities under the Jurisdiction and/or Control of the Government of the Republic of India Associated with the Launch of U.S. Licensed Spacecraft ("the Technology Safeguards Agreement" or "TSA"). Based on those discussions, the Government of the United States of America proposes the following understandings with regard to the launch of spacecraft by India:

- Upon entry into force of the Technology Safeguards Agreement, the United States will grant export licenses, as appropriate, for spacecraft for non-commercial purposes for launch by India.
- Upon entry into force of a Commercial Space Launch Agreement (CSLA) between the United States and India, and in accordance with

भारतीय अन्तरिक्ष अनुसंधान संगठन Indian Space Research Organisation

¹ For purposes of this note, "spacecraft" has the same meaning as in paragraphs 1.2 and 2.1 of the TSA.

the terms of the TSA, the United States will consider and as appropriate grant export licenses for commercial spacecraft for launch by India.

- The United States and India will initiate and sustain consultations with a view to reviewing conditions in the market for commercial space launch services until such time as a CSLA is signed. During the period in which consultations are underway, the United States may decide to grant export licenses for commercial spacecraft for launch by India without the entry into force of a CSLA if the U.S. Government determines that government involvement in the Indian market for satellite launch services does not distort the conditions of competition in a manner that favors government suppliers of launch services.
- As set out in paragraph 3.7.5 of the Technology Safeguards Agreement, in determining whether grant of an export license is appropriate, nothing in the TSA will restrict the authority of the United States to take any action with respect to export licensing consistent with the laws, regulations, and policies of the United States.

The Government of the United States of America further proposes the following understanding:

 Satellite transmission services are a separate service, distinct from spacecraft launch services. The United States and India will hold regular consultations on conditions affecting access to the Indian and U.S. satellite transmission services markets.

If the proposed understandings contained in this letter are acceptable to the Government of the Republic of India, this letter, together with your affirmative letter in reply, shall constitute an agreed understanding between our two governments that shall enter into force on the date of your letter."

I have the honour to inform Your Excellency that the Government of Republic of India accepts the proposed understandings contained in your letter, and to confirm that your letter and this affirmative letter in reply shall constitute an agreed understanding between our two Governments that shall enter into force on the date of this letter.

Sincerely,

(A. Bhaskaranarayana)

H.E. A. Peter Burleigh Charge d' Affaires a.i. Embassy of the United States of America New Delhi



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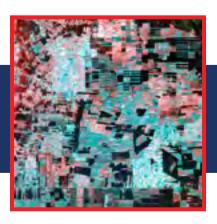
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Selected bills and legislation

- H.R. 6063: National Aeronautics and Space Administration Authorization Act of 2008
- S. 3001: Duncan Hunter National Defense Authorization Act for Fiscal Year 2009
- H.R. 6984: Federal Aviation Administration Extension Act of 2008

Selected interviews

- Mike Gold Corporate Counsel, Bigalow Aerospace
- Tracey L. Knutson Attorney, Knutson & Associates
- Glenn H. Reynolds Professor of Law, University of Tennessee College of Law

Selected primary sources

- Hearing: China's Proliferation Practices, and the Development of its Cyber and Space Warfare Capabilities
- Conference on Disarmament Statements
- Statement of Intent Regarding the International Lunar Network

Selected guest bloggers

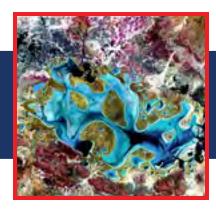
- Hiroshi Kiyohara Chief Attorney, Musashi International Law Offices
- Col. M.V. "Coyote" Smith United States Air Force
- Parviz Tarikhi Department Head,
 Mahdasht Satellite Recieving Station

Selected court cases

- Enomoto v. Space Adventures
- Ladman Partners Inc. v, Globalstar Inc.
- Bowe v. Worldwide Flight Services
- Ary v. United States
- American Air Transport Association of America v. Cuomo

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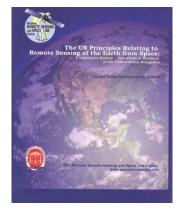
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The Land Remote Sensing Laws and Policies of National Governments: A Global Survey - available free online

