Committee on the Peaceful Uses of Outer Space

Fifty-seventh session

Script

684th Meeting
Tuesday, 17 June 2014, 3.00 p.m.
Vienna

Chairman: Mr. D. Stacey Moreno (Ecuador)

The meeting was called to order at 3.06 p.m.

Mr. D. STACEY MORENO (First Vice Chairman) *(interpretation from Spanish)*: Good afternoon distinguished delegates. *(Continued in English)* I now declare open the 684th meeting of the Committee on the Peaceful Uses of Outer Space.

I wish to first inform all delegates that Mr. Oussedik, Chairman of the Committee on the Peaceful Uses of Outer Space, was unexpectedly called elsewhere and has asked me to step in as First
Vice-Chairman. I hope we will have a quiet afternoon.

Distinguished delegates, I would like to inform you of our programme of work for this afternoon.

We will continue our consideration of agenda item 11, Space and Water, and agenda item 12, Space and Climate Change. We will also begin our consideration of agenda item 13, Use of Space Technology in the United Nations System.

There will be three technical presentations this afternoon, by a representative of Canada, entitled “Space Security Index 2014”, by a representative of Italy entitled “Use of Earth Observation Data for Emergency Management and Situation Awareness”, and by a representative of the Russian Federation entitled “The Effect of the Criterion Value of Single Entry Interference on the Efficiency of Use of the Geostationary Satellite Orbit Resource”.

The Working Group on the Long-Term Sustainability of Outer Space Activities will then hold its third meeting.

The provisional list of participants was distributed yesterday morning through the pigeonholes as Conference Room Paper 2. Delegations are kindly requested to provide the Secretariat with written amendments to the list by close of business today, Tuesday, 17 June, so that the Secretariat can finalize it.

Delegates are also reminded that there will be a reception hosted by the United States, starting at 6.00 p.m. in the Coffee Corner outside Board Room D.

Are there any questions on this proposed schedule?

I see none.

General exchange of views (agenda item 5)

Distinguished delegates, I have received a request from the observer for the European Space Policy Institute to make a statement under agenda item 5, General Exchange of Views.

With your permission, I now give the floor to the distinguished representative of ESPI.

You have the floor Sir.

Mr. P. HULSROJ (European Space Policy Institute): Thank you Mr. Chairman. Let me first of all congratulate you and the other Chairpersons of the Committee on your election and congratulate also the new Director of the Office for Outer Space Affairs for her appointment. We wish you all the best in the performance of these important duties now and in the future.

Now, Mr. Chairman, before I tell you about the ESPI activities, I have to unfortunately tell you about an activity we are not doing. So you might know that we have a tradition of arranging events coinciding with the meetings of the Subcommittees and of the plenary at our premises of the European Space Policy Institute at the Schwarzenbergplatz and we had lined up a very interesting event which I really would have hoped that you would have participated in next Thursday, so in two days, a podium discussion between the long-serving Chairman, the longest-ever serving Chairman of the COPUOS, Ambassador Peter Jankowitsch, who served for almost 20 years as the Chair of COPUOS, and Professor Yashpal, who was the Secretariat-General of UNISPACE II and a very well-known Indian science communicator, communicating science, particularly through the general public but also being a good friend of space in general. Unfortunately, Professor Yashpal, who is 87, had a health incident two days ago and he has not been able to make the trip from Delhi so we are sad that this could not come true. I think it would have been very good but I think that we also have to accept that it was an extraordinary effort by Professor Yashpal to make this trip to be with us and unfortunately then for reasons we can understand, it could not come about.

But then let me explain to you a little about what activities we are doing and what we have been doing.

Just a reminder, the European Space Policy Institute is the only Pan-European institute devoted to space policy studies and we try to embrace the whole diversity of the space policy field as perhaps I can illustrate by telling you which sort of studies we have issued since we saw each other last time. You will have found the reports, or some of you will have found the reports on the table outside, but all reports can also be accessed on our website.

We have issued five reports which are the In-Depth Analysis that we are doing of selected topics and we started out right after your last meeting with a study on the "Long-Term Record of Cooperation Between NOAA and the European Meteorological Satellite Organization, EUMETSAT". So a very geo-political study, I think of great interest, not only for space but also in a wide geo-political context. There are lessons to learn from how you build very stable cooperation structures through the ups and downs and how you make them robust for the future.

Then again to show the diversity of what we are doing, we have issued two studies on security-related issues. We have done one study on ESA enlargement where we are particularly looking at what interested States can do themselves in order to ultimately join the European Space Agency. So this you might say is not perhaps the most relevant study for this global forum but I have to say even if you are not an aspirant for membership of the European Space Agency, you might be interested in reading this report because we have tried to create a sort of toolbox of what States that want to have a stronger involvement in space, a toolbox for what they can do to facilitate such stronger involvement.

And then finally, and I will spend a little bit of time on this, we have issued a report on humanitarian tele-medicine. Some of you might have been present during the Scientific and Technical Subcommittee in February where we made a specific presentation and this as a technical presentation. And we have followed up on this by also presenting this initiative at the UN-Space in New York in May and I was also very pleased to be given the opportunity at a High-Level Meeting called by the President of the General Assembly, also in May, to present this under the heading of "What ICT Can Do in Order to Assist the Post-2015 Development Agenda".

So just as a reminder, humanitarian tele-medicine, we understand as using the tele-medicine tool to connect ultimately with very under-served regions in terms of medical care, with reachings where there are lots of doctors who might be ready to assist even if they cannot assist physically but only do something a couple of hours a week by using the tele-medicine tool which ultimately makes distance irrelevant. We are very motivated on this and we will ultimately have an in-depth conference on this hopefully by the end of this year and we might also try to put in place a prototype of this idea. What is motivating us, and I do not want to sound too sanctimonious here, what is motivating us is how many lives are lost for the simplest possible reasons that somebody in rural Africa in an under-served region of the world has diarrhoea and is not told there is a simple supplement to take in order to stop this and death is a result. This is something that we must avoid and the humanitarian tele-medicine might be one small tool to try to limit this sort of tragedy.

So, Mr. Chairman, what are we doing in the next period? What can you expect me to talk to you about in a year's time? We are doing a study again of a geo-political nature where we are looking at the geo-political consequences of China potentially putting a person on the Moon. So we are looking at really what are the cooperation opportunities from this if this is not possible, would this be the start of a new space race, etc. But we are certainly particularly looking at how this can be instrumentalized in a fashion which is serving the full space community as China is also always stressing when they talk about the human exploration activities.

And then again showing the diversity of what we are doing. We are looking at the future of commercial spacecraft manufacturing in European so we understand that there are issues which have also presented themselves to European, let us say, car manufacturing, that it might be much cheaper to produce parts of commercial satellites elsewhere than in Europe. Does that mean that Europe is out of the game or is there a way of sharing work in this? And then again, showing the diversity, and we will be looking at the European Union and how they are creating norms also under the new mandate on space under the Lisbon Treaty, creating norms that might also be relevant for space, perhaps not only actually for European space because European space is, of course, integrated in the global endeavour.

And then finally, and this might also be relevant for those of you who are strongly interested in the sustainability issue which you are discussing currently, we are looking at how to organize in the best possible fashion use of communities in the Earth observation domain. So, yes, the focus is particularly on how we organize use of communities in Europe but also how we make that organization effective within the global framework of Earth observation because Earth observation is, of course, the definition of global activity.

So, Mr. Chairman, I hope I have given you a good overview of what we are doing. I repeat that most of our research you can find free of charge on our website. What we hope is that those of you who have been involved with ESPI in the past will remain involved and those of you who did not will become good friends of ESPI, that you will exploit our resources, that you will become proactive partners for us.

Thank you very much.

FIRST VICE CHAIRMAN: I thank the representative of ESPI for his statement and we regret that this very important panel will not take place at this opportunity and please convey our feelings to Professor Yashpal and hopefully next year we will have him back here.

We have, therefore, concluded our consideration of agenda item 5, General Exchange of Views.

Space and water (agenda item 11)

Distinguished delegates, I would like now to continue our consideration of agenda item 11, Space and Water.

Is someone wishing to take the floor?

I see none.

We will, therefore, continue and hopefully conclude our consideration of agenda item 11, Space and Water, tomorrow morning.

Space and climate change (agenda item 12)

Distinguished delegates, I would now like to continue our consideration of agenda item 12, Space and Climate Change.

The first speaker on my list is the distinguished delegate of Portugal, Mr. Filipe Duarte Santos.

You have the floor Sir.

Mr. F. DUARTE SANTOS (Portugal): Thank you Mr. Chairman. Mr. Chairman, distinguished delegates, climate change is one of the greatest challenges of the present time and a significant obstacle in the way to achieve sustainable development. It is a cross-cutting issue that is adversely affecting all regions of the world, although in differentiated ways, through a variety of processes, such as global warming, global sea-level rise, more intense weather and climate events, including droughts, extra-tropical storms, tropical cyclones and rain events, which lead to stronger floods and land-slides. Satellite observations and space-derived data, together with ground-based observations, are indispensable tools to track climate change and its impacts on bio-geophysical systems and socio-economic sectors. Space observations have been particularly important to monitor climate change impacts in the Polar Regions, global sea-level rise and the cloud cover. They are also very important to assess impacts on water resources, agriculture, forests, biodiversity, coastal zones, health, urban areas and infrastructure, among other sectors. Satellite data are also crucial in the development of international assessments such as the Fifth Assessment Report of the Intergovernmental Panel on Climate Change that was published this year.

Mr. Chairman, Portugal is promoting both adaptation and mitigation programmes and actions. It supports the activities in this field conducted by the Group on Earth Observation, the Global Earth Observation System of Systems and the global climate change and adaptation actions under the United Nations Framework Convention on Climate Change. Furthermore, it participates in ESA's Climate Change Initiative which is the largest programme providing data on key climate parameters to support the analysis of climate change from space.

Mr. Chairman, the Portuguese delegation believes that this Committee has a very important role to play as regards monitoring, impacts and adaptation to climate change using space applications. I emphasize adaptation because, although many countries have mitigation plans and programmes to reduce their greenhouse gas emissions to the atmosphere, the probability of levelling off the global emissions and starting to reduce them in the next two to three decades is very small. The main difficulty is changing our global energy consumption paradigm based mainly on fossil fuels.

To illustrate the challenges ahead let me mention some of the findings of an International Energy Agency Report published a few days ago, on 3 June. Global annual investment in renewable energies rose from 60 billion dollars in the year 2000 to a high point of close to 300 billion in 2011, but the investment is falling since that year. On the other hand, the global annual investment on fossil fuels increased systematically from 500 billion dollars in 2000 to more than 1,150 billion in 2013. The Report compares two future energy investment scenarios called "New Policies Scenario" and "450 Scenario", this "450" is a measure of the amount of greenhouse gases in the atmosphere. The latter scenario, the "450 Scenario", gives a 50 per cent chance that the increase in the global average temperature of the atmosphere compared to pre-industrial values does not go above 2ºC. It has already increased 0.85. The first scenario leads to higher temperatures and implies a global cumulative investment on the energy sector of 48 trillion dollars from 2013 up to 2035 and the second a larger investment of 53 trillion dollars. Both scenarios are very difficult to achieve. Thus, the likely energy investment path at the world level falls short of reaching climate stabilization goals since today's policies and markets are not strong enough to switch investment to low-carbon sources and energy efficiency at the necessary scale and speed. To change this outlook, we would probably need a breakthrough at the Paris United Nations Climate Conference in the fall of 2015.

This means that climate change is not likely to be controlled in the next 20 years, at least. We, therefore, need to devote more attention to adaptation to climate change in order to minimize its adverse impacts and take advantage of opportunities that it might also bring. The most vulnerable countries are those with a low adaptation capacity, especially those with a large population in low-lying coastal zones and/or with a large sharing of agriculture in economic output.

Mr. Chairman, distinguished delegates, space systems and applications can contribute decisively to adaptation to climate change. This Committee could contribute to strengthen the capacity of all countries in using space science and technology and space applications in areas related with monitoring the impacts and to reach adaptation to climate change in various systems and sectors. It could also increase the coherence and synergy in the space-related work of entities of the United Nations system that deal with climate change such as the United Nations Framework Convention on Climate Change, and the Intergovernmental Panel on Climate Change.

One area where this Committee could have a particularly useful role to play is on adaptation to climate change impacts on coastal zones and on marine and coastal ecosystems, including the effects of global sea-level rise, which is one of the most adverse and challenging long-term impacts. The topic of marine and coastal ecosystems has been mentioned in previous sessions of this Committee under the agenda item on space and sustainable development. And, in my opinion and the opinion of my delegation, this topic should be pursued. Countries that have a large coastal population living lower than five meters above average sea-level are particularly vulnerable to sea-level rise in the long-term, particularly if they are located in regions with high storm surges due to extra-tropical storms or tropical cyclones. My delegation believes that strengthening the capacity of all countries to use space applications and space data for climate change monitoring and assessment of impacts and for the development of adaptation, particularly in the most vulnerable sectors of water resources, agriculture, forests and coastal zones, is a very important goal and could be a relevant topic for the future role of the Committee.

Thank you, Mr. Chairman, for your attention.

FIRST VICE CHAIRMAN: I thank the distinguished representative of Portugal for his statement.

The next speaker on my list is the distinguished representative of India, Mr. Madhusudana.

Please, Sir, you have the floor.

Mr. H. N. MADHUSUDANA (India): Thank you Mr. Chairman. Climate change is one of the biggest concerns and the most challenging scientific issue as it requires understanding and predicting the complex and inter-dependent behaviour of the coupled Earth system, with human systems included. Space observations have provided critical information for understanding and modelling the Earth system and it would play a larger role as additional indicators of climate change are being documented. With a strong space-borne, air-borne and ground-based observation infrastructure, a large group of research institutions and academia are actively involved in climate change research in India.

The Indian delegation would like to brief this Committee on the activities carried out in India in the field of climate change studies.

Activities in India mainly focus on providing in-orbit sensors to monitor climate change indicators, observe critical Earth processes using Earth observation data, and explore their use in impact analysis and mitigation measures.

Mr. Chairman, the Himalayas possess one of the largest resources of snow and ice outside the polar region and are a critical water resource for the Indo-Gangetic Plains. In view of the potential of remote sensing for monitoring of snow and glaciers and the need for regular monitoring of this resource in the context of climate change scenarios, India has been carrying out a space-based inventory of the Himalayan glaciers, the retreat and advance of glaciers, seasonal snow cover and glacier mass balance. With the availability of new observation capabilities, studies on snow albedo, snowmelt prediction and aggregate mass through gravity change have been taken up. Space-based observation studies are being optimally supplemented with intensive field observations at selected sites.

Mr. Chairman, India participates in the United Nations Framework Convention on Climate Change, UNFCCC, and the United Nations Convention to Combat Desertification, UNCCD, and space-derived information forms a critical component of the report submitted by India to these fora. As a part of the UNCCD Thematic Programme Network, a nationwide inventory of desertification status at 1:500,000 scale using satellite data has been carried out. Currently, the second cycle of the inventory is being carried out to understand the trend in land degradation. Action plans are also being generated to combat desertification.

As the current global scientific focus is to improve the understanding on the role of aerosols in climate change, a National Research Programme on Aerosol Radiative Forcing over India, ARFI. has been taken up. Under this Programme, a nationwide aerosol observation network has been established and model parameterization and scientific analysis are being carried out. This has resulted in the generation of new primary data in a data-sparse region. More than a dozen publications from this Programme have been cited in the Fifth Assessment Report of the Intergovernmental Panel for Climate Change, IPCC. and are used in assessing the climate impact.

Additionally, research programmes addressing many other themes relevant to climate change studies such as the Indian terrestrial and ocean carbon cycle, boundary layer characterization, land surface process studies, chemistry of aerosols, land use and land cover change as well as paleoclimatic reconstruction of the Indian monsoon are being carried out for over a decade and have led to very large scientific database.

Mr. Chairman, efforts have also been made by India to improve the space assets for Earth monitoring, focusing on specific parameters at various spatial and temporal scales for addressing the issues related to climate change.

Megha-Tropiques, an ISRO-CNES joint satellite, is specially designed to study the life cycle of convective systems and their role in the associated energy and moisture budget of the atmosphere in the tropical regions.

OCEANSAT-2 satellite's, Ocean Colour Monitor sensor continues to provide the chlorophyll distribution and the OSCAT sensor has provided the wind vector data to the global community until March 2014.

A satellite with ARGOS and ALTIKA, SARAL, is another ISRO-CNES joint mission realized to provide data products to the scientific communities and support the studies in marine meteorology and ocean state forecasting, operational oceanography, seasonal forecasting, climate monitoring, ocean, Earth system and climate research.

The INSAT-3D satellite, launched in July 2013, has added a new dimension to weather monitoring through its atmospheric sounding system, which provides vertical profiles of temperature, humidity and integrated ozone from the surface to the top of the atmosphere. These profiles are available for a selected region over Indian landmass every one hour and for the entire Indian Ocean region every six hours. The improved imaging system enables night time imaging of low clouds, fog, estimation of sea surface temperature with better accuracy and acquisition of high spatial resolution images in the visible and thermal infrared bands.

As part of strengthening the ground infrastructure for the data collection of various *in situ* parameters for ground validation and modelling, a good number of Automatic Weather Stations, Aethalometers, AGROMET Towers, Doppler Weather Radars, Multi-Wavelength Radiometers, Boundary Layer LIDARs, Wind Profilers, GPS Sondes, to name a few, have been established in the country.

Mr. Chairman, in India, many Ministries, research institutions and academia are involved in the climate and environment research. An Indian Network of Climate Change Assessment Group. involving about 120 institutions in the country, is conceived to undertake scientific assessments of different aspects of climate change in four key sectors namely agriculture, water, natural ecosystem and biodiversity, and health in four climatic sensitive regions of India, namely, the Himalayan region, the Western Ghats, coastal areas and the north-eastern region.

Further, towards developing inter-departmental linkages and collaboration for information- and knowledge-sharing in the area of climate and environment studies, and also to extend policy level support, a National Information system on Climatic and Environmental Studies, NICES, has been set up. NICES envisages establishing a dedicated Information System for Climate and Environment Studies at national level using Indian remote sensing and geostationary satellites' data and others. Additionally, NICES will build specific observational networks, effectively coordinate among various departments and carry out climate and environmental impact assessment through formulation of a science plan.

Mr. Chairman, to conclude, the Indian delegation believes that the deliberations under this agenda item would go a long way in enhancing global cooperation in information-sharing and use of space technology in understanding and managing the challenge of climate change.

Thank you Mr. Chairman.

FIRST VICE-CHAIRMAN: I thank the distinguished representative of India for his statement.

Are there any other delegations wishing to make a statement under this agenda item at this time?

I see none.

We will, therefore, continue and hopefully conclude our consideration of agenda item 12, Space and Climate Change, tomorrow morning.

Use of space technology in the United Nations system (agenda item 13)

Distinguished delegates, I would now like to begin our consideration of agenda item 13, Use of Space Technology in the United Nations System.

The first speaker on my list is the distinguished delegate of Japan, Mr. Kazushi Kobata.

You have the floor Sir.

Mr. K. KOBATA (Japan): Thank you Mr. Chairman. Mr. Chairman, distinguished delegates, on behalf of the Japanese delegation, I am pleased to report on our activities on this agenda item.

Various space-based technologies have the potential to contribute to resolving many global issues faced by humanity today. Japan has been cooperating with the United Nations system in tackling these issues by utilizing space-based technologies. I would like to introduce some of our experiences in this regard.

JAXA contributes to activities of the United Nations Economic and Social Commission for Asia and the Pacific, or ESCAP, that address the most important development issues in Asia and the Pacific, such as disaster management, bridging the digital divide, water resource management and adaptation to climate change. In addition to the cooperation with Sentinel Asia, JAXA has also cooperated with ESCAP's Statistical Institute for Asia and the Pacific, or SIAP, by using the communications satellite KIZUNA to provide distance training for statistics experts in Mongolia.

We are also pleased to see that the proposal "Asia-Pacific Years of Action for Applications of Space Technology and Geographic Information System for Disaster Risk Reduction and Sustainable Development, 2012-2017", at ESCAP, during its sixty-ninth Commission session last year, is successfully being continued.

We look forward to working with many other member States in support of the Asia-Pacific Years of Action. Through these activities, Japan will actively take part in international efforts to strengthen disaster management support systems, keeping in mind the goal of achieving the GEOSS 10-Year Implementation Plan, and will also contribute to UNSPIDER.

I would like also to draw your attention to the Third United Nations World Conference on Disaster Risk Reduction, which will be held in March 2015, in Sendai, Japan, one of the regions that was damaged by the 2011 East Japan Great Earthquake and Tsunami. The World Conference will review the progress of the Hyogo Framework for Action 2005-2015 and develop the Post-2015 Framework for Action. Japan will make a significant contribution to the Conference to promote the application of space-based technologies and related services by using Sentinel-Asia as an example of regional framework. Japan would like to encourage all COPUOS member countries to endeavour to include the importance of space-system-based disaster management support into the Post-2015 Framework for Action.

Mr. Chairman, as I introduced yesterday, Japan organized a Seminar entitled "Space and Sustainable Development: Space Technology and Research for Global Health", in cooperation with the World Health Organization on the margins of the last Scientific and Technical Subcommittee. This year, WHO and JAXA will begin discussions on the development of a working plan for cooperation. Through these activities, Japan will continue to cooperate with the United Nations system by utilizing space-based technologies.

Thank you for your attention.

FIRST VICE-CHAIRMAN: I thank the distinguished representative of Japan for his statement.

The next speaker on my list is the distinguished Director of the United Nations Office for Outer Space Affairs, Ms. Simonetta Di Pippo.

Please, you have the floor.

Ms. S. DI PIPPO (Director, Office for Outer Space Affairs): Thank you Mr. Chair and distinguished delegates.

I am pleased to inform you that the thirty-fourth session of the United Nations Inter-Agency Meeting on Outer Space Activities was held from 13 to 14 May 2014 at the

Headquarters of the United Nations in New York. This was the first time when the Inter-Agency Meeting, the mechanism for coordination and cooperation in space-related activities among United Nations entities, was held under the name UN-Space, pursuant to the recommendation of the General Assembly contained in resolution A/RES/68/75.

Mr. Chair, distinguished delegates, the report of the thirty-fourth session of UN-Space is before you in document A/AC.105/1064. I will now highlight the results of the Meeting.

The Inter-Agency Meeting looked into the ways to further enhance coordination, cooperation and synergy within the United Nations system in planning and implementation of space-related activities and has adopted a flexible approach to its agenda setting in order to be more adaptive to present needs and interests of participating United Nations entities.

The Meeting decided to include in the agenda for its next session in 2015 an exchange of views and information on the report of the Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities, document (A/68/189), in line with the overall recommendations of the GGE as endorsed by the General Assembly in its resolution 68/50. The consideration of this item would be mainly of direct interest to such entities as the Office of Disarmament Affairs, ODA, the United Nations Institute for Disarmament Research, UNIDIR, the International Telecommunication Union, ITU, the World Meteorological Organization, WMO, and the Office for Outer Space Affairs, OOSA.

The Meeting also decided that the upcoming special report would address the theme of space and global health. Delegations will recall that the special reports of the Inter-Agency Meeting are generated biennially with a thematic approach. The focus on global health would be a valuable addition to the collection of previous special reports that covered “New and Emerging Technologies, Applications and Initiatives for Space-Related Inter-Agency Cooperation”, which was document (A/AC.105/843), “Space Benefits for Africa: Contribution of the United Nations System”, document (A/AC.105/941), “Use of Space Technology Within the United Nations System to Address Climate Change Issues”, document (A/AC.105/991), and “Space for Agriculture and Food Security”, document (A/AC.105/1042).

Mr. Chair, distinguished delegates, following its practice of promoting dialogue among United Nations entities, member States and other stakeholders, the eleventh open informal session was held on Wednesday, 14 May 2014, on the theme “Engaging Space Tools for Development on Earth: Contribution of Space Technology and Applications to the Post-2015 Development Agenda”.

The concluding discussion of the open informal session attracted discussion on the conceptual question on how to define a formula for the contribution of space technology applications to the global development agenda. I would like to request member States of the Committee to continue encouraging the participation of their representatives in the open informal sessions of UN-Space.

Taking advantage of the adjacency of the Inter-Agency Meeting with the fourteenth plenary meeting of the United Nations Geographic Information Working Group, UNGIWG, a joint UN-Space-UNGIWG meeting was organized in the afternoon of 14 May. The next session of UN-Space in 2015 could also be organized jointly with UNGIWG and/or the Secretariat of the United Nations Initiative on Global Geospatial Information Management, GGIM, or to be hosted by the Economic and Social Commission for Asia and the Pacific, ESCAP, in Bangkok, if held in conjunction with a meeting of the Commission involving its member States. The decision on the venue and timing will be taken in the intersessional period.

Mr. Chair, distinguished delegates, this year, the report of the Secretary-General on the coordination of space-related activities within the United Nations system for the period 2014-2015, one of the flagship outputs of the Inter-Agency Meeting, was prepared in the intersessional period. The report addresses the Post-2015 Development Agenda and provides an overview of current efforts by the contributing United Nations entities, including those efforts aimed at achieving environmental sustainability, inclusive social and economic development and promoting international cooperation in the peaceful uses of outer space.

An objective of the Secretary-General's report this year is also to assist the Committee in its considerations of the agenda item on "Space and Sustainable Development", and the Scientific and Technical Subcommittee in discussions on the role of space technology for socio-economic development in the context of the United Nations Conference on Sustainable Development and the Post-2015 Development Agenda. The report is before you in document A/AC.105/1063.

Mr. Chair, distinguished delegates,

I would like to conclude my statement by reminding delegations that the presentations made at the open informal session as well as reports and information on the current space-related activities of United Nations entities are available at the website dedicated to the coordination of outer space activities within the United Nations system.

Mr. Chair, distinguished delegates, last week, the Director-General of the United Nations Office at Vienna, Mr. Yury Fedotov, in his statement, has put a clear message. It is the time to make the overall governance of the peaceful uses of outer space an integral part of the international community's global commitments on sustainable development and to demonstrate to the international community the essential role of space in development, particularly within the context of the outcome of the Rio+20 Conference and the emerging Post-2015 Development Agenda. In this regard, the Office will do its best to ensure that UN-Space, through United Nations entities, promotes increased practical application of space technology for development and addresses the lack of awareness of space's catalytic role therein.

I thank you for your attention.

FIRST VICE-CHAIRMAN: I thank the distinguished Director of the United Nations Office for Outer Space Affairs for her statement.

Are there any other delegations wishing to make a statement under this agenda item at this time?

I see none.

We will, therefore, continue our consideration of agenda item 13, Use of Space Technology in the United Nations System, tomorrow morning.

Technical presentations

Distinguished delegates, I would now like to proceed with the technical presentations.

Presenters are kindly reminded that technical presentations should be limited to 15 minutes in length.

The first presentation on my list is by a representative of Canada entitled "Space Security Index 2014".

Please, you have the floor.

Mr. C. JARAMILLO (Canada) *(interpretation from Spanish)*: Thank you Mr. Chairman. *(Continued in English)* Thank you very much Mr. Chairman. I am very pleased to be at this very important forum to address a few issues related to outer space security and sustainability which is based on the research work that has been conducted for the Space Security Index Project. The Space Security Index Project partners consider these much needed discussions consistent with the type of collaborative, multilateral approach that is required for addressing the complex challenges facing the outer space domain.

The primary outcome of the Space Security Index Project is in the Annual Report of which the Space Security Index 2014, soon to be released, is the eleventh edition. The Space Security Index is the only report of its kind in the world that systematically tracks key trends and developments that may have an impact on the sustainability of outer space.

From search and rescue operations to weather forecasting, from banking to arms control treaty verification, the world has become increasingly reliant on outer space applications. The primary goals of the Space Security Index, therefore, are to improve transparency on space activities and to provide a common comprehensive knowledge base to support the development of national and international policies that contribute to the security and sustainability of outer space.

Although the research for the Space Security Index is conducted in a non-partisan fact-based and policy-neutral manner, the conceptual framework for our work is embodied in a specific definition of space security that we have developed. We understand space security as a secure and sustainable access to and use of space and freedom from space-based threats. The primary consideration in this definition is not the interest of particular national or commercial entities but the security and sustainability of outer space as an environment that can be used safely and responsibly by all. This broad definition encompasses the security of the unique outer space environment, the physical and operational integrity of man-made objects in space and their ground stations, as well as security on Earth from threats originating in space.

The inter-dependence, mutual vulnerabilities and synergies of various aspects of outer space activities are a testament not only to the multi-faceted challenges facing this domain, but of the increased reliance of humanity on outer space for a host of practical and wide-ranging applications. In this context, issues such as the threat posed by space debris, the priorities of national civil space programmes, the growing importance of the commercial space industry, efforts to develop a robust normative regime for space activities and concerns about the militarization and potential of weaponization of space remain critical.

The Space Security Index considers four broad themes in its report which are intended to reflect the close relationship among developments that may have an impact on the security and sustainability of outer space. The structure of the Space Security Index Report is, therefore, as follows.

Condition of the space environment is theme one, access to and use of space by various actors, theme two, security of space systems, theme three, and lastly, outer space policies and governance.

The first theme on the condition of the space environment covers indicators of space security related to such areas as orbital debris, radio-frequency spectrum, near-Earth objects, space weather, and space situational awareness.

With regard to the condition of the space environment, the most critical challenge to the security and sustainability of outer space continues to be the threat posed by space debris to spacecraft of all nations. The total amount of man-made space debris in orbit is growing each year, concentrated in the orbits where human activities take place. Today, the United States Department of Defence uses a space surveillance network to track more than 20,000 pieces of debris, 10 centimetres in diameter or larger. Experts estimate that there are over 300,000 objects with a diameter larger than one centimetre and there are several million that are smaller. There is a growing risk that space assets may collide with one another or with a piece or orbital debris. As outer space becomes more congested, the likelihood of such events increases, making all spacecraft vulnerable, regarding of the national entity to which they belong.

In recent years, awareness of the space debris problem has grown considerable and efforts to mitigate the production of new debris to compliance with national and international guidelines have become highly important. The future development and deployment of technology to actually remove debris promises to increase the sustainability of outer space if and when it becomes operational. It is incumbent upon the international community to proactively address the myriad technical, political and financial challenges that will inevitably be associated with active debris removal.

Similarly, the development of space situational awareness capabilities to track space debris provides significant space security advantages, for example, when used to avoid collisions. And while the sensitive nature of some information and the small number of space actors with advanced tools for surveillance have traditionally kept significant data on space activities shrouded in secrecy, recent developments followed by the Space Security Index suggests that there is a greater willingness to share space situational awareness data through international partnerships and this constitutes a most welcome trend.

The second theme deals with access to and use of space by various actors. This includes indicators of space security related to space-based global utilities, priorities and funding levels in civil space programmes, international cooperation in space activities, the growth in the commercial space industry, public/private collaboration in space activities, and space-based military systems.

As barriers to entry decrease, the rate at which new space-faring nations emerge will continue to grow. However, the limited nature of some space resources will post governance challenges to ensure equitable access for newcomers so that their ability to enjoy the benefits of space is not contingent on the date when they acquire the capability to access this domain.

The use of space-based global utilities has grown substantially over the last decade. Millions of individuals rely on space applications on a daily basis for functions as diverse as weather forecasting, navigation, communications, and search and rescue operations.

International cooperation remains a key aspect of both civil space programmes and global utilities. Collaborative endeavours in civil space programmes can assist in the transfer of expertise in technology for the access to and use of space by emerging space-faring actors. International cooperation can also help nations undertake vast collaborative projects in space, such as the International Space Station, whose complex technical challenges and prohibitive costs are difficult for anyone actor to assume.

Likewise, the role that the commercial space sector plays in the provision of launch, communications, imagery and manufacturing services, as well as its relationship with government, civil and military programmes, make this sector an important determinant of space security.

A healthy space industry can lead to decreasing costs for space access and use and may increase the accessibility of space technology for a wider range of actors. As well, the military space sector is an important driver in the advancement of capabilities to access and use space. Many of today's common space applications, such as satellite-based navigation, were first developed for military use. Space systems have augmented the military capabilities of a number of States by enhancing battlefield awareness, offering precise navigation and targeting support, providing early warning of missile launch, and supporting real-time communications. Furthermore, remote sensing satellites have served as a technical means for nations to verify compliance with international non-proliferation, arms control and disarmament regimes.

At the same time, the use of space systems to support terrestrial military operations could be detrimental to space security, especially of adversaries viewing space as a new source of military threat or as a critical military infrastructure, develop space system negation capabilities to neutralize the space systems of other nations.

A third and related theme is concerned with the security of space systems, with a focus on the related space security dynamics of space systems protection and space systems negation. Indicators of space security covered under this theme include the vulnerability of satellite communications, broadcast links and ground stations, the protection of satellites against direct threats, the capacity to rebuild space systems and integrate smaller satellites into space operations, Earth-based capabilities to attack satellites, and space-based negation enabling abilities.

The security dynamics of space systems protection and negation are closely related and space security cannot be divorced from terrestrial security. Further, under some conditions, protective measures can motivate adversaries to develop weapons systems to overcome them. In this context, it is important to highlight that offensive and defensive capabilities are not only related to systems that are physically in orbit and they include orbiting satellites, ground stations, data and communications links.

While military satellite ground stations and communications links are generally well protected, civilian and commercial assets seem to have fewer protective measures. The vulnerability of civil and commercial space systems raises security concerns since a number of military space actors are becoming increasingly dependent on commercial space assets for a variety of applications. While no hostile anti-satellite attacks have been carried out against an adversary, recent incidents testify to the availability and effectiveness of missiles to destroy an adversary satellite. Satellite resiliency measures include system redundancy, distributed architectures and interoperability which have become characteristics, for example, of some satellite navigation systems. Likewise, the ability to rapidly rebuild space systems after an attack could reduce vulnerabilities in space. The capabilities to refit space systems by launching new satellites into orbit in a timely manner and to replace satellites damaged or destroyed by an attack are critical resiliency measures. Smaller spacecraft may be fractionated or distributed on hosts that can improve continuity of capability and enhance security through redundancy and rapid replacement of assets. While these characteristics may make an attack against space assets less attractive, they can also make assets more difficult to track and could potentially hinder transparency in space activities.

In this context, it bears noting that in the past decade alone, ground-based anti-satellite weapons have been tested. Several communications satellites have been deliberately jammed, nations have conducted ASAT tests, missile defence systems have been used as ASATs and precursor technologies that would allow space-to-space offensive capabilities have been developed.

The fourth and last theme covers development related to outer space policies and governance under such indicators of space security as national space policies and laws, multilateral forums for space governance and other initiatives that may lead to policy development for space activities.

With regard to the normative environment for outer space activities, the Space Security Index recognizes that the existing normative framework for space activities is insufficient to address the current challenges facing the outer space domain.

International instruments that regulate space activities have a direct effect on space security because they establish key parameters for acceptable behaviour in outer space. These include the right of all countries to access space, prohibitions against the national appropriation of space, and the obligation to ensure that space issues with due regard to the interests of others and for peaceful purposes. International space law, as well as valuable unilateral, bilateral and multilateral transparency in confidence-building measures can make space more secure by regulating activities that may infringe upon the ability of actors to access and use space safely and sustainably and by limiting space-based threats to national assets, whether in space or on Earth.

While there is widespread international recognition that the existing regulatory framework is insufficient to meet the current challenges facing the outer space domain, the development of an over-arching normative regime has been slow. International space actors have been unable to reach consensus on the exact nature of a space security regime, despite having specific alternatives on the table for consideration. Proposals include both legally-binding treaties, such as the proposed Treaty on the Prevention and the Placement of Weapons in Outer Space and the Threat or Use of Force Against Outer Space Objects, known as the PPWT, and politically-binding norms, such as the proposed International Code of Conduct for Outer Space Activities. As I am sure most of you are aware, the latest revised versions of each of these proposals were made public quite recently.

There have been others. For example, in 2009, Canada had a proposal before the Conference on Disarmament which urged States to pledge not to place weapons in space, test or use weapons on satellites so as to damage or destroy them, and not to use satellites themselves as weapons. This was seen by some observers as a middle-ground approach inasmuch as these pledges were not intended to be legally-binding like the provisions of the International Code of Conduct, yet it specifically addressed the issue of potential space weaponization, like the PPWT.

There is widespread agreement to pursue measures that minimize the likelihood of an intentional interference with space assets during normal operations. This said, discussions related to space weaponization and the prevention of an arms race in outer space tend to be more contentious.

The establishment of a Group of Governmental Experts on Space Transparency and Confidence-Building Measures by the United Nations General Assembly and of the Committee on the Peaceful Uses of Outer Space Working Group on the Long-Term Sustainability of Outer Space Activities, for example, are seen as positive efforts towards the adoption of agreed transparency and confidence-building measures for space activities. Substantive negotiations in Paris, however, have been effectively deadlocked at the Conference on Disarmament for more than 15 years.

The Space Security Index acknowledges that the benefits and results from space exploration will continue to grow in astonishing ways and will contribute to the social and economic development of an increasing number of nations. The key challenge is to maintain a sustainable outer space domain so that the benefits derived from it can continue to be enjoyed by present and future generations.

Many thanks from the Canadian delegation for the long-standing support of the Space Security Index Project and thank you everyone for your attention.

FIRST VICE-CHAIRMAN *(interpretation from Spanish)*: Thank you very much Mr. Jaramillo for that wonderful presentation.

(Continued in English) Is there any delegate who has questions for the presenter?

I see none.

The second presentation on my list is by a representative of Italy entitled “Use of Earth Observation Data for Emergency Management and Situation Awareness”.

Please, you have the floor.

Mr. D. GRANDONI (Italy): Thank you Mr. Chairman. Mr. Chairman, distinguished delegates, satellite remote sensing of the Earth and its applications are becoming increasingly important to provide data and services essential to the sustainable development of countries, environmental protection and disaster management support. Earth observation is, and will remain, a major field in the Italian space strategic vision in the current decade. To this purpose, our National Cosmo-Skymed satellite system has been playing a lead role, further improving its performance, enhancing its functions and increasing its contribution as data provider in situations of international crises and emergency response.

In this presentation, I will focus mainly on its application for emergency response and situational awareness.

From the space infrastructure perspective, the Italian Cosmo-Skymed SAR constellation is the state-of-the-art satellite system designed, developed and operated to support emergency management operations and environmental monitoring worldwide. As a matter of fact, Cosmo-Skymed has the unique capability to collect multiple images daily over any area worldwide, thanks to its four satellite constellation and its own weather imaging capabilities. This enables formally unbelievable change detection and monitoring applications.

In order to fully exploit its unique imaging capabilities, Cosmo-Skymed is programmed to regularly acquire images over significant targets worldwide, large cities, UNESCO sites, active volcanoes and any other site that is considered as relevant. This is the Cosmo-Skymed background mission, extremely important to collect and make available historical data essential for multi-temporal analysis and change detection.

The Cosmo-Skymed system allows institutions, scientific users and industrial players to build reliable thematic change detection services and applications, combining together the radar signal intensity of two images acquired at different times with an essential parameter, interferometric coherence. This parameter indicates the degree of geometric consistency between two images acquired in different times and, therefore, combined with the detected radar signal intensity, it is an indicator of multi-temporal change.

Interferometric(?) coherence-based change detection analysis can be applied to agricultural monitoring, for instance, to control the phonological cycle of rice paddies in Thailand. During every month of the year, Cosmo-Skymed data provides information about the growth of rice in every field. This information is extremely relevant in terms of food security as it allows technicians and decision-makers to timely assess the rice crop status and to estimate its future availability for human consumption.

Interferometric(?) coherence-based change detection analysis can be applied to forest monitoring as well as it allows to easily identify clear-cut areas by comparing two Cosmo-Skymed images acquired at different times. Forest clear-cuts are evident in the Cosmo-Skymed multi-temporal image, thanks to the very high interferometric(?) coherence of areas without vegetation, without the blue areas in the image in this slide.

The high re-visit frequency of the Cosmo-Skymed constellation enables situational awareness applications as well. It is possible to identify vessels in the open sea and monitor their route, as in the case of the Italian Savina Caylyn Vessel that was hijacked in 2011. In this case, the Cosmo-Skymed system was the only source of information available to the Italian Coastguard, once the vessel's identification system was turned off. Thanks to Cosmo-Skymed's impressive re-visit capabilities, the Savina Caylyn Vessel was identified less than 24 hours after the event while cruising the open Indian Ocean.

Environmental pollution from oil spills caused by accidents or illegal discharges is a serious issue that is challenging marine and coastal authorities worldwide. Also in this field, the Cosmo-Skymed system is operationally providing a unique contribution thanks to the capability to repeatedly acquire images everywhere in the world at short notice and with an elevated frequency. As an example, the Cosmo-Skymed constellation supported the recovery operations after the impressive 2010 oil spill in the Gulf of Mexico when more than 150 Cosmo-Skymed images were acquired in about one month after the event, and you can see the dimension of the oil spill in the Cosmo-Skymed image on the screen.

Hydro-geological instability is posing a threat to the safety of citizens and the environment conservation in more and more areas worldwide. Italy is sadly historically affected by this phenomenon that needs to be regularly monitored generally over extremely wide and sometimes remote areas. Cosmo-Skymed gives its strong contribution in this area as well thanks to its capability to acquire a large number of images over the same area, regularly and in a short time. Analysing these images, experts can measure the real displacement in terms of intensity and speed across the whole 10 series for a huge number of single points in the image. Anomalies, like the one that is highlighted in this slide, can be easily identified and landslide early warning messages can be despatched to relevant authorities for a prompt intervention as in the present case of the Russian Federation railways monitoring.

The Cosmo-Skymed application in case of earthquakes is related to the capability of the sensor to detect the changes occurred in an area based on both radar amplitude and radar phase joint analysis of pre- and post-event images. Co-seismic interferograms enable it to array(?) this placement analysis comparing the interferometric phase of pre- and post-event images. The analysis of these images shows consecutive cycles of interferometric fringes that is a real measure of relative rough displacement along the satellite line of sight. Each fringe corresponds to 1.5 centimetres displacement, that is half of the X-Band wavelength, so the image that you see on the screen is the actual measure of displacement of each point after the earthquake in Christchurch, in New Zealand.

The combined analysis of the pre-seismic with the co-seismic coherence allows the immediate identification of urban areas where the coherence was disrupted and, therefore, where the most significant damages have occurred. Even if this information is not available at single building-level, it is of great value especially when the area is covered by clouds and optical satellites cannot acquire images and in the case of the Christchurch earthquake in New Zealand, in this case, we had to wait 10 days to get an optical cloud-free image. While analysing Cosmo-Skymed, we had immediately the feeling where the damages had occurred.

The Cosmo-Skymed application in case of floods relies on the physical response of weather(?) bodies when illuminated by the radar signal. Flood surfaces, like sending(?) water causes particular reflection of SAR-incident (intensity?) rays minimizing the intensity of _____(?) scattering towards the south sensor. This means that, generally speaking, standing water bodies appears to be dark when analysing SAR-intensity images.

There are incredibly numerous examples of Cosmo-Skymed applications for floods worldwide. I would like to focus on the recent floods in Central Europe during June 2013. In this case, the floods badly affected the three countries, Germany, the Czech Republic and Hungary, in widespread areas. Cosmo-Skymed strongly contributed to the flood monitoring over 20 different areas, including the full coverage of the Nube River in the Hungarian territory producing more than 100 flood extent maps.

Cosmo-Skymed is a suitable instrument to monitoring humanitarian crises as well. Starting from early 2012, Syrian refugees started to settle down in refugee camps prepared in the northern part of Jordan. Such camps, for example, in the Al Mafraq area, were growing fast and needed to be closely monitored in order to timely react to any upcoming need. In this case, Cosmo-Skymed help to reach 12 hours monitoring cycles combining optical satellite acquisitions in the local morning with radar satellite acquisitions in the local afternoon, therefore, enabling the identification of the camp development in that time interval. Further monitoring of the camp was carried out using Cosmo-Skymed data only, as you can see in this slide, showing in red the Al Mafraq camp expansion between November 2012 and January 2013.

Mr. Chairman, distinguished delegates, in concluding, these few examples that I have just presented to you do not cover the full range of feasible applications of data provided by the Cosmo-Skymed satellite constellation. I am confident that they give you a good representation of what it is scope and of its possible contributions to the sustainable development of countries and the well-being of populations on Earth. For further details, please do not hesitate in contacting us by e-mail. You can see the e-mail address on the slide, it is domenico.grandoni@e-geos.it.

Thank you for your attention.

FIRST VICE-CHAIRMAN: Thank you Mr. Grandoni for your presentation.

Is there any delegate who has questions for the presenter?

(Continued in Spanish) If you do not mind, I would like to put a question myself to the presenter.

With all the satellite technology applications at hand, is there any form or application to detect cases such as the Malaysian Airlines plane loss which has not been located as yet?

Mr. D. GRANDONI (Italy): Thanks a lot for your question. This is actually a particular application of satellite remote sensing for target identification. As we saw, it was possible to detect the Savina Caylyn Vessel in the middle of the Indian Ocean thanks to the fact that we were able to propagate the latest non-position and the planned satellite acquisitions accordingly. In the case of the Malaysian airplane, and I was actually astonished at how satellites were used because it is true too difficult to cover such a wide area like it could be the south-eastern part of the Indian Ocean. So there is the matter of coverage, of satellites and it is difficult to acquire images when you do not know exactly and you do not have any hint of where to look for. So in my opinion, in that case, it is very important the combined use of all technologies available. So any information and hint that can be provided in order to identify the area where you can identify the target is very valuable.

Another matter is then the effort needed to collect a huge amount of images over the whole Indian Ocean to analyse them and also to distinguish between what could be a potential alert and hint of the presence of what is remaining of the aircraft and what is actually another kind of target because if you are providing any information that the aircraft could be in that position, it must be credible and well-supported.

In that case, I was particularly impressed by the mapping efforts that were put by the whole crowd sourcing community. So there were a lot of joint efforts by satellite data providers to make available images and common people that were using platforms to quickly analyse them and find some hint. But at the end, we found that it was the combined integration of satellite technologies. So it was satellite communication and navigation with remote sensing that gave the most promising result to identifying where the aircraft was.

FIRST VICE-CHAIRMAN: Thank you Mr. Grandoni.

The third presentation on my list is by a representative of the Russian Federation entitled “The Effect of the Criterion Value of Single Entry Interference on the Efficiency of Use of the Geostationary Satellite Orbit Resource”.

Please, you have the floor.

Mr. M. M. SIMONOV (Russian Federation) *(interpretation from Russian)*: Thank you Mr. Chairman. Good afternoon distinguished delegates.

In my presentation, Mr. Chairman, I would like to touch on an important aspect of assessing the efficient use of the resource of the geostationary orbit. The Russian Administration is performing research at the International Telecommunication Union, ITU, Radiocommuniations Sector, in accordance with resolution 756, adopted at the World Radiocommunications Conference 2012. We have been exploring the impact of technical criteria used in the international coordination of satellite communications and broadcasting systems on the efficiency of use of geostationary orbit resources.

The aim of the research is to provide rationale for the technical methods that make it easier to access the orbit spectrum resource for all States that use or which plan to set up communications and broadcasting networks using GSO satellites.

As you know, communications and broadcast satellites are assigned in the Radio Regulations to frequencies above 3 gigahertz so even small antenna at terrestrial stations, a diameter of around half a metre, have sufficient spatial selectivity and make it possible to place enabling satellites in the geostationary orbit, two to three degrees away and this means that it is possible to put several hundred satellites into orbit without any form of unacceptable mutual interference. Nonetheless, this has turned out to be insufficient for creating new communications or broadcasting networks today and, as a rule, it is not possible to find space in the geostationary orbit.

I can give you an example. On this slide, we have data from the ITU. You can see that the total number of registered FSS frequency assignments in the Master International Frequency Register and there are 32,348 of these. Only 47 per cent, so less than half were registered after full coordination was carried out, but more than 50 per cent, 52.3 per cent were registered before completion of coordination under Point 11.41 of the Radio Regulations so they do not have protection from interference.

The basis of the problem of the overload of the geostationary orbit are physical reasons. It is a unique orbit. There are a limited number of frequency bands allocated for satellite communications and broadcasting and there is limited activity of terrestrial- and space-based stations.

Many possible ways of overcoming these limitations meet with the problem of increased expense, making the satellite systems uncompetitive.

A very important factor that defines the necessary angular spacing between GSO satellites is the criteria of permissible interference, both from one network, what is known as the single entry criteria, ΔT/T, or aggregate interference criteria which takes into account the impact of the satellites own noise and total interference from other satellite and terrestrial communication networks.

Now, permissible levels of interference between FSS satellites and GSO in non-para(?)-frequency bands, are set out in several ITU recommendations. For example, in recommendation S1323, as well as in Appendices 5 and 8 to the Radio Regulations.

The single criterion is used when coordinating any new network with existing or previously registered networks and it is established that the single entry interference should be limited to six per cent of the total system noise power with tolerance to aggregate interference of no more than 20-25 per cent. Now, the current value of six per cent was adopted many years ago when satellite communication networks had a very scarce power budget and there was a small number of active networks. At that time, maintaining a low level of interference was vital.

Currently, in a situation where we have very intense usage of space, and, first and foremost, of the geostationary orbit by communication satellites, obtaining a spectrum orbit resource, free of interference, is the main barrier to creating new communications and broadcasting networks in GSO. For this reason, the World Radiocommunications Conference 2012 adopted a special resolution 756 proposing that research be carried out by ITU-R to explore the effectiveness of the threshold value of six per cent for single entry interference, as is used at the moment, and the Russian Communications Administration, therefore, carried out an analysis of the impact of this level on the capacity of geostationary orbit satellites.

We took as our basis that interference only arise in the satellite Earth-line coverage area where overlap exists so interference is only reduced to required levels, thanks to the selectivity of the Earth station antenna, as you can see on this slide.

Calculation of the necessary selectivity of terrestrial station antennae and permissible angular spacing between neighbouring satellites in GSO with the increase of the single unit interference criterion was carried out using the following basic known parameters: the signal to noise ratio, in the line subject to interference; the value of single entry interference criteria; and the power flux density of useful signal to interference. And there was no need to choose specific values for PFD for noise intensity in the frequencies of the signal and of the interference. The results of the analysis were true, regardless of these values.

This approach allowed us to evaluate the impact of increasing the minimum necessary spacing between GSO satellites where there are neighbouring networks of different origins which have significant differences in their PFD.

It was calculated that a possible reduction in angular spacing between neighbouring GSO satellites when there was an increase in single entry interference from six per cent to 12, 20 and 50 per cent and the associated possible increase in the number of GSO satellites, and this was done for various different frequency bands. And the analysis demonstrated that increasing $\Delta T/T$ from six per cent to 12 per cent to 50 per cent made it possible to decrease the angular spacing between neighbouring satellites in GSO by a factor of 1.3 to 2.4.

Also, we saw that a possible reduction in angular spacing between satellites and GSO could be defined in another approach to using a starting parameters the maximum Q-Band value for PFD permitted under the Radio Regulations and an interference value raised by 10 or 20 decibels. This means that it is possible to reduce the angular spacing of neighbouring satellites from 1.3- to 2.3-fold with an increase in $\Delta T/T$ from six per cent to between 12 and 50 per cent. And this form of increase unfortunately does have some disadvantages. It is clear that increasing the permitted level of interference will lead to some degradation in the link energy budget and decrease the ratio of useful signal to some of the noise and interference. We would need then to either accept the loss of energy budget or increase the power of the onboard transmitter on the satellite and the calculation you can see here on this slide, using ITU-R recommendation 1751 demonstrated that this result in the link energy budget will not exceed typical reserves in current FFS networks from 0.66 to 3.45 decibels.

But it is important to emphasize here that our calculation to the count of aggregate interference from all FFS networks, based on the ratio of single entry and aggregate interference established in ITU-R recommendation S1323.

The analysis demonstrated that the capacity loss for a model FFS network, with a signal noise ratio of 10.5 decibels, with a three-fold increase in permitted interference from six per cent to 20 per cent, is less than 12 per cent and if there is an increase of more than eight-fold to 50 per cent, losses are less than 28 per cent. This would allow an increase in GSO satellites of up to 2.3-fold. You can see these data in this table on this slide.

It is also worth noting that currently most existing networks operate with interference levels that are well above six per cent. The results of the calculations performed show that networks with universally-acceptable model parameters with an angular spacing with neighbouring networks of two to three degrees, receive actual interference of 40 to 100 per cent or more. This shows that current existing networks are already operating with elevate interference levels and that the emergence of new networks are thrust to produce single entry interference of up to 20 per cent will not create major problems. It will simply bring the regulations into line with the real situation.

So, what conclusions can we draw from this research? First of all, with an increase in single entry interference from six per cent to 20 per cent in the total capacity of all FFS networks, we will see at least a 1.4-fold increase as well as a great increase in the number of GSO satellites. Our research has shown that increasing the single entry interference criteria for FFS networks, from the current level, will make it possible to decrease the angular spacing between neighbouring satellites in the geostationary orbit and that will mean that we can have additional satellite networks. It will also simplify coordination. The price of this is a loss of energy balance in each network from 0.66 to 3.45 decibels, or there will be a capacity reduction for each network of between 5.5 per cent and

28 per cent. If we increase the threshold value for single entry interference to 20 per cent, then the total capacity of the GSO will increase 1.4-fold. It is safe to say that, given current technology, a loss of energy budget from 1.5 to two decibels can be compensated for in most satellite networks without loss of capacity.

Taking a decision on this complex issue, namely to increase permitted single entry interference levels, falls within the mandate of the World Radiocommunications Conference where all States have equal rights. Yet the interests of different countries are not the same. Some are, above all, interested in receiving new resources to create new satellite networks, while others want to protect their existing networks from interference. In our opinion, a compromise would be to introduce an increased ΔT/T criterion that only applies to new networks and relates to new networks but such a decision will delay any real results or real effect by many years or decades indeed. In our view, the procedure and timescales for the transition to the new ΔT/T criteria should be established in a special resolution of the 2015 World Radiocommunications Conference and that is something that the Russian Federation Communications Administration is currently working on.

Thank you Mr. Chairman and thank you delegates.

FIRST VICE-CHAIRMAN: Thank you very much Mr. Simonov for your important presentation.

Is there any delegate who has questions for the presenter?

Yes, please, you have the floor. The distinguished delegate of Mexico has the floor.

Ms. R. M. RAMIREZ DE ARELLANO Y HARO (Mexico) *(interpretation from Spanish)*: Thank you Chairman. I look at problems since I am a lawyer, but I have a question I would like to ask. With the energy reduction through this permissible interference with the values is mentioned. What possibility is there because there has been a mention of the possibility of new networks and satellites with possible interference with energy loss. There would also be lifetime loss for the satellite. So how many satellites or how many new networks in the geostationary orbit would be possible with this resolution which, at the 2015 Conference might already be considered? How many can be placed? Because this might be a reply for emerging countries. We are talking about losses and so forth but we are not talking about losing satellites. We are talking about the possibility of gaining other orbital positions.

I hope this was clear. I can guarantee I am a lawyer and I do not follow all the technical part but I see this as a possibility for emerging countries to be able to place satellites which is a need.

Thank you.

FIRST VICE-CHAIRMAN *(interpretation from Spanish)*: Thank you for the question put to Mr. Simonov. You have the floor Sir.

Mr. M. M. SIMONOV (Russian Federation) *(interpretation from Russian)*: Thank you very much to the distinguished representative of Mexico for that question. I will answer as follows.

In the lifetime of a satellite, the change in the criterion of single entry interference will not have any impact. What we are talking about here is the change in the energy balance for each individual network. Any network which is currently operating has such an energy reserve and reducing it to certain levels will have no impact on the parameters of operating networks. Now, in the case that there is no reserve left, that it is zero, then the network will continue its work but with a certain reduction in its capacity so that it can work in conditions of increased interference but the lifetime of the satellite which is ensuring the operation of that network will not change.

Now, the second half of the question was about how many additional satellites it would be possible to bring into operation thanks to an increase in this value. Our assessment says that if we increase from six per cent to 20 per cent, then the total volume in orbit would increase 1.4-fold, so by 40 per cent. However, that does not mean that in the near future we will be able to have an additional 40 per cent. First of all, increasing this value will have an impact on the lists that are published by the Bureaux of the ITU which set out which Administrations have to carry out coordination if there are any new satellites in order to protect their designated frequency from interference. Now, a transition to the new level, an increased level, is something that would have to start after the day after the adoption of such a decision. And if it was possible to apply this criteria to all networks, not just new ones, but also pre-existing, pre-registered ones, are those which are in the course of registration at the moment, then the effect that we would see from this increase would be far faster than if the new value only applied to new networks. It could take a long time for us to see an effect otherwise.

Thank you very much and thank you for the opportunity to respond to this question.

FIRST VICE-CHAIRMAN: Thank you Mr. Simonov.

Is there any other question for the presenter?

I see none.

Distinguished delegates, I will shortly adjourn this meeting so that the Working Group on the Long-Term Sustainability of Outer Space Activities can hold its third meeting.

Before doing so, I would like to inform delegates of our schedule of work for tomorrow morning.

We will meet promptly at 10.00 a.m. At that time, we will continue and hopefully conclude our consideration of agenda item 11, Space and Water, and agenda item 12, Space and Climate Change. We will also continue our consideration of agenda item 13, Use of Space Technology in the United Nations System.

There will be two technical presentations tomorrow morning. One by a representative of India entitled “Use of Earth Observation Data for Water Resources Assessment and Management in India”, and one by a representative of Burkina Faso on the CORS Network.

The Working Group on the Long-Term Sustainability of Outer Space Activities will then hold its fourth meeting.

Are there any questions to this proposed schedule?

I see none.

Delegates are reminded again please to provide the Secretariat with written amendments to the provisional list of participants before close of business today. The list was distributed yesterday morning through the pigeonholes as Conference Room Paper 2.

Finally, I invite you all to the reception hosted by the United States just outside in the Coffee Corner, starting at 6.00 p.m.

I now invite the Chair of the Working Group on the Long-Term Sustainability of Outer Space Activities, Mr. Peter Martinez, to convene the third meeting of the Working Group.

This meeting is adjourned until 10.00 a.m. tomorrow morning.

The meeting closed at 4.52 p.m.