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Committee on the Peaceful Uses of Outer Space

Unedited transcript

622nd Meeting
Wednesday, 16 June 2010, 10 a.m.
Vienna

Chairman: Mr. Dumitru Dorin PRUNARIU (Romania)

The meeting was called to order at 10.23 a.m.

The CHAIRMAN: Good morning, distinguished representatives. I now declare open the 622nd meeting on the Committee on the Peaceful Uses of Outer Space.

This morning we will reconvene on agenda item 8, Report of the Scientific and Technical Committee on its forty-seventh session to consider the outstanding matter on the Symposium at the Scientific and Technical Subcommittee next year.

We will then continue and hopefully conclude our consideration of agenda item 11, Space and society, agenda item 12, Space and water and agenda item 13, Space and climate change.

We will begin our consideration of agenda item 16, Other matters, with focus on organizational matters and views expressed by regional groups.

There will be four technical presentations this morning, the first one by the representative of Germany, entitled "Volcanic ash layers over Europe, Air-borne observations with the DLR falcon research aircraft in April-May 2010", the second one by Japan, entitled "Mission objectives and endurance status of GOSAT IBUKI, the third one by India entitled "OCEANSAT-II meeting global demand", and last we have a video and presentation by Japan entitled "Re-entry of HAYABUSA on 13 June 2010.

This evening Germany has a reception at the residence. Invitations have been circulated.

Agenda Item 8 - Report of the Scientific and Technical Subcommittee on its forty-seventh session (continued)

As you will recall, we suspended agenda item 8, Report of the Scientific and Technical Subcommittee on its forth-seventh session and for consultations of the Secretariat with COSPAR on the possibility of changing the theme of next year's STSC symposium to the theme of long-term sustainability of outer space activities, as proposed by the United States.

I would now like to give the Secretariat the floor to report back on the results of consultations with COSPAR

Mr. HEDMAN (Secretariat): Thank you, Mr. Chairman. Yes, the Secretariat will indeed update on consultations that the Secretariat has had with COSPAR yesterday evening. We contacted the COSPAR Secretariat and we were informed that the Bureau of COSPAR has already decided on the topic – "Planetary protection" – as recommended by the Scientific and Technical Subcommittee in February this year. They of course understand the interest and the value of having the topic of long-term sustainability of outer space activities addressed within such a symposium framework. However, they have difficulties to supersede the decision by the COSPAR Bureau and they have already consulted and actually identified the organizer for this particular symposium, who has started working on the symposium programme. They asked the Secretariat to convey to the Committee that they still hope that planetary protection would be as agreed by the Scientific and

In its resolution 50/27 of 6 December 1995, the General Assembly endorsed the recommendation of the Committee on the Peaceful Uses of Outer Space that, beginning with its thirty-ninth session, the Committee would be provided with unedited transcripts in lieu of verbatim records. This record contains the texts of speeches delivered in English and interpretations of speeches delivered in the other languages as transcribed from taped recordings. The transcripts have not been edited or revised.

Corrections should be submitted to original speeches only. They should be incorporated in a copy of the record and be sent under the signature of a member of the delegation concerned, within one week of the date of publication, to the Chief, Conference Management Service, Room D0771, United Nations Office at Vienna, P.O. Box 500, A-1400, Vienna, Austria. Corrections will be issued in a consolidated corrigendum.

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Technical Subcommittee, the topic to be considered in that particular symposium at S and T (?) in 2011.

So, Mr. Chairman, with that report, I leave it to you. Thank you.

The CHAIRMAN: I thank you for that explanation.

Are there any comments by delegations, or do I take it that the recommendation of the STSC to have the COPUOS symposium agreed by the STSC in February this year is acceptable?

It is so decided, to keep the title.

Is there any other delegation wishing to speak under this agenda item at this morning's meeting?

We have a request by Canada to comment on the UN-SPIDER.

Mr. BAINES (Canada): Thank you, Mr. Chairman, for giving us this opportunity to speak. We have taken the floor this morning to reply to the UN space aid fund paper that had been presented earlier in the week and for which the Plenary was not given time to comment on the contents of that document.

It is the view of Canada that we do not see the necessary for creating a space aid plan to purchase allied imagery. We are concerned that this new mechanism will add confusion for the users on where best to go to get data under emergency circumstances. We believe that the Charter is the best place to acquire these images. The most important suppliers of the Charter are members of the Charter, as well as USOV has access to making requests for data under the Charter. These members within the Charter are also working with Google to disseminate the data directly to the end users. We are concerned about overlaps.

We believe that the problem to be addressed is not access to the images, but what to do with that data once the end user has received it. This issue is not addressed in the proposal presented in the document by UN SPIDER.

In addition, we are concerned that the offices that have been established to assist in the UN-SPIDER context may not necessarily possess the best expertise to generate the value added products needed by Member States requesting data in response to an emergency. We believe that this would be a better place for UN-SPIDER to play a role.

The Charter provides data for a suitable time period after an emergency event. We provide the data under the Charter for early recovery phase of emergency response. We believe that monitoring in the long term is the responsibility of States.

More importantly, we are concerned that by paying for imagery through the UN SPIDER we may reduce the willingness of commercial operators to provide data for free as many currently do.

This summarizes our concerns with respect to the creation of a space aid fund. We would be interested in hearing the views of other members of the Charter. Thank you.

The CHAIRMAN: I thank the distinguished delegate of Canada for his intervention in connection with the UN SPIDER.

Does any other delegation wish to speak?

The Russian Federation has the floor.

Mr. CHERNUKHIN (Russian Federation): Good morning, Ladies and Gentlemen, and many thanks, Mr. Chairman for giving us this opportunity to make some brief comments, not specifically on this agenda item. What we would like to do is elaborate a little on the event we signalled yesterday, the launch of a manned Soyuz space vehicle to the international space station. According to the information we have, this morning at 1.30 a.m. Moscow time the manned Soyuz tma 19 spacecraft was launched from the Baikonur launch facility towards the international space station. At this time it has reached its orbit.

The crew includes three individuals, the captain, Russian cosmonaut Fyodor Yurchikhin and two NASA astronauts, Douglas Wheelock and Shannon Walker, an astrophysicist who is going to conduct a number of useful scientific experiments in orbit.

This mission is the 100th jubilee mission to be carried out within the framework of the international space station. It was the 24th international crew mission to be placed in orbit. They will spend five and a half months in orbit and will conduct more than 40 scientific, technical and other experiments to benefit Earth surface research as well as near space and far space research.

Mr. Chairman, this Committee should perhaps wish our wonderful international crew every success. This crew will join the crew that is already working in orbit and their work is not easy, but very import. Let us please give them a round of applause.

Thank you very much, Mr. Chairman. [Applause.]

The CHAIRMAN: Thank you very much, distinguished representative of the Russian Federation for the information. Of course we all wish success to the crew and when they return to Earth, soft landing.

Is there any other delegation wishing to speak?

I invite the representative of Saudi Arabia.

Mr. TARABZOUNI (Saudi Arabia): Good morning, Mr. Chairman, good morning representatives. First of all, I am really so concerned at what the Canadian delegation has said about the UN-SPIDER fund, but I would like to say that the Prime Minister of Qatar in a speech in New York a few days ago asked to make an international fund for disaster management and we will follow this up with the Qatar Government and I will give you the information later on.

Regarding the other things, we do not accept the data of any satellite operator for remote sensing to be given to Google because it is as he said, he does not know what the country is going to do with the data after they receive it. We do not know who is receiving the data from Google and for what it is being used, and if there is the right of the open skies to take images of my country, I do not allow my images to be distributed without my permission.

Thank you very much.

The CHAIRMAN: I thank the distinguished representative of Saudi Arabia for his intervention.

Is there any other delegation wishing to address the session this morning?

I invite the representative of Colombia.

Mr. YEPES (Colombia): Thank you so much, Mr. Chairman. I am referring to the Canadian statement and I am a little concerned at the comments made by the representative of Canada on this subject in particular. I would like to be acquainted with the views of the Office on this matter that Canada referred to.

The CHAIRMAN: Thank you, Mr. Yepes, of Colombia.

Are there any other delegations wishing to comment? I see none.

I would like to ask the representative of SPIDER if he has any comments.

Mr. STEVENS (UN-SPIDER): Thank you, Mr. Chairman, for providing the opportunity for the Secretariat further to develop on the views put forward by the distinguished delegate of Canada, which are particularly valuable to the programme. Historically, Canada was one of the countries which strongly worked to have SPIDER in place. In many days what we have today in terms of the framework for SPIDER were the discussions we had within the Ad Hoc Expert Group which Canada led for many years.

The Charter – do not get me wrong – is one of the main initiatives, so it is not an issue of trying to replace the Charter, it is an issue of ensuring that every country in the world accesses what is available including from the Charter. As mentioned in my presentation during the briefing, we are managing to cover today 80 per cent of what is available. We are looking at ensuring recovering 100 per cent.

Every country should have the right to access new space-based information for emergency response, and that is not happening today. Yes, we are incorporating the body of the Charter. I can give you an example of where we have had our request denied either because the request came on the eleventh day of the flood and the Charter rule says only up to ten days of flood or because the actual characterization of loss of property and life was not there, so it was not accepted.

What do we do? Go back to the Member State who has the right to have the Charter they do not accept? We have to go after other alternatives, and in this case the other alternatives are there. So we are not

looking at overlaps, we are making sure that the gaps do not exist. If there is an overlap, it is even beneficial. We just have to ensure that there are no gaps in place.

What to do with the data? The mandate of SPIDER ensures that countries can access and use. The Charter provides a map; the Charter does not provide the data. Yes, disaster managers want a map, but countries have institutions in the country which can be trained, and the next step is that they can do it themselves. That is why it is important that when the country has the ability to process the data themselves, we work with the country with the Charter, with Central Asia, to ensure the country has a capacity, so the next time there is a flood it is easier, and we are not all running off helping the country.

What is there to say about the offices? SUPARCO in Pakistan, the National Space Research Institute in Ukraine, these to me are all institutions which have the capacity; RCMRD in Kenya, Cathalac in Panama. They have the capacity. I have moved out, but if they receive the data they will do the processing. These are leading institutions.

Yes, although low resolutions are made available through the Charter, it is more on a case-by-case basis. Haiti and Chile – it was fantastic in terms of what was available, but try getting high resolution for a flood in Gaza(?) which happened 12 days later. It did not come. The imagery was taken, there was an $8,000 tag bill to pay for the imagery, the money was not there, we were unable to come up with the high resolution imagery to support the floods, so we could work together with the Charter and the GUI(?) to ensure that there is more high resolution available, but when you are in an emergency, if you do not have access and all you need is $8,000 to ensure that a country gets high resolution imagery, I think it is a small fee to pay in terms of supporting the country.

I really [do not] think that the willingness to pay will reduce the willingness of commercial providers to provide it for free. I think much to the contrary. We are looking straight from the country to use space-based information, we are looking at countries actually incorporating that type of information in their decision process, so there might be an initial step where you are providing the imagery paid for them, the next step is that the countries will see the importance and will ensure that we get to pay it the next time. I see much more sort of a small step to leap into countries actually being able to understand the importance of space-based information. The next time they will say yes, I want that.

I can give examples of a number of times where we have supported countries where they looked at that and said, I liked it very much. Next time, make sure we get it in time. So these are all things to be discussed. I think we have a long way to go. I think the Charter's information has brought us here. I think the space aid fund is going to be an additional thing that will really support filling in the gaps and ensuring that countries have access and use.

At the UN, we have concerns with Google as well. We get the same feedback from various meetings, but on the other hand we do leverage on Google as much as possible. But there is a point when the data has to be in the country, so even if you are serving the imagery through a Google interface – all of us do that – at one point you do have the data to do your own analysis and to do more than what is available.

This is something that we have been discussing for a year. In the B…… workshop in October we will be convening a special session on this and we will welcome the opportunity to continue discussing this and improving this.

Thank you, Mr. Chairman.

The CHAIRMAN: Thank you.

Are there any other comments on this subject?

I invite the representative of Canada.

Mr. BAINES (Canada): Thank you very much, Mr. Chairman.

There is a lot of good work being done by UN-SPIDER and there is a lot of good work being done by the Charter. We just want to minimize the number of overlaps, and the overlaps can come in multiple organizations requesting imagery from almost the same spot in a disaster recovery. We do not want to contribute to the difficulty of de-conflicting orders as a part of the satellite operations, and therefore we think it is important that the Charter members task their satellites to provide the data in the disaster response.

So our comments should be related to the creation of the space aid fund which we oppose and versus the whole of UN-SPIDER programme which we continue to support.

Thank you.

The CHAIRMAN: I thank the distinguished delegate of Canada for his comments.

Are there any other comments? I see none.

We have therefore concluded our consideration of Item 8, Report of the Scientific and Technical Committee on its forty-seventh session.

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

Agenda item 11 – Space and society

The first speaker on my list is the distinguished delegate of Venezuela. You have the floor.

Ms ACEVEDO (Venezuela): Mr. Chairman, in full compliance with the request of the General Assembly of the United Nations to promote education and to create opportunities to encourage citizen participation in the area of space science and technology, the national Government via the Bolivarian Agency for Space Activities, ABAE, has developed a distance learning course on remote sensing technology to analyse earth sciences and to support educational projects, and this is part of a larger project known as Application of satellite technology to social, scientific and technological projects.

The purpose of this exercise is to train teachers in primary and secondary education teaching geography and related subjects using satellite imagery as a teaching aid for our geographic environment in order to ensure the participation of educational communities in the design, assessment and implementation of public plans and policies at the local, regional and national levels.

This course was designed to be presented in three theoretical and practical modules that can present knowledge on geographic area, space, the basic principles of remote sensing and disaster management, hazards, vulnerability and risks and it is structured in the following manner: (1) approximation or grasping geography; (2) visualizing or geographic space from the satellite perspective; and (3) analysing our geographic environment by using space remote sensing as a tool.

The distance training platform was designed in the context of learning in a dynamic context. So we have on-line presentation of information, photography, diagrams, audio and visual materials, web pages, pf documents and services activities, quiz-type questionnaires, tests, forums, chats and other resources. Via this platform we have proper follow-up for teachers in a variety of areas, enabling them to interact and it can function in an independent manner irrespective of how many users are connected at a time, and it can evolve in terms of its design and structure so that new training tools or fact functionalities can come on line.

From 24 May to 4 June we did a trial run with the participation of 36 teachers. With this period of time, all the activities in the three modules designed for the course were tested. As a result thereof, 19 teachers that were part of the programme satisfactorily completed the activities such as mandatory reading, practical exercises and question sheets.

Furthermore, and so as to institute space science and technology in the educational programme, ABAE, in coordination with the post-graduate commission and the international relations faculty of the Central University of Venezuela, has organized the optional course under the title “Venezuela and the international cooperation scenarios on the use of outer space for peaceful purposes”. This course provides basic information on the international cooperation cases associated with the peaceful use of outer space, as well as the origin, object, function and characteristics of Venezuelan activities in this regard.

The participants made up a multidisciplinary team with engineering, physics, law, geography and international relations represented as disciplines as part of the use of the Simon Bolivar satellite and in keeping with the main social purpose thereof for excluded communities, ABAE, in coordination with the Ministries of Education and Public Health of country, has implemented a telemedicine and tele-education project in the indigenous communities in the Antonio Dias municipal area in the Acura delta state.

At the end of 2009 we had satellite interconnection for schools and outpatient clinics, access to Internet for educational and medical purposes. We had installed and operated 32 IT and telematic centres. We had placed solar panels in schools of the area 12. We had beefed up the solar energy portable take systems in schools in addition to training medical staff, people moving through the area or living in the area. It is expected that this pilot programme will be extended to other regions.

Likewise, the Simon Bolivar satellite is being used to strengthen the national seismological network in coordination with the Venezuelan Seismological Foundation FUNVISIS for the purpose of improving the response and capacity management of the national Government whenever a disaster takes place.

The CHAIRMAN: I thank the distinguished representative of the Bolivar Republic of Venezuela for her statement.

The next speaker on my list is the representative of the Libyan Arab Jamahiriya.

Mr. GASHUT (Libyan Arab Jamahiriya): Thank you, Mr. Chairman. My delegation would like

to share information regarding space-related work in Libya. We have a programme designed to strengthen human resources in this area with a view to sustainable development. Specifically, we have earmarked two stations for educational purposes particularly targeting the most remote areas of the country. Relevant provisions have been introduced in high school curricula, specialized syllabuses have been developed, including modules dealing with astronomy, space research, and this has become part of the regular school curriculum, as well as college curriculum.

In the year to come, as part of the International Week on Space, we are going to launch a satellite information reception station with the support of the French Space Agency and the European Space Agency. This is in a remote area 1,000 kilometres from Tripoli and it is going to be a centre for receiving satellite data from a large area – 14 African countries.

Libya, as you may know, has been pioneering in this kind of work. We have a micro-telescope installed on mobile vehicles specifically designed to study certain hard to pinpoint phenomena and at the moment we are putting together a special programme that would make use of this and similar devices, in particular with a view to working with remote sensing programmes and transmitting the data received by the Internet.

We have also set up a network for seismic research which will be used to look at seismic threats throughout our territory, using relay retransmission stations which have specialized equipment that receives and analyses data and then relays these data to major university research centres where they are analysed in depth, to come up with patterns for seismic activity and eventually and hopefully earthquake prediction and early warning.

In the area of meteorology we have also made great strides in putting in place practical application programmes based on space-generated data. We thus analysed various major challenges to development particularly related to environmental pollution and droughts, as well as urban sprawl which threatens the survival and the sustainable development of rural areas.

To conclude, my country is a developing country but it attaches great importance to developing a space programme using scientific and technological data and the support of pioneering States towards sustainable development.

Thank you very much.

The CHAIRMAN: I thank the distinguished representative of the Libyan Arab Jamahiriya for his statement.

Is there any other delegation wishing to speak under the subject item in this morning's meeting?

I see not.

You will recall that, as endorsed by the STSC this year, the Working Group of the Whole of the STSC session in February this year recommended that the issue of promoting the greater participation of young people in space science and technology be considered under the item "Space and Society" inf corpus. This means that the annual conference on paper with contributions by Member States on this matter will be submitted under this agenda item in corpus and not for the Working Group of the Whole and STSC.

There are no objections?

It is so decided.

We have therefore concluded our consideration of agenda item 11, Space and Society.

Agenda item 12 – Space and water

I would now like to continue and hopefully conclude our consideration of agenda item 12, Space and water.

The first speaker on my list is the distinguished representative of Germany.

Ms. FROEHLICH (Germany): Mr. Chairman, distinguished delegates, groundwater plays a crucial role for human society and for the environment. Concerns over groundwater, related water supply, water quality and the degradation of ecosystems are increasing, as this resort is more and more affected by natural processes as well as human activities. A better understanding of the global water cycle and water storage processes can contribute substantially to water management as an efficient and sustainable use of water resources.

The measurement of gravity that the Grace mission obtained is a powerful new tool for hydrologists who study water movement. Grace is a joint partnership between NASA and the German Aerospace Centre. It is unique in its capability to measure the variation of the earth gravity by collecting global data every 30 days to describe the global water cycle. The immense accuracy of the distance

distance measurements allows the earth gravity to be measured approximately once a month over a period of several years.

From the temporal variations, geo-scientists have already derived new insights into dynamic processes in the earth's interior, in the water ……of processes over land and in the oceans and in the development of ice sheets and glaciers on Greenland and Antarctica.

For the time period of 2002 to 2008 it was possible to describe land and groundwater supply. A dramatic lowering of the water table could be detected in the region of north-west India, where a loss of 109 cubic kilometres was measured in six years leading to a growing-down of the water table of 10 centimetres per year.

Another region affected by a lowering of the groundwater table is California, for which mission data for 2003 to 2009 was analysed revealing a grow-down of one metre per year.

Although the Grace mission has exceeded its expected lifetime already, it is still in very good condition and continues to measure the earth gravity with constant quality.

In addition, the framework of the joint initiative of the European Commission and the European Space Agency called GMS(?) services are being developed that are dedicated to the development of monitoring services for marine environment using observation data. The services contribute to the detection and characterization of global fuels and algae concentrations, the detection and monitoring of oil spills and the drifting and furthermore to the classification of changing ground plant and ……in the Baltic Sea.

The German Space Centre has had a complementary national activity for the project Demarini. The project aims at establishing services for the specific needs of the Northern and Baltic Sea and the coastal zones. The project will include innovative remote-sensing techniques from monitoring and management activities.

Mr. Chairman, distinguished delegates, we thank you for your kind attention.

The CHAIRMAN: I thank our distinguished delegate of Germany for her statement
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The next speaker on my list is the distinguished representative of India.

Ms. RAMACHANDRAN (India): Thank you, Mr. Chairman.

Mr. Chairman, the Indian delegation is happy to note that the deliberations on space and water are significantly contributing in creating awareness of the potentials of space technology in managing this precious natural resource.

The Indian space programme since its inception has continuously demonstrated ways and means of harnessing the benefits of space technology for water resource management through various application studies at national and regional scales.

India is periodically mapping and monitoring natural resources using satellite data and creating a digital data repository of natural resources, 1 to 250,000 annually and a finer scale of 1 to 50,000 once in every five years using satellite data of multiple resolution derived from various space platforms. Satellite data provides potential information about hydro-geological parameters required for generating groundwater prospect maps at 1 to 50,000 scale. This has been effectively demonstrated under the national project called Rajiv Gandhi national drinking water mission. One of the successful applications of this to identify the groundwater prospect of ……. at …….. sites taken up on behalf of the Ministry of Rural Development.

As of today, the groundwater prospect maps have been prepared for 15 states covering more than 15 per cent of the country's geographical area which provide valuable inputs not only to the local community but also to the decision makers at various levels. Using these maps, a large number of wells have been drilled with success rates varying from 90 to 95 per cent.

In addition to many national, regional and local watership management projects to develop land and water resources development plans, the Government of India has taken up a scheme for comprehensive assessment of water resources in the country through India's water resources information system project under the Ministry of Water Resources.

India Waters will provide a credible and contextual view of India's water resources data along with allied natural resource data and information

mainly derived from satellite data. The database will have more than 30 special ….. collected for a period of the past five to 50 years.

In yet another national endeavour, the accelerator irrigation benefit programme, AIBP, high resolution satellite data is being effectively used in mapping and monitoring of the irrigation infrastructure in the country. So far 53 irrigation projects covering about 5.05 million hectares spread across 18 states have been studied. Satellite data has also been used to map the current status and to monitor the spatial extent of water logging, sanitation in more than 800 major and medium irrigation canals.

High resolution satellite data was also used to evaluate around 750 towns spread across six states under the national project on repair, restoration and renovation, the NPRR programme. The digital elevation maps and land cover data derived from satellites, along with hydro-map data are being used in hydrological modelling for a fresh assessment of national water resources in the country.

A number of studies have been taken up for inventory monitoring and retreat of Himalayan glaciers. Snow melt run-off models for five major Himalayan basins are being developed for providing both short-term (fortnightly) and season snow-melt forecasts. Flight forecasting models using various satellite derived inputs have been developed for the River Godavari for real time implementation during the flood season.

Mr. Chairman, India also has a problem of plenty in many regions especially during the rainy seasons due to its varied topography. The recent cyclonic storm Laila caused havoc and inundated scores of villages, inflicting massive damage to the infrastructure and claiming lives in the states of Andhra Pradesh and Tamil Nadu before heading to the neighbouring state of Orissa. India has on several occasions demonstrated its ability to handle water-related damages by harnessing the capability of both observation and communication satellites.

India also shares its prowess and expertise through many international mechanisms including international charters on space and media disasters and other issues.

In conclusion, the Indian delegation would like to reiterate that it is willing to share its knowledge in this important area of space technology application to the needy countries.

Thank you, Mr. Chairman.

The CHAIRMAN: I thank the distinguished delegate of India for her statement.

Is there any other delegation wishing to speak under this agenda item at this morning's meeting?

I see none. We have therefore concluded our consideration of agenda item 12, Space and water.

Agenda item 13 – Space and climate change

I would like now to continue and hopefully conclude our consideration or agenda item 13, Space and climate change.

I will turn to the list of speakers. The first speaker is the distinguished representative of Germany.

Ms. FROEHLICH (Germany): Mr. Chairman, distinguished delegates, climate change is recognized as the major environment issue of our time. The fourth assessment report of the Intergovernmental Panel on Climate Change, IPCC, estimates that global deforestation and forest degradation contributed 17 per cent of global annual greenhouse emissions. The main part of these emissions results from the destruction and degradation of tropical forests in developing countries and countries in transition. Reduction emission from deforestation and forest degradation is therefore regarded as one of the important measures to combat climate change.

The assessment of forests has been established as the focal area of the GMS service element for forest monitoring, where Germany has the lead in Europe. In 2007, the forest monitoring expanded the service for providing for the development of red pilot projects in Cameroon and Bolivia. The red pilot project in Cameroon which was implemented between 2007 and 2009 has the overall aim of integrating the application of the world technology with the policy formulation.

The project intends to establish baseline projection of emissions caused by deforestation combined with regional projection of degradation nested in a wall-to-wall approach.

Key issues that are being addressed in the pilot include estimation and monitoring of forest area using greenwood censoring methods and testing both national and sub-national approaches.

In the course of several activities in Germany for the development of earth observation base methods for monitoring, recording and verifying correct implementation, the German optical satellite mission, FPI, has proven to deliver input data of high spatial accuracy for the delineation of forest boundaries as well as forest area degraded due to illegal logging and fire and report them, monitoring of the ……. processes with its high temporal resolutions.

Furthermore, the German radar mission TerraSAR-X provides additional value as it allows data takes of cloud-covered areas which is of high value for tropical forest areas. TerraSAR-X data contributed to the Geo Forest Carbon Tracking Initiative.

In addition, the German delegation have had a technical presentation today under agenda item entitled "Volcanic ash layers over Europe", "Air-borne observations with the DLR falcon research aircraft in Spring 2010.

Mr. Chairman, distinguished delegates, we thank you for your kind attention.

The CHAIRMAN: I thank the distinguished delegate of Germany for her statement.

The first speaker on my list is the distinguished representative of India.

Ms. RAMACHANDRAN (India): Thank you, Mr. Chairman.

The Indian delegation deems it a privilege to take the floor to address the very important topic of space and climate change and brief this august gathering on the initiatives taken by India on climate change studies using various space and ground-based observations.

Increasing evidence over the past few decades indicates that significant changes are taking place in climate, primarily due to anthropogenic activities such as fossil fuel burning, deforestation, non-optimal land use, etc. India is confronted with the challenges of sustaining its rapid economic growth while dealing with issues relating to local climate change.

The Indian earth observation system is continuously evolving a constellation of geo, polar and low information on creating satellites for providing data for mapping and monitoring of ecosystems.

The earth observation system also assesses atmospheric parameters on temporal and spatial scales for calibrating and validating the processes of the synoptic scale climate system.

India is also continuously augmenting ground-based observation ….. to provide initial conditions in global regional weather models for accurate global and regional weather prediction. These include the indigenously developed automatic weather stations and remit towers, Doppler weather radars, multi wave length radio meters, …… relay radar, wind profilers and GPS centres. These systems help in validating earth science data besides supporting weather and climate modelling efforts of the ISRO's geosphere, biosphere and atmospheric science programmes.

The resolution of models is being improved by expanding the observation network and up-scaling achieved by assimilation of satellite derived parameters has improved the accuracy. In addition, India has the capability of conducting multi-institutional, multi-platform, multi-parameter observational campaigns for a comprehensive understanding of the earth atmosphere ocean system.

India has carried out a few ship-air balloon ground-based campaigns over the last few years from which significant findings have emerged that can thus better understand the complexity of the problem of climate change.

Among the various studies carried out in India, a systematic approach has been adopted towards monitoring and understanding the impact of climate change in fragile and hot-spot areas. Space-based observations have been integrated with the current models to see how well they reflect the current scenario. The status of climate change indicators such as glacial retreat in the Himalayas, polar ice cover change, etc. has been well studied and documented. Mapping and monitoring the agents of climate change, mainly the greenhouse gases and studying their impacts are being pursued actively.

India has proposed to mount focused efforts in a coordinated way to study the impact of climate change by developing newer satellite sensors and by beefing up efforts in numerical climate modelling. India has already planned to launch a series of satellites such as Megatropics monitoring atmospheric …….. of humidity, temperature and precipitation in the tropical regions. INSAT 3D and …… for treating(?) water vapour, wind and temperature, SARAL for sea surface altimetry and small satellites for measuring aerosols and freezer gases. The satellite will carry advanced payloads developed indigenously and through international cooperation.

These satellites would enhance India's capability to enter the challenges of the environment and also its social and economic issues.

Recognizing the importance of climate change, the Government of India has identified a national action plan on climate change specifically identifying eight technology missions, mainly that of sustainable habitat, water mission, the ecosystem, greening India, sustainable agriculture, strategic knowledge, solar mission and enhanced energy efficiency. Considering the focus of research on climate change, India is enabling an institutional mechanism to carry out comprehensive research on climate and the environment, using space and ground observation assays.

The deliberations under this agenda item would certainly pave the way for a better understanding of the climate system and involve several projects through international cooperation. India is looking forward to joining hands with member countries to evolve a unified approach to address the global common problem of climate change that is bound to affect all humankind.

Thank you, Mr. Chairman.

The CHAIRMAN: I thank the distinguished representative of India for her statement.

The next speaker on my list is the distinguished representative of Japan, Professor Yasushi Horikawa.

Mr. HORIKAWA (Japan)**:** Thank you, Mr. Chairman.

Mr. Chairman, distinguished delegates, on behalf of the Japanese delegation I am pleased to have the opportunity to address these topics at this session of COPUOS.

Climate change is an urgent global issue that all countries, developing or developed, face. It can threaten human security across borders. Because of that, it is necessary to unite all countries to strive with this matter. Japan definitely takes a proactive stance on this issue.

Last September, our former Prime Minister, Mr. Hatoyama, announced at the United Nations Summit on Climate Change that Japan would aim to reduce its emissions by 2020 to 25 per cent below the 1990 level and Japan was prepared to provide more financial and technical assistance than in the past, in accordance with the progress of the international negotiations. Concerning contributions and the issue of global climate change and other global environmental issues by earth observation satellite, Japan has played a leading role in the establishment of group earth observation, GEO.

In the next step Japan, together with the help of international cooperation, intends to implement the observation of greenhouse gases, climate change and global water saturation monitoring by working to establish the global earth observation systems (GEOs).

Last November, JAXA was formally inaugurated as the Chairman of the implementation team of the Committee on Earth Observation Satellites, CEOS, which is contributing to developing the space-based station for CEOS. In addition, as the Chair initiative, JAXA hosted the 625th meeting of SIT(?) and the symposium of expectations to the climate change monitoring using earth observation satellite last April, supported by NASA and NOAA. Eighteen countries and six international agencies participated in this symposium. Japan has been playing a leading role mainly in working on the priority items of CEOS such as greenhouse gases monitoring from space and forest carbon tracking.

Mr. Chairman, now I will introduce some examples of Japan's efforts in addressing this issue. First, the greenhouse gases monitoring from space meant to prevent global warming and reduce greenhouse gas emissions such as carbon dioxide, CO_2, was agreed to at the Kyoto Protocol.

Before IBUKI we did not have the means to measure the concentration distribution of greenhouse gases globally and accurately, and there were only about 250 ground observing points in the world. The greenhouse gases observing satellite GOSAT, or IBUKI, the joint mission of the Ministry of the Environment, the National Institute for Environmental Studies and JAXA launched in January 2009 can accurately observe the concentration distribution of global greenhouse gases in the atmosphere by taking measurements in 56,000 spots of almost the entire surface of the earth every three days with high precision sensors.

We began to provide the IBUKI data to the general public for free this February after the concentration of carbon dioxide, CO_2 and methane were officially validated. In addition, around this summer we will also distribute the CO_2 concentration data validated jointly with a United States team as well

as the initial analysis of netflax(?), in other words towards the balance counting the emission and absorption. We expect that this analysis will show a lower error in the NETFLAX(?) estimation than the error when the estimation is calculated using only data obtained through ground observation.

We will give a more detailed presentation about IBUKI under this agenda item today.

Secondly, I would like to explain the contribution made by satellite capability on forest and carbon tracking. In a recent discussion at UNFCCC, COP 15, the framework on reducing emissions from deforestation and degradation in developing countries called REDD, was discussed intensively. In the REDD framework it is important to develop a system of measurements reporting on base station(?) or MROB, in particular in developing countries.

The phased ……(?)..parasol on board GAICHI would be useful in monitoring the forest and land classification on the global level. Currently the evaluation research of the crustacean methodology has begun and Palissa is expected to be a major component in the ……system. Moreover, by utilizing GAICHI and IBUKI, a method to evaluate the amount of greenhouse emission has been developed and a trial detection of the forest degradation index which demonstrates the increasing concentration of CO_2 by deforestation is under way.

The goal of these activities is to contribute to the development of effective countermeasures to global warming as the next step of the Kyoto Protocol through the establishment of accurate estimation methods in the concentration and distribution of greenhouse gases which includes many contributing factors such as emissions, flow and absorption of these gases.

Mr. Chairman, I would like to introduce a Japanese mission that is contributing to addressing the issue of climate change: the global change observing mission, called GCOM, will allow long-term and ongoing observations that are essential to understanding the effect of climate change over many years. The GCOM mission consists of two series of satellite: GCOM-W for observing water saturation changes and GCOM-C for observing climate change, which will be launched in the Japanese fiscal years 2011 and 2014 respectively. The dual frequency precipitation radar, or DPR, on both the satellites for global precipitation measurement, GPM, and an international mission to be launched in Japanese fiscal year 2013 will allow us to observe a three-dimensional structure of precipitation and a droplet size distribution of rainfall area.

In addition the cloud profiling radar, CPR, to be on board the earth clouds, aerosol and radiation explorer, called EarthCARE, a joint mission of JAXA and ESA to be launched in 2013 will allow us the improvement of numerical weather forecast models by acquiring large profiles of clouds and aerosols.

Accordingly, we would like to develop satellite systems for monitoring the earth's environment following our priority area of monitoring greenhouse gases, forest and carbon tracking, water cycle change and climate change.

Mr. Chairman, lastly I would like to share the information from our efforts to facilitate the food supply in Japan. Regarding advancement in agriculture, it is possible to estimate the growth status of grains such as rice and the quality of the contents, such as protein, moisture and so on using the analysis of the satellite imagery. In this regard, operations are under way in Japan. Our next step is to improve the sophistication of farm management by improving estimation ……. The continuous satellite monitoring of agricultural production will provide important information for the farming strategy to secure food production in our country. We will continue to use this type of information.

So, Mr. Chairman, Japan intends to contribute to the advancement of food production in the Asian region by utilizing land and sea observation satellite systems for agriculture.

Thank you for your attention.

The CHAIRMAN: I thank the distinguished representative of Japan for his statement.

Is there any other delegation wishing to speak under this agenda item at this morning's meeting?

I invite the representative of Saudi Arabia.

Mr. TARABZOUNI (Saudi Arabia): Thank you.

Mr. Chairman, for Saudi Arabia, Sir, and the neighbouring countries, all located in desert areas or semi-arid areas, the phenomenon is very important indeed, and from the social point of view as well as economic it has a bearing on the daily life of our citizens. More particularly, the Kingdom of Saudi Arabia has experienced unusual change in

sandstorms, in the rainfall, and this was well beyond annual estimates. This has caused tremendous loss, human lives and property.

So we call on COPUOS to encourage international cooperation. It needs to be positive and practical, and not just theoretical, and also we call on the United Nations and on our specialized agencies, committees and international organizations as well as regional bodies, asking them to devote satellites to this particular phenomenon and to constitute satellite imagery funds that are required to study climate change and natural disasters.

Disasters are of course a problem throughout the world, but we need to identify radical solutions, and we need to hone our legislation and our assistance to activate international cooperation, also for the purpose of providing assistance to damaged areas.

Thank you, Sir.

The CHAIRMAN: I thank the distinguished representative of Saudi Arabia for his information.

Is there any other delegation wishing to speak under this agenda item at this morning's session?

I see none. We will consider our consideration of agenda item 13, Space and climate change, this afternoon.

I have a request from one country – Mexico.

Mr. CAMACHO LARA (Mexico): Thank you, Sir.

Mr. Chairperson, I do apologize because I reacted a little late in terms of the question you put when you asked if there were any additional comments.

It is not really a statement, an official statement, rather it is by way of reacting to the statement made by the distinguished representative of Saudi Arabia. He has referred to a very important item in that the Committee should take a stance and issue recommendations to facilitate the use of satellite imagery as they relate to climate change and also for the purposes of disaster management.

In some cases, and in the particular case of Mexico, one change that we are witnessing irrespective of the fact that this may be due to human activities, but something that we have noted and there are patterns that are well established, are floods, very severe flooding in the south-east areas of my country, and also droughts in northern areas of my country. This has to do with climate change and at the same time it is a source of additional disasters, sometimes producing fatalities, loss of human life, and there is always serious damage to infrastructure.

So all this is intended to support the suggestion made by the distinguished representative of Saudi Arabia in that the Committee should echo this concern, should propose specific action and possibly for us to consider the dissemination of knowledge and the understanding of available images, because there is so much available at this point in time. But the thing is, we need to know how and where it is possible to obtain such images. There is a lot available and my delegation understands this, but access to information is the issue. Where are these resources, irrespective of whether it is cost free or not?

Thank you.

The CHAIRMAN: I thank the distinguished representative of Mexico for his comments.

We will continue our consideration of agenda item 13, Space and climate change, this afternoon.

Agenda item 16 – Other matters

I would like now to begin our consideration of agenda item 16, Other matters, considering this morning the following sub-items: Organizational matters, including the request for reflecting and report: views expressed by regional groups.

Before I open the floor for statements or comments to the two non-papers, 1 and 2 before you, I would like to inform you on the plan for our continued deliberations on the sub-items under "Other matters".

Starting this afternoon we will take the issues in the following order:

(1) Continue on organizational matters and the views by regional groups if necessary;
(2) Composition of the Bureau for 2012-2013, CRP.9, 10 and 12;
(3) Membership of the Committee: application by Tunisia for membership, CRP.3;
(4) Future role and activities of the Committee;
(5) Observer status: two applications, CRP.4 and Add.1 and CRP.5 plus review of rules and procedures of granting permanent Observer status to non-governmental organizations, CRP.6;

(6) Other matters, including strategic framework for 2012-2013 and preparations for the 2011 ……..

In this regard, delegations are reminded that the strategic framework for the programme on the peaceful uses of outer space for 2012-2013 has been distributed to you in CRP.8 and document A/65/6, programme 5.

We will also discuss the proposal on the commemoration of 50th anniversary of COPUOS and the 50th anniversary of human space flight at the 44th session of COPUOS next year. CRP.13 will be distributed to you this afternoon on this matter.

Distinguished delegates, I now turn to the issue before us at this morning's meeting. First we will consider organizational matters and thereafter the report language reflecting views expressed by regional groups.

I now open the floor for comments on non-paper 1.

Is there any delegation wishing to speak or make comments on this non-paper?

Germany has the floor.

Mr. MUETZELBURG (Germany): Thank you very much, Mr. Chairman, for giving me the floor

This is just to say that my delegation welcomes the initiative taken by the Secretariat that produced this non-paper, and we can agree with most of the points and just to add a few reflections or propositions from our part.

To start with, the object of our deliberations at COPUOS: space technologies are a state-of-the-art technologies which, as we have seen under the deliberations in agenda item 10, have spin-off benefits for all technical domains of our lives. However, in our concrete deliberations here we sometimes fail to make full use of a particular electronic media which could have benefits for the efficiency of our deliberations and of course could have, as a consequence, the effect of saving costs for many delegations. I think that especially now in times of financial crisis and savings it is our obligation towards our tax payers to make such efficiencies given the conference costs of an estimated $19,000 per day.

So I would like to throw up three ideas that we would have. The first is concerning the third bullet point on the second page to give the Secretariat the full mandate to schedule the sessions, which we fully support. Concerning this, we would like to propose that agenda items could perhaps be clustered, enabling delegations to limit the presence of their experts to either week one or week two of the LSC or of the STSC which thereby would help to save costs for travel and overnights, which is interesting for all the delegations but I think especially for developing countries: this would be interesting to explore.

The second point that I would like to make is from the stronger use of electronic media and I wonder whether it would be possible perhaps to provide electronic copies of statements, especially those under the general exchange of views, to make these available to the Secretariat for posting on-line. Technically it would be possible, as far as I know, to do so immediately here from the conference room. Right now we have the situation that if you are interested in having a copy you have to physically walk over to the other delegation to request a copy. I think this could be done using modern electronic media.

And third, just to support the paragraph at the very bottom of the non-paper considering digital recordings: there I would also encourage the Secretariat and delegates to be more ambitious. Other organizations are even using the means of web-casts to transmit the deliberations to enable delegations to follow them from home, thus again saving travel costs and enabling everybody to participate better. Again this is something that should be of appeal also to developing nations.

Finally, to conclude, of course – this also concerns my own delegation – just to have an understanding of greater discipline, if we want to seek greater efficiencies we should also stick to going through the agenda, not reopen agenda points where possible, limit the speaking time and therefore I think it would be good to help the Secretariat, and so I very much welcome this initiative.

Thank you very much.

The Chairman: I thank the distinguished representative of Germany for his comments.

Is any other delegation wishing to make comments or to speak on this topic?

I call the representative of Spain and then the United Kingdom.

Spain has the floor.

Ms. ZABALA UTRILLAS (Spain): Thank you, Mr. Chairman.

Actually this is in order to state that the suggestions made by Germany have the support of European Union members.

The Chairman: Thank you very much.

The United Kingdom -

Ms. KEYTE (United Kingdom): Thank you, Mr. Chairman.

The United Kingdom would also like to welcome this non-paper by the Secretariat and the majority of the ideas within this. The United Kingdom also has ideas on how we could make the most use of our time in COPUOS and subcommittees. In this time, as Germany stated, with difficult financial pressures on all delegations, it is important that we make the most of our experts' time and of our time in meetings, and that we use the time we have set aside, so this is using all time for all sessions.

The idea we hear about giving the Secretariat full mandate to schedule the sessions with the most flexibility is very important. Perhaps by clustering agenda items, as Germany has stated, so that technical items are together, experts can approach these items and perhaps we can be more efficient in how we use experts' time, coming out for certain weeks or certain periods.

On top of the suggestion by Germany to cluster items, the United Kingdom would also suggest consideration of opening agenda items one at a time. This would allow Member States to have full discussions on one agenda item, it would allow us to focus on one agenda item at a time and prevent confusion of which items are being discussed. This would allow us, as they say, focus better on what we are discussing. It would also allow experts more idea of when items are being discussed and prevent people from having to come out for a week or two weeks when in fact they just want to be present for two agenda items.

There is one idea in the non-paper that we would actually not be so keen on, and that is the comment under bullet 2, which is to limit the number of statements applying to each meeting. Although I am in favour of making effective use and encouraging Member States to recognize the time limits for making some statements and not to repeat the opening of agenda items. We could not limit the number of statements because the statements provided would be of course the amount of Member States and Observer States sitting in the meeting at the time.

We look forward to seeing the implementation of these measures and hope that we can make this a very effective forum in the future.

Thank you.

The CHAIRMAN: I thank the distinguished representative of the United Kingdom for her intervention.

For sure we would like to cluster, we would like to open only one time the items, we would like a lot of things but it depends very much on the discipline of the delegations. You know that some delegations write their statements here at the session. They do not come with their statements from home. Since the first days we have plenty of full time. You remember the first day of the session ended before 5 p.m. So there were no speakers. If we agree on such things, of course we will respect the wish of the delegations and we will cluster, we will open the items only one time. All delegations have to know that if it is so decided, it should be respected.

Of course, now we deliberate. In the end we will include in the report your views and the COPUOS will decide.

Thank you.

France has the floor.

Mr. LEVY (France): Thank you, Mr. Chairman.

This delegation would like to support the comments made by our German, Spanish and United Kingdom colleagues. I am not going to repeat what they have already said – we fully support that. It seems to us that grouping or clustering the agenda items, apart from financial considerations which of course affect everybody, it is a matter of organization.

Many experts exist in the various capitals or space agencies who would benefit from greater visibility, greater transparency and understanding of when this or that item is raised and addressed in the course of a session, the course of the agenda. That is what other organizations do. Perhaps it depends obviously on how the discussion is structured. Often we have these sessions at the beginning of June and

they compete with other meetings here in Vienna, including the IAEA Board of Governors held at more or less the same time as the first week of this Committee session, and there are other groups such as CTBTO that also meet at this time.

The general statements pronounced by the heads of delegations seem to justify why the general debate sometimes continues over several days, but for organizational reasons and efficiency reasons, my delegation, as well as others, believes that clustering items is absolutely essential, particularly focusing on those dates when relevant experts can make a contribution.

Thank you.

The CHAIRMAN: I thank the distinguished representative of France for his intervention.

Now the distinguished representative of China has the floor.

Mr. YU XU (China): Thank you, Mr. Chairman.

The delegation of China would also like to join in to thanking the Secretariat for this non-paper, and thank the Secretariat and the Bureau for the efforts to enhance the simplicity of the COPUOS and the subcommittees.

In general China welcomes this document, as well as the ideas incorporated within it. We hope that this non-paper will serve as a starting-point for our deliberations on how to organize this Committee as well as its subcommittees.

It seems to me there are many suggestions and ideas during this session. Some of the ideas are suggested in this Secretariat paper, such as whether the general exchange of views will be over a long term or limited to one day, whether we should open all items within the course of the day and then you could have the full ideas of the topics you like to address, or you have to limit one hopefully in one session, otherwise you will be confused. Some delegations have said that.

So there are many conflicting ideas and words, which are interesting, and we should work on that. If the following session is the starting-point for us we should look at the organization of this Committee.

At this stage I have one terminal remark on the second page, the third bullet. Although we can accept that the Secretariat should have the flexibility to arrange the schedule of the session, I am a little bit worried about the terminology in that said bullet that the Secretariat should be given the full mandate to schedule the session. Legally speaking, it is up to the COPUOS meeting to decide on the agenda for the next session and how to organize the session of COPUOS, so we have no difficulty to give the flexibility to give discretion to the Secretariat to make changes. I am sure we are ready to give the Secretariat full mandate to look at the respective sessions of the COPUOS.

Although some items may be given more time than others because it depends on the merits of the item, I do not think we should base it on the need to allocate, submit it in time to the working groups. Otherwise there will be encouragement to set up more working groups rather than have a full session. So we should look at the merits of the item, rather than whether we should give more time to the working groups. I would ask the Secretariat to work on that, to make improvement of the drafting. I think it is noted that the merits of that we cannot accept: the drafting should be improved.

Thank you, Mr. Chairman.

The CHAIRMAN: I thank the distinguished representative of China for his comments.

The next speaker is the distinguished representative of Chile.

Mr. ACUÑA (Chile): Good morning, Mr. Chairman. The Chilean delegation has serious doubts on the usefulness of the paper and regarding comments formulated.

Thank you.

The CHAIRMAN: I thank the distinguished representative of Chile.

The next speaker is the distinguished representative of the United States.

Mr. HIGGINS (United States): Thank you, Mr. Chairman.

My delegation welcomes the paper prepared by the Secretariat on ways of enhancing the efficiency of our Committee. As many of you aware, the United States has been a strong supporter over the years of seeking better ways to organize our work.

I am particularly interested in paragraph 7, where we might consider how we use the transcripts,

the recorded transcripts, and I think this is something we should look at next year because you see in the Secretariat's paper that the biggest expense is documentation, and I think the recording and transcribing of the proceedings of the Plenary as well as the legal subcommittee involves a considerable amount of money, so we may want to take a look at that next year.

I just wanted to be clear that there is a certain practice that we instituted in the thirty-eighth session of the Committee which is appending to the agenda an indicative schedule of work, and I call delegations' attention to page 13 of document L/276 which is the agenda with the indicative schedule of work. In that indicative schedule it shows when each agenda item is notionally going to be taken up. In my experience there has never been a radical change in when these items are taken up. So we find that particular indicative schedule quite useful in terms of our preparations for the meetings and when we want experts here or not. So I would encourage that the Secretariat continue its practice of putting together an indicative schedule which is appended to the agenda.

The second practice that we find quite useful that the Secretariat undertakes is the daily publishing of the journal which tells us that day what items will be taken up each in the morning and in the afternoon session, so that is a more refined schedule than the indicative schedule because it takes into account the flow of the meeting, but we find that to be quite useful as well.

Thank you, Mr. Chairman.

The CHAIRMAN: I thank the distinguished representative of the United States of America for his comments.

We will continue our consideration of agenda item 16, Other matters, this afternoon.

Distinguished delegates, I would now like to give the floor to Ms. Bernadette Weinzierl of Germany for her presentation entitled "Volcanic ash layers over Europe, Air-borne observations with the DLR Falcon research aircraft in April-May 2010". We have four technical presentations which should finish in time.

So, the screen for the technical presentation, please. Thank you.

Ms. WEINZEIRL (Germany): Thank you for the introduction. I want to report on our measurements in volcanic ash layers over Europe, the measurements with the DLR Falcon research aircraft.

The volcano in Iceland – it erupted in March, but this eruption was not very strong and on 14 April a really strong eruption occurred and part of this aerosol was transported into Europe. This slide here shows you distribution of ash in the ten days after this eruption on 14 April, and you can see that half of the northern hemisphere is covered by volcanic ash from the Eyjafjallajokull volcano.

So the question is, is it dangerous for aircraft to fly in volcanic ash layers and why is it dangerous. There are several effects, there are the sand blast effects which can destroy cockpit windows, then the jet engines can be affected by silicates which melt in the engines which clog holes and which can even blow out the engine. Also the sensors which show you the altitude of the aircraft can get clogged and the problems that this has on aviation, the real hazards, depend on the ash concentration in the air, on the engine type, on the flight altitude. In April 2010 there were no threshold values accepted for safe air traffic.

So these are now Lidar measurements which were taken at the ground by the University of Munich. The measurements started on Friday, 16 April and at midnight you can see a layer of aerosols in red colour shown at 5 kilometres altitude. This layer goes down, and on the 17th it was in the boundary layer, and this layer is the volcanic ash which led to the closure of the airspace.

On 19 April the red area shows the area where no aircraft was allowed to fly, and this closure of the airspace raised several questions. People were asking is it justified or is it exaggerated, how good are the forecasts? Is the volcanic ash comparable to Saharan dust, because a lot of aircraft are flying in Saharan dust layers? Which threshold values should be used and how can the decision process be improved if the airspace has to be closed or not? And for us scientists it was also interesting to know what the Lidar instruments in the satellite could see, how is the ash composed, which kind of particles do I have, what is the chemical composition. To answer all these questions, an aircraft like the DLR 500 research aircraft can help.

This is a picture of the aircraft and the arrows show you the instruments which were integrated for our measurements. So we had a lot of instruments in the cabin for aerosol and trace dust measurements, for example, we were measuring SO_2 and particle

composition, but we also had instruments for large particles. We had Lidar instruments which allowed us to fly over the ash cloud and look into the ash cloud and then decide whether it was dangerous to go into the ash cloud and take in situ measurements or whether it would be better to stay outside the cloud.

There was a lot of criticism that it took too long to get the aircraft into the air, but I have to say that the aircraft was empty on Friday and it normally takes about two weeks to create the instruments. These are a few pictures showing the integration, and for the volcanic ash survey we did the integration within three days, which is quite fast.

This is now a map showing all our flights. Altogether we did 17 flights. We flew over Germany, over northern Europe and we also went to Iceland and did some surveys there.

Now I want to show you a few slides from measurements which we did on 19 April, which was our first flight. Here on the slide we can see colour-coded by Lidar profile. Blue areas show you areas where there was no aerosol, then the yellow layer is the layer where volcanic ash was present. As can be seen on this picture there was volcanic ash all over Europe. In Munich the layer was about 500 metres deep and over Leipzig it was even 2 kilometres deep.

Now if you look at this area here, I will show you more measurements. The ash was not only visible in the Lidar, you could also see it by eye, so in this brownish layer is the volcanic ash over Leipzig.

The picture on the left is a vertical profile of a ground-based Lidar system. The red area is the boundary layer which goes up to an altitude of 2 kilometres and between 4 and 6 kilometres there is a yellow area, which was the ash layer. With our aircraft we decided to go down into the ash layer to take in situ measurements and the black crosses show you the areas where we did a lot of sampling.

This is now vertical profiles of particle number concentrations, the blue curve is particles larger than 3 micrometres and the ones which are thought to be dangerous for the aircraft. The green curve is particles between 0.1 and 0.5 micrometres, and the red and black curve is between 10 nanometres and 2 micrometres. It is interesting in the area where you have this ash layer in the Lidar also the number concentration of the particles is enhanced. We calculated the mass for this layer and it was around 100 micrograms per cubic metre on the 19th.

I already mentioned that we also went to Iceland, and this is a picture taken on 29 April. The volcano looks very quiet on this picture, but it looked totally different on the next day, so you can see this really black plume coming up from the volcano. On this day we decided to do only Lidar measurements because we expected the concentrations to be far too high to go into it with the aircraft.

Here are just a few pictures showing you the plume on 1 May and we decided to do in situ measurements not close to the volcano but at a distance of about 500 kilometres away from the volcano.

This is now a Lidar plot taken 500 kilometres away from the plume on 2 May and in red you can see a really thick plume here which has a depth of about 3 kilometres and a width of about 70 kilometres. It was clear to us that the concentration was not as high at the top of the plume as it was within the plume, so we decided to do in situ measurements but only in this area here.

This now shows you particle number concentrations and the yellow area shows you the area where we were in the plume and the particle number concentration increased by a factor of about 1,000 when we went into the plume. Also the particle concentration of the particles larger than 3 micrometres was very high.

These are a few ostar electron microscopic pictures which we analysed from the samples we took in the plume. We stayed for only three minutes in the plume because the concentrations were so high. The question was, how high was the mass in this plume. To calculate the mass, we need to first drive particle size distribution from our measurements, which is shown here. On the x axis it shows the particle diameter and on the y axis it shows the concentration. It is interesting we did not find particles larger than 30 micrometres, so the question was, what happened to those particles.

On this plot I calculated the settling distance, and in the top of the plume the particles are so heavy that they settle within seven hours, so you would really not expect particles larger than 30 microns in this area.

So if you now want to calculate mass from optical measurements you have to assume a refractive index. Depending on the refractive index you get different mass concentrations, so if you assume that the particles do not absorb light, then we get a mass of about 1.2 milligrams and if you assume that the

particles absorb light a little bit, then you get concentrations of about 10 milligrams.

So the question was, were there more particles in the air than in Sahara dust. This plot shows you a vertical profile of flights which took over the Sahara. The blue line is the medium concentration over 17 flights over the Sahara, and the red dots show the measurements over Leipzig and over the North Atlantic. As you can see, the concentration was much higher than in the Saharan dust plumes. Also, if you look at the aerosols' optical depth, which is a measure for the number of aerosol particles in the air, then you can see during the ash cloud period over Germany the optical depth was around 1 and over the Sahara it was only between 0.4 and 0.6, so it was about a factor of two higher during the ash clouds event.

We had a lot of measurements, so I want to show you just a few pictures. We had one flight on 9 May where the concentration was only 10 milligrams, and we had a flight on 13 May over the English Channel. This plume was not predicted by the volcanic ash centre model, but you can not only see it in the data but also on the picture. Then we had a very heavy plume on 16 May and we had also measurements on 17 May, so this is a satellite image. The yellow area shows you an area where we have volcanic ash and the green line is the flight track of the Falcon aircraft. This is a picture taken during the flight and the greyish area is the volcanic ash layer, so it was visible by eye. This is the corresponding Lidar image and you can see in the area over the North Atlantic, over the North Sea, the reddish area shows you very high concentrations.

So, what are our conclusions? We had 17 flights between 19 April and 18 May. We used satellite data, ground-based Lidar and model predictions and we have many scientific results. We did not find particles larger than 30 micrometres, they were composed mainly of silicates and ammonium sulphate but they had more natrium and calium than Saharan dust particles. We had mass loadings below and over this new threshold value and we stayed for one hour in concentrations of 450 micrograms per cubic metre without engine damage. The SO_2 values were between 4 and 200 ……. The airspace closure over mid-Europe on 17 April was justified, then the ash loads started to age and to decrease. The airspace closure on 9 May is questionable. The closure over the United Kingdom on 16 May was fully justified because the concentrations were so high. The quality of the forecast is reliable enough for aviation and fresh and heavy volcanic ashes were predictable, but if it ages it is far more difficult for anyone to predict it correctly.

Since every week on average a volcano erupts we can get into the same situation soon, so for the future we need to improve the link between the operations and the academia and we need to continue the operations with the DLR Falcon as an emergency aircraft.

Thank you for your attention.

The CHAIRMAN: I thank the distinguished representative of Germany for her presentation. I think the presentation – it is very proper to be done in the framework of the International Civil Aviation Organization as well, because it deals with atmosphere remaining in the air space, but as long as the ash affected us all during the last months, it was very interesting to listen to this presentation.

Are there any comments or questions? I see none.

The second presentation that we will hear this morning is by Mr. Horikawa of Japan, who will give a presentation entitled "Mission status and endurance status of GOSAT IBUKI".

Mr. HORIKAWA (Japan)**:** Thank you, Mr. Chairman.

Distinguished delegates, I am pleased to be making a presentation on GOSAT mission objectives and the current status of GOSAT.

I would like to start with the history of the GOSAT project. As you know, in 1997 the Kyoto Protocol was adopted at COP 3. Later, in 1999, the GCOM-A 1 mission study was begun in Japan. The purpose of GCOM-A 1 was to research atmospheric chemistry and to observe the atmosphere using the …… calibration missile(?). In 2002, the Japanese Government ratified the Kyoto Protocol. Soon after, societal concerns with the global environment and global warming grew sharply. As mentioned in the Kyoto Protocol, continuation and acceleration of the development of systematic observation was necessary. As a result, JAXA decided to change the purpose of GCOM-A 1 from researching atmospheric chemistry to contributing to the administration or management of the environment. The name was also changed from GCOM-A 1 to GOSAT.

In 2005, development of GOSAT began. GOSAT stands for greenhouse gases observing satellite. Its nickname is IBUKI, which means "breath" in Japanese. The objective of GOSAT is to observe

carbon dioxide and discern ground density with a relative accuracy of 1 per cent for carbon dioxide and 2 per cent for methane at a spatial scale of 1,000 km^2 and in three months averages. The mission target is to reduce the estimation error of sub-continental scale carbon dioxide annual effects by half. The photo of the GOSAT flight model on the right-hand side of the figure was taken at the launch site. GOSAT was launched successfully on 23 January last year.

GOSAT has two main mission instruments, collectively called TANSO. The Fourier transform spectrometer, FTS, is a main mission instrument and observes greenhouse gases. The FTS has two access pointing mirrors for ground pointing, calibration(?) and image motion compensation. The right-hand side of the FTS is capable of pointing in a range of ± 35 in the cross-track direction and degrees in the ± 20 in the along-track direction. The ……..field of view is 10.5 kilometres and it takes 4 second to acquire one interferogram. The FTS observes a wavelength vision of the near infrared short-wave infrared and summer infrared.

The other mission instrument is the cloud and aerosol imager, called CAI. CAI data are used to counter-balance the data of FTS. The CAI has four observation bands in ultraviolet red, near infrared and short-wave infrared. The IFOV is 1,500 metres in short-wave infrared band and 500 metres in the three other bands. The FOV is 750 kilometres in the short-wave infrared band and kilometres in the three other bands.

GOSAT is a joint project of JAXA, the Ministry of the Environment and the National Institute for Environmental Studies, NIES. JAXA is responsible for the development of the satellite, including mission instruments, and on orbit operations and data calculation and level 1 data processing. JAXA also performs the radiometric and geometric calculations. The NIES provides algorithms for development, level 2 or higher data processing and validation. Data are distributed by both JAXA and the NIES. The Ministry of the Environment developed one of the mission instruments to share the costs and uses GOSAT data for their environmental administration.

GOSAT usually observes agreed points, such as those on the left of the figure. The yellow dots show the observation points. Usually GOSAT observes five points in the cross-track direction and is capable of increasing the number of observation points to nine in the cross-track direction. GOSAT can observe specific points requested by users in addition to the agreed points. When GOSAT observes the specific points, the nominal agreed points in the corresponding area are replaced with the specific points.

The observation mode also transitions from agreed observation mode to a specific mode, specific point observation and back to agreed observation mode. Since the reflectance of the sea surface is rather low, so GOSAC observes sun glint over the ocean. When sun glint is observed the specific observation mode is used.

After the GOSAT was launched, the initial functions were checked and initial calibration and validation were completed and progress to the nominal operation phase. Design mission life is five years so the nominal operation phase will finish at the end of January 2014 and will then move to the extra-operation phase.

On 23 April of last year we started the distribution of spectral data to pre….. investigators and on the distribution of carbon and methane column density. We started distributing spectral data to public users on 30 October and on column density on 18 February of this year.

The lower figure shows the variability of the mode fraction data. The standard deviation of this variability is 4.1 ppm, so the relative accuracy of one observation data is about 1 per cent. There are 100 to 300 samples in an area of 1,000 km x 1,000 km and for three months, so the relative accuracy of the …….. in the 1,000 kilometre special scale and over three months becomes 0.06 per cent to 0.1 per cent. However, GOSAT data has some biases and the …….. is approximately 8 to 10 ppm lower than the validation data acquired by the ground measurement system. We are currently studying the cause of this bias and the method to reduce this.

GOSAT began observation in April of last year and since then we have acquired lots of data. This map shows the monthly average data of the carbon dioxide column average dry mole fraction. There is no data for May because we have halted observation to investigate an anomaly in the sensor, the unstable mirror behaviour. We adjusted the control parameters of the mirror and it is working without problem now.

The high concentration in Africa is supposedly an error due to the sand over desert. We can see the low concentration in July and August in the northern hemisphere that is due to the photonic synthesis of the base station. The area where the …… to load ratio of the observation data is low was when the elevation angle of the sun was less than 20°. The data are not processed because the results have

many errors and the area is covered by cloud so it is impossible to calculate the concentration. Therefore, the data in the high latitude region of the northern hemisphere in the winter season were not processed.

As previously mentioned, GOSAT observes sun glint over the ocean and the region of sun glint is 20° north and south of the south solar point. These maps show the monthly average data of methane for an average dry air mole fraction. The processing condition of the data is the same as the condition of the carbon dioxide data. The trend that northern hemisphere methane concentration is higher than the southern hemisphere concentration throughout the year is consistent with the results of the ground observation.

We are cooperating with the United States ACOS Scheme in regard to the calibration and validation. ACOS stands for atmospheric CO_2 observations from space and many people are participating in this scheme. In June of last year, the GOSAT and ACOS team jointly performed vicarious calibration in Railroad Valley and we will do the same in Railroad Valley this month.

All GOSAT level 1B data, that is spectral data, are being sent to JPL every day and the ACOS processing it into level 2 data by using a portion of those data. These maps show the carbon dioxide ground average dry air mole fraction for each season, processed by the ACOS team. The variability provided by the ACOS team is up to 6 ppm higher that the one processed in Japan because of the difference of the algorithms and the collection method for the aerosol effects.

The CAI observes aerosols to counterbalance the FTS data. Through this function, CAI has the observation bands in ultraviolet red, near infrared and short-wave infrared. About one and a half months ago a volcano erupted in Iceland. The CAI took a picture of the spreading ash cloud. The upper left image was taken on 15 April and the one in the upper right is an enlargement of the region in the left image with ash cloud. The yellow part shows the spreading ash cloud. The ash cloud from a volcano absorbs the ultraviolet and reflects the red and near infrared rays so by comparing the intensity of the ultraviolet band to the one of red or near infrared band, the ash cloud can be identified. The colour of the ash cloud is not actually yellow. The lower left image was taken the next day and the one next to it is an enlargement of the region with ash cloud.

GOSAT data are now open to the public. Anyone who has an email address can access the GOSAT data. This is the top page of the GOSAT website operated by the NIES. If we want to access GOSAT data, click here, you will move to this page and you may choose the item from this menu. If you want to see the concentration map, in this case you do not need to register. If you want to know the digit value of the concentration, click here and register. This year we are considering several aspects of the data besides the concentration. This summer we will release the first analysis results of the net facts (?) of carbon dioxide and if possible we would like to show at COPUOS 16 or elsewhere that data acquired by satellite are useful for verifying increases and decreases in carbon dioxide concentrations.

So, in concluding, up to now a year's worth of data has been accumulated. The ……. Calibration and validation were completed and it was achieved with a relative accuracy of 1 per cent for carbon dioxide and 2 per cent for methane. GOSAT data have several numbers of biases and the method to reduce this bias is under research. When there are particles such as the sun over the desert then the result of the retriever becomes large. From now on, the monthly data will be compared with the one of the same month from the previous year. We would like to see the satellite data utilized for environment management and administration of the …….

Mr. Chairman, thank you for your attention.

The CHAIRMAN: Thank you, Mr. Horikawa, for your presentation.

Are there any questions or comments? I see none.

The third presentation for this morning will be made by Mr. Hegde of India who will make the presentation entitled "OCEANSAT-II meeting global demand".

Mr. HEGDE (India): Thank you, Mr. Chairman. I would just like to give an update on the OCEANSAT-II mission, how we are trying to meet the global data demand to this august gathering.

As some of you are aware, OCEANSAT II was launched on 23 September 2009 and this was the successful flight of our own large vehicle PSLV. It was of course a perfect launch, it is a 956 kg satellite and 720 kilometres sun-synchronous orbit. It is a global mission configured to cover the global oceans, provide continuity to ocean colour data with global wind vector, and also characterization of the lower ionosphere and atmosphere. The instruments on board

are an eight-band colour monitor with 360-metre spatial resolution. It has a Ku-band Pencil Beam Scatterometer with a ground resolution of 50 x 50 km and it also has a radio occultation sounder for atmospheric studies developed by the Italian Space Agency and the applications are of course potential fishing zones advisories, ocean state forecasting and ocean and coastal studies.

You can see on the left side the local area coverage, the ocean colour monitor data at 360 metres spatial designation. We acquire it and transport it on real time. For the global area coverage we have 1 km and 4 km mode observation. We have recorded on board and play back when it is in the visibility of an appropriate ground station.

Data for the OCM ocean colour monitor are level 1 pro-data products, level 1B radiance products, level 1C radiometric and geometrically …… products and at level 2 we derive the geophysical parameters, the products chlorophyll A concentration, total suspended matter, diffused …….. coefficients and also aerosol optical depth. On the right side we can see the OCEANS2 data products for chlorophyll and the aerosol optical depth, and level 3 we have wind products which we globally distribute on the web at 4 km resolution weekly, monthly and on a yearly basis.

These are the eight spectral bands from 422 nanometres to 845. The first five bands are in 20-nanometres band width. The sixth band has got 30, the seventh band is 30 nanometres band width and the last one has 40 nanometres and width. Of course you can do various colour compositions into forced colour or somewhat natural colour by a 653 combination.

Now the OCEANS2 local area coded data is downloaded for the Indian and international ground stations in the United States, South Korea, Europe, Malaysia, Thailand and Australia and the OCEAN data products, especially the potential fishing zone product, is distributed to the Indian fishing community with a three-hour data download.

Now, OCEAN-II is a part of the working constellation of satellites on ocean colour radiometry (OCR) under the CEOS. I think this is gathering everywhere. India is also an active partner in the CEOS. For the scatterometer data products we have level 2A we have …….data 50 x 50 kilometres with selected users. Level 2B is the wind vector for each orbit, again 50 x 50 kilometres square. We give it to global users through the Web. Level 3 is …….. global, 0.5° x 0.5°, global users can get through the Web, and Level 3 wind vector data, again 0.5° x 0.5°, to global users through the Web.

So we have OCEANS2 scatterometer which is part of the working constellation on ocean surface wind vector under the …….. and on the right side we will see a typical product of 10 November 2009 when we had the cyclones.

So towards specifically meeting the global requirements within the stipulated time of say 180 minutes, how we acquire the data is illustrated here. We have plans to download the data on …… for every orbit in two minutes and transfer of data will take place to our ground receiving station at Hyderabad in south-central India using an exclusive high-speed communication link of 45 bpms within two minutes. Data processing generation will take place within 25 minutes and the level 2 data products for wind vector are unloaded in the analysis web port within 153 minutes of acquisition and the same data products will be disseminated to EUMETSAT, …….., wire ….. data exchange base at through the 45 bpms link in the next five to seven minutes. Subsequently it will also be uploaded to EUMETSAT for dissemination to EUMET sites in Europe, the United States and South Africa within 160 minutes. The data is also disseminated to NASA NOAA from EUMETSAT via the same link.

So this whole arrangement will be in place in the next couple of months and we have reached appropriate understanding with EUMETSAT to implement this scheme at the earliest, and as you can see we are a big part of the constellation for OCM 2. Of course, we have also planned to have the OCM 3 in the 2013 timeframe which will go up to 2018 or so. But this OCM 3 could just be an OCM. As of now, we have not planned to put the scatterometer along with that, it could be a separate mission,

For the OCEANSAT phase vectoring mission, again of course we have the OCEANSAT II in place as we had planned, and this is how, distinguished participants, we try to be a part of the global demand for an ocean colour monitor data, as well as the ocean surface wind vector data.

Thank you, Mr. Chairman.

The CHAIRMAN: Thank you, Mr. Hegde, for your presentation.

Are there any questions or comments? I see none.

The fourth presentation this morning comprises a video and a presentation by Japan on the re-entry of HAYABUSA on 13 June 2010. I give the floor to Mr. Otake.

Mr. OTAKE (Japan): Thank you very much, Mr. Chairman.

Mr. Chairman, distinguished delegates, it is my great honour to report by video the triumphs of coming home at COPUOS. I would like to show you two short videos, two films, of HAYABUSA and several pictures taken the day before yesterday. The first film has subtitles in English, the English text …… pause, so we would like to ask the interpreters kindly to help as much as possible.

[Film starts, in Japanese].

The next video, please.

[Film starts, in Japanese].

This is computer graphics … [inaudible because of music].

[…and to go to Itokawa. We are now approaching Itokawa. (inaudible) and the first person in Itokawa … and some sensors from the Itokawa surface, landing at Itokawa. This is getting the sample – it is not well done but we expect some ….. in the capsule. Small sensors in the ….. in Itokawa and …..].

Thank you. I am now ready to show you some pictures, real pictures, not computer graphics.

This is the HAYABUSA. You can see the size if you compare it with the man next to the HAYABUSA. It was pictured on 9 May 2003.

And this is a map: the landing spot is 500 kilometres from Adelaide, the Australian city. And this is a photograph of the sky and you can see the trajectory of the HAYABUSA entry. This is taken in a little ….. in Australia. A great fire was here. And later I guess we will show you some news videos. The high atmospheric service dissolved at this atmosphere, but the capsule itself separated and re-entered safely.

This is the news. You can see this is the insulation of the …….the small dot just below the fire ball, and this is the sample capsule. Over there was the peninsula (?) of India. Very impressing news and it is broadcast in Japan. So, helicopters serving the landed capsule. This is at midnight but the helicopter could find the capsule and its parachute there.

This is the next day, morning, and our staff approaches the capsule. This is for confirmation, and there was no serious damage of the capsule.

These are the people from JAXA: Dr. Kawaguchi is smiling here. He is the project manager of this long project. There were so many fans coming to our …… campus to see this, this re-entry.

I would like to express my sincere appreciation to all related persons, organizations and nations which support, encourage and collaborated in the project to make it possible.

Regarding the postponement of the presentation from yesterday to today, Mr. Chairman requested to add more value to our presentation such as showing some samples today. Unfortunately, as I mentioned, the capsule is under transportation to Japan and it will arrive Friday at ……. Campus.

Instead we have one additional information under the project as a bonus. Mr. Chairman, all of the participants may know the small solar power sail demonstrator, Ikaros. It was launched on 21 May and safely travelled to Venus. The key attempt is to open the sail successfully. Here we show you the envious first picture taken by the camera separated from Ikaros and the solar sail fully opened. Now you can see the sail with a size of 20 metres by 20 metres wide, with a thickness of 7.5 micron. We expect this smaller sail boat to be a trigger to open the new possibility of space travel. We appreciate the support and cooperation and also encouragement of people.

Thank you very much for your attention.

The CHAIRMAN: Thank you, Mr. Otake, for your presentation. I am pleased that from yesterday you had fresh pictures from the recovery of the capsule.

Are there any questions or comments? I see none.

Distinguished delegates, I will shortly adjourn this meeting of the Committee. Before doing so, I would like to information of the schedule for this afternoon. We will reconvene promptly at 3 p.m. and that time we will continue our consideration of budget item 14, Use of space technology in the United Nations system. We will begin our consideration of budget item 15, Use of special data for sustainable development, and we will continue agenda item 16, Other matters. This afternoon there will be two

technical presentations, the first one by the Space Generation Advisory Council, entitled "Recommendations for the Space Generation Congress. Input from of space sector leaders on the development of space", and the second one by China, entitled "Global Flora Conference".

We therefore expect to have more time to resume our debate on other matters this morning and also to address how the use of regional groups should be reflected in our report.

Are there any questions or comments on this proposed schedule? I see none.

I have two announcements, distinguished delegates. Pleases note that the Secretariat will be finalizing the list of participants this afternoon.

If you should still need to provide changes and corrections, please ensure that these are handed into the Secretariat by no later than 4 p.m. this afternoon.

The second announcement, distinguished delegates, is with regard to the organization of the International Astronautical Congress to be held from 27 September to 1 October 2010 in Prague, Czech Republic. The Czech Space office and the Permanent Mission of the Czech Republic to the United Nations in Vienna kindly invite you to attend the presentation of the 61st Congress. The presentation will take place today at 1 p.m. to 1.30 p.m. in room M7, so downstairs in room M7.

I remind you of this evening's reception by Germany.

This meeting is now adjourned till 3 p.m. this afternoon.

The meeting adjourned at 12.53 p.m.